Exploring Culturally Relevant Feedback to African American Students in Mathematics

Submitted by

Tonya Renee Strozier

A Dissertation Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

Grand Canyon University

Phoenix, Arizona

March 4, 2022

GRAND CANYON UNIVERSITY

Exploring Culturally Relevant Feedback to African American Students in Mathematics

by

Tonya Renee Strozier

Successfully Defended and Approved by All Dissertation Committee Members

February 11, 2022
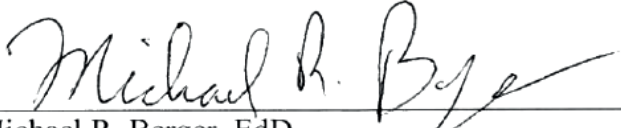
DISSERTATION COMMITTEE APPROVAL:

The following committee members certify they have read and approve this dissertation and deem it fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy in General Psychology.

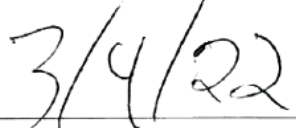Scott Greenberger, EdD, Dissertation Chair

Victor Landry, PhD, Committee Member

Kelly Maguire, EdD, Committee Member

ACCEPTED AND SIGNED:

_____   _____
Michael R. Berger, EdD   Date
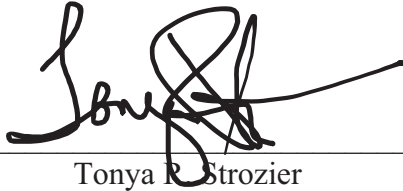Dean, College of Doctoral Studies

3/4/22

GRAND CANYON UNIVERSITY

Exploring Culturally Relevant Feedback to African American Students in Mathematics

I verify that my dissertation represents original research, is not falsified, or plagiarized, and that I accurately reported, cited, and referenced all sources within this manuscript in strict compliance with APA and Grand Canyon University (GCU) guidelines. I also verify my dissertation complies with the approval(s) granted for this research investigation by GCU Institutional Review Board (IRB).

_____   _____

Tonya R. Strozier   2/11/2022

          Date

Abstract

Teacher feedback has a strong correlation to math achievement. However, teachers need to be conscious of the type of feedback given to students during math instruction. Scholars suggest studying teachers knowledgeable of cultural relevant pedagogy (CRP) could supply models for teaching and learning especially for historically marginalized groups of students such as African Americans. Researchers further suggest a need to describe what teacher feedback to students looks like and how it is delivered. Using a qualitative descriptive study and culturally relevant pedagogy theory, the study explores how Arizona elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students. And how culturally relevant pedagogy is used in providing feedback specifically to African American third through fifth grade elementary students during math instruction. Semi- structured interviews, with 13 culturally relevant teachers and a focus group of four additional teachers, was used to collect data. Braun and Clarke's thematic analysis was used for data analysis. The findings of the study suggest culturally relevant teachers: (a) develop subskills in cultural competence, critical consciousness, and academic success, (b) development includes a teacher disposition for CRP teacher praxis (c) development is primarily sourced by teacher self-initiated strategies, (d) employ a teacher-based context of culturally relevant feedback, (e) use African American culture to provide feedback, and (f) have specific strategies to deliver corrective and disciplinary feedback to African American students during math instruction. The results highlight the importance of providing culturally relevant feedback.

Keywords: feedback, culturally relevant pedagogy, African American, mathematics

Dedication

This is dedicated to my mother, Dr. Joyce A. Morrison, and my father William C.
Morrison. Mom you inspire me in countless ways. You were there when I complained
and assured me, I could do this. Daddy you told me "you are a phoenix; you rise above
the fire." I won't forget that. I also dedicate this to my children Mark, Nissi, Tamani,
Leah, Michael, and Solomon, my granddaughter Kalyse, my sisters Antoinette "Teeda",
(I sure miss you), Dr. Tanae and Tasha, and my nephew Nasir. Thank you for your
patience when I needed to write and for the constant checks on my wellbeing and
encouragement. You celebrated every milestone with me and gave me the motivation to
keep going. I love each of you to the moon!

Acknowledgments

I want to take this opportunity to acknowledge those that have encouraged me on this journey. Nikki, you have been my sister friend for nearly 40 years. You know that I love you and appreciate all that you give to me. Mauria, you let me talk you into going on this journey with me. That's more than friendship, that's sisterhood. Thank you for reminding me to do my assignments and listening to me cry and complain. I appreciate you and can't wait to call you Dr. Mauria Terry. Thank you, Paul, for constantly telling me to pivot when I ran into obstacles. I love you. To Tee and my Holladay elementary school family, thank you for your support and letting me be a little crazy during this journey.

To my committee members Dr. Greenberger, Dr. Maguire, and Dr. Landry, thank you for challenging me and supporting me. Dr. Greenberger, I am especially grateful to you for your endless guidance and support. Thank you for the mentorship and for treating me like a scholar though I was yet becoming one.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Introduction

Every Student Succeeds Act of 2015 reauthorized the No Child Left Behind Act of 2001 with the intent of closing the achievement gap between minoritized students and White students in math and reading (Adler-Greene, 2019). Despite federal law mandates to improve math achievement, African American students continue to underperform in math compared to White students (Kuhfeld et al., 2018; Paschall et al., 2018). In 1990, White students scored higher than African American students by thirty-one points in math on a national test (Kuhfeld et al., 2018). In comparison and nearly thirty years later White students continue to score higher than African American students by twenty-five points (Kuhfeld et al., 2018). An achievement gap is a notable difference in performance between two subgroups where one group performs better than the other (Kotok, 2017). The lingering achievement gap has consequences for African American students (Battey, 2013a). For example, the underachievement of young African American males correlates with decreased graduation and low college matriculation rates (Kena et al., 2016). In addition, African American students have fewer opportunities to be successful and are more likely held back in mathematics compared to White students (Munter & Haines, 2019).

Jeynes (2015) noted limited success in closing the math achievement gap between African American students and White students and further found that the achievement gap in fact persists. In particular, the participants achievement gap is more difficult to close for elementary students compared to secondary students (Jeynes, 2015). Hanushek et al. (2019) suggested the stubborn achievement inequalities show a need to review

current policies and practices intended to close the lingering racial achievement gap. According to Wong et al. (2018) teacher instrumental support (teacher actions in the classroom) and feedback has a strong correlation to math achievement. However, teachers need to be conscious of the type of feedback given to students during math instruction (Wong et al., 2018).

Kelcey et al. (2019) noted an important relationship between teacher knowledge, instructional quality, and math achievement that were mediated by factors such as the classroom context. The goal of the Kelcey et al. (2019) study was to examine generalizable measures of instruction but the Kelcey et al. study did not examine pedagogical approaches or specific instructional practices such as teacher feedback. The amount and type of feedback a student receives plays a role in academic performance (Gjerde et al., 2018). To create effective feedback, the interactions between the feedback message, recipient, and source must be understood (Gjerde et al., 2018). To address African American math underachievement, a close examination of teacher instructional practices in the classroom (Kelcey et al., 2019) and effective pedagogy for African American students is needed.

Background of the Study

Math achievement is also attributable to earning differentials in adulthood for African American students (Battey, 2013a). Battey (2013a) noted the racialized effect of math achievement and math curriculum which acts as a gatekeeper limiting access to African American into universities. Kelcey et al. (2019) noted the relationship between teacher knowledge, instructional quality, and math achievement were mediated by factors such as the classroom context. Teachers knowledgeable of the tenets of culturally

relevant pedagogy, which is the intentional use of the student's culture as the basis for teaching and learning, foster academic achievement, cultural competence, and sociopolitical/critical consciousness (Ladson-Billings, 1995). Studying teachers knowledgeable of culturally relevant practices could supply models for teaching and learning especially for historically marginalized groups of students such as African Americans (Martell & Stevens, 2019).

There is a need to describe what teacher feedback to students looks like, how it is delivered, and how students respond to feedback (Skovholt, 2018) during math instruction from the teacher's perspective. Therefore, the purpose of this qualitative descriptive study was to explore how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona.

Exploring how teachers describe the use of their culturally relevant pedagogy in providing feedback to African American students will advance knowledge and practice by providing teachers with a detailed description of how culturally feedback is given. Knowledge will be advanced by addressing culturally relevant feedback, as a factor in the relationship between culture and math achievement (Hill, 2018). Moreover, the findings of this study advanced knowledge of teaching practices that may contribute to differences in the effectiveness of feedback on achievement, especially within the math classroom (Wong et al., 2018). The findings of this study expanded teacher knowledge and use of culturally relevant pedagogy in mathematics (Brown et al., 2018).

Definition of Terms

To provide mutual understanding and comprehension, this study involves the following terms:

Academic Achievement Gap. Academic achievement gap describes racial inequalities in the comparison of student performance on math and reading standardized assessments between White students performing better than African American, Latinx, and Asian students (Assari et al., 2021). The achievement gap has negative consequences for students of color (Battey, 2013b).

Cultural Competence. The definition of cultural competence has evolved and extends beyond an awareness of ethnically assigned, stereotypical behaviors or a static list of congruent behaviors about a group. Cultural competence is the combination of complex knowledge and skills that produces a partnership between the different cultures interacting (Garneau & Pepin, 2015). Cultural competence is not static and is applicable in multiple disciplines (Markey et al., 2020; Sinclair, 2019).

Culturally Relevant Teacher. A teacher that employs the tenets of Culturally Relevant Pedagogy (Ladson-Billings, 1995). Culturally relevant teachers seek out community and cultural knowledge and maintain a commitment to cultural integrity and collective empowerment (Williams, 2018).

Feedback. Information exchanged between teacher and student about the student's actions or understanding (Hattie & Timperley, 2007) to support learning. Carless et al. (2011) characterizes feedback as a dialogic and interactive part of pedagogy and assessment. Feedback can be corrective, an alternate strategy, and supply clarity, encouragement, and guidance in verbal and written form (Hattie & Timperley, 2007).

Math Instruction. Appropriate grade level math skills and concepts taught according to state standards (Protheroe, 2007). Most states adopted the Common Core State Standards in Mathematics that are taught during math instruction (Allensworth et al., 2021).

Noticing. The term refers to the teacher's ability to notice a student's misunderstanding and errors during the learning process (Kilic, 2018). Teacher noticing is subjective being based upon the teacher's pedagogical commitments, beliefs, and philosophy of teaching and learning (Patterson-Williams et al., 2020). Inadequate noticing skills effect student learning (Patterson-Williams et al., 2020).

Pedagogy. The process, influences upon, and inter-relationship of teaching and learning (Black & William, 2018). Teachers can include the student's culture to provide culturally inclusive pedagogy (Yu, 2018).

Social Privilege. The advantages that members of dominant social group possess based on their membership (Wu & Dunning, 2020). Social privilege is based in power which is the access and ability to access and influence over resources (Zoino-Jeannetti & Pearrow, 2020). Social privilege can be denied and instead explained as luck or inheritance (Whiting & Cutri, 2019).

Sociopolitical/Critical Consciousness. A person's ability to critically examine political, economic, and social forces that society and status in that society (Seider et al., 2018). Critical consciousness can be incorporated in a variety of classrooms (Freire, 2020) being facilitated through dialogue (Pollard, 2020). Sociopolitical/critical consciousness is characterized critical thinking, critical motivation, and critical action Lorenza (2018).

Teacher Disposition. The teacher's values, attitudes, and patterns of behavior while impacted by content and pedagogical knowledge, knowledge of students, and the sociocultural learning context (Warren, 2018). Specific teacher disposition creates a classroom environment reflecting the effect of that disposition (Stephens, 2019). Examples of teacher dispositions include empathy (Warren, 2018), putting learners first (Truscott & Stenhouse, 2018), social awareness, meekness, inclusion, and advocacy (Johnson et al., 2021).

Anticipated Limitations

Limitations in research cannot be controlled by the researcher. Low inference and small sample size are limitations of the qualitative descriptive study (Neergaard et al., 2009). Therefore, the expected limitations of the study design were research findings on CRP feedback are not transferrable and applicable across all classrooms taught by culturally relevant teachers. However, a descriptive summary of culturally relevant feedback during math instruction, from the teacher perspective, can be provided.

In addition, the study had an expected limitation based on the sources of data and sampling strategy. In depth interviews and a focus group of culturally relevant teachers were used to collect data. The anticipated limitations of the data sources were self-reported, unverifiable descriptions of how culturally relevant feedback is given to students. Furthermore, convenience sampling of teachers that use culturally relevant pedagogy is subject to a high level of bias as usage is self-reported by the participants. The researcher was not able to verify the accuracy and alignment of teacher training to the tenets of CRP. Consequently, the study findings are not applicable and transferable to all teachers that use CRP based on the anticipated limitations.

Summary and Organization of the Remainder of the Study

This chapter discussed the background and general layout of the study. Definitions were provided to mutual understanding of terms used throughout the study. There are limitations with all research. Anticipated limitations were examined to clarify the impact on transferability and applicability of the study findings. Feasibility has been considered for the study. Table 2 below describes the alignment of the study. The research is feasible based on the permissibility to Arizona Educators United and Teacher/Educator Resources and Jobs in Arizona Facebook Groups providing accessibility to participants. The researcher has completed the required CITI professional courses to conduct the study. There are limited ethical concerns related to the target population The study aligns with Doctorate in Psychology with an emphasis in Integrating, Technology, Learning, and Psychology (ITLP) degree.

Table 1.

Alignment Table

Alignment Item	Alignment Item Description
Problem Space Need:	The research that needs to be understood is how elementary teachers describe the influence of culturally relevant feedback on feedback provided to African American students in math.
Problem Statement:	It is not known how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction.
Purpose of the Study:	The purpose of this qualitative descriptive study explored how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona.
Phenomenon:	The phenomenon of interest involves how elementary teachers develop their culturally relevant pedagogy and use of their culturally relevant pedagogy in providing feedback to African American third through fifth grade elementary students during math instruction.
Research Questions:	RQ1: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students?
	RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction?
Methodology/Research Design:	The methodology is qualitative. The design is descriptive.

The next chapter presents on overview of literature related to culturally relevant pedagogy, feedback, and African American math achievement. Chapter 2 explores topics related to this study in greater detail, helping readers understand academic success, cultural competence, and sociopolitical/critical consciousness. With this background established, Chapter 3 provides an explanation of the research methodology and design, including the population, data collection, and data analysis procedures. In chapter 4, data are analyzed and provide a descriptive summary of the findings using the themes that emerged. Chapter 5 will conclude with an interpretation and discussion of the themes by

the researcher in relation the research questions. In addition, recommendations for future

studies along with implications from the data will be included in Chapter 5.

Chapter 2: Literature Review

Introduction to the Chapter and Background to the Problem

Chapter 1 provided an introduction and outline for the study. Definitions of terms are included as well as anticipated limitations. Chapter 2 provides a detailed foundation for the study. Following the chapter introduction, the background to the problem and problem space are identified. The background section provides a discussion of how the problem has evolved historically into its current state. Next, the culturally relevant pedagogy theoretical framework for the study was discussed.

Following the theoretical framework, the review of literature is divided into five major themes that describe the scope of research done in this study including: learning and culture, cultural competence, sociopolitical/critical consciousness, academic success, and feedback in mathematics. Literature was gathered from the public search engine such as Google Scholar, as well as ERIC (EBSCO), Taylor and Frances, ScienceDirect, SAGE Premier, ProQuest Education Database, and Web of Science databases provided through Grand Canyon University. The predominant search terms used were culturally relevant pedagogy, feedback, cultural competence, critical consciousness, sociopolitical consciousness, learning and culture, teacher dispositions, and teacher noticing. Empirical studies and peer reviewed articles were selected for the review of literature representing the last five years of research related to the phenomenon. Following the review of literature, a problem statement and chapter summary are provided.

Background

The focus of the study was the experiences of teachers developing their culturally relevant pedagogy in providing feedback to all students and their use of culturally

relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction. African American students have consistently underperformed on standardized math tests compared to White students (Kena et al., 2016). Research shows teacher practices, such as feedback can predict math achievement (Wong et al., 2018) yet teacher feedback can differ based on race (Scott et al., 2019). Exploring how teachers develop and use their culturally relevant pedagogy in providing feedback to African American students may provide insight using feedback to curtail low math achievement.

Extant research shows teacher feedback can vary in terms of approach, timing, and student impact. Smith et al. (2016) examined recursive dialogue between the student's internal feedback and the teacher's feedback to strengthen or weaken the student's belief in their ability to master standards. Meanwhile, Fyfe and Rittle-Johnson (2017) measured the impact of immediate, summative, or no feedback from the teacher during math practice. Gamlem et al. (2019) investigated the use of responsive pedagogy with math students resulting in a significant difference in students' feedback, self-regulated learning, self-efficacy, and achievement. Diversity of teacher feedback practices can lead to positive results for students.

Existing research on teacher feedback can be used to increase learning but does not specifically address the benefits of utilizing the combination of culture and feedback in the classroom. It is known that the teacher's use of the student's culture during math instruction can have positive effects (Hodge & Cobb, 2019). Moreover, Oxford and Gkonou (2018) argue language, learning, and culture are interconnected. Research also shows that the use of culturally relevant pedagogy creates a classroom where student

cultural identities are affirmed and results in high expectations for students (Sturdivant & Alanís, 2019), changes in student, attitudes toward and increased motivation in math (Yu, 2018) and builds and inclusive learning environment (Wynter-Hoyte et al., 2019). What still needs to be understood is how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction.

Identification of the Problem Space

The purpose of this qualitative descriptive study was to explore how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona. The problem space necessitating the study came from lack of research on how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American students.

There is a need to explore how teachers develop their culturally relevant pedagogy to provide feedback, as well as how those strategies are used to provide feedback to African American math students. Specifically, Skovholt (2018) suggested that further study was needed to better understand how teachers deliver verbal feedback, and Schuldt (2019) called for the examination of factors that influence feedback. Additionally, researchers have indicated the need to explore the math teacher's perspectives on providing feedback to African American students (Hill, 2018; Savage et

al., 2018). Also, scholars have called for further examination of culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018).

Current literature goes beyond examining the positive or negative effect of feedback on achievement. Instead, extant literature explores additional factors which may mitigate the impact of the type of feedback given and how it is provided by the teachers. Hill (2018) conducted a quantitative study with eight middle school math teachers and found math achievement of African American males was related to a variety of factors including instructional support. The purpose of the study was to examine factors impacting math achievement of African American males in middle school. Hill (2018) recommended a future qualitative study on math achievement of African American boys with interviews to gather data on teacher feedback. Additionally, there is a recommendation for a study including additional age groups (K-12) and a qualitative study where interviews are conducted to gather more data on teacher feedback. The researcher noted a limitation of not addressing factors relating to school culture with students.

Scholars indicate there is a need to examine instruction provided to African American students. Savage et al. (2018) conducted a qualitative study with five middle school teachers. The purpose of the study was to determine common practices of teachers that successfully implemented Common Core Math Standards. Using a curriculum reform, equity, and the classroom/school environment framework, the authors found that teachers with a positive orientation towards implementing rigorous math curriculum were

those with the ability to build positive teacher/student relationships to facilitate student learning. According to Savage et al. (2018) further study was needed to examine teacher practices during instruction to effectively instruct African American and Hispanic American students in mathematics. Specifically, Savage et al. (2018) recommended using interviews of teachers to create a descriptive analysis of common practices.

Feedback can be influenced by certain factors. Schuldt (2019) conducted a qualitative study with four teachers and found there were no equity issues with the distribution of feedback in terms of race and gender. However, some students received none, and those that initiate, received several minutes. Further research is needed to better understand how teachers give verbal feedback and what factors influence how feedback is given. There is a clear need to explore teacher feedback.

There is a need to examine the impact teacher feedback on students and to create a description of factors shaping feedback. Skovholt (2018) conducted a qualitative study focused on four fourth grade teachers providing oral feedback. The purpose of the study was to analyze the feedback between teacher and student. The findings of the study were that there is variation in how oral feedback is given and much of the feedback did not require the student to engage in the intellectual work because it was done for them by the teacher. Students were put in a passive learning position by the teacher's feedback (Skovholt, 2018). Skovholt (2018) stated future studies are needed to examine what feedback looks like and how it is delivered along with an exploration of the factors that shape feedback practices within individual classrooms. Limitations of the Skovholt (2018) study include the absence of the teacher's pedagogical perspective of the type of

feedback provided to students, teacher's use of the student's culture, and the study did not address mathematical content. More information is needed to better understand feedback.

The study will contribute to the body of literature by examining teacher feedback that incorporates an understanding of student culture (cultural competence) and connections to race and real-world problems (socio political/critical consciousness) (Ortiz et al., 2018) that may lead to increased math achievement (Polleck & Yarwood, 2020). The potential practical applications are that teachers may learn strategies on using feedback to increase achievement for African American students learning mathematics. In addition, teacher educators may discover how to better facilitate the development of culturally relevant pedagogy through the personal experiences shared by the participants.

Theoretical Foundations

The theoretical framework of culturally relevant pedagogy (CRP) was developed by Ladson-Billings in 1995 resulting from an ethnographic study of teachers who successfully taught African American students. The theory was developed as a response to limited research available on teaching and learning strategies that were effective with African American students (Ladson-Billings, 1995). Ladson-Billings (1997) suggested that teaching should be 1) grounded in how teachers perceive themselves, students, and parents; 2) focused on building affective connections or relationships that are equitable, fluid and community oriented within the classroom, and include the extended community (Ladson-Billings, 1995). Building from educational anthropological literature, the theory's concepts include a commitment to academic success, teacher cultural competence, and sociopolitical/critical consciousness with a goal of producing the same concepts within students (Ladson-Billings, 1995) as parts of the

teacher's pedagogical approach to successfully work with African American students. Ladson-Billings (1995) also contends student failure and subsequent achievement is within the context of a mismatch of the culturally incongruent communication between the teacher and students (Ladson-Billings, 1995). In focusing on African American culture, Ladson-Billings (1997) believed practical pedagogical strategies would be discovered. CRP empowers students emotionally, socially, politically, and academically by using culture to impart knowledge, skills, and attitudes (Ladson-Billings, 1995).

The three components of the theory work synergistically creating a context for African American student achievement.

Figure 1.

Culturally Relevant Pedagogy Theory
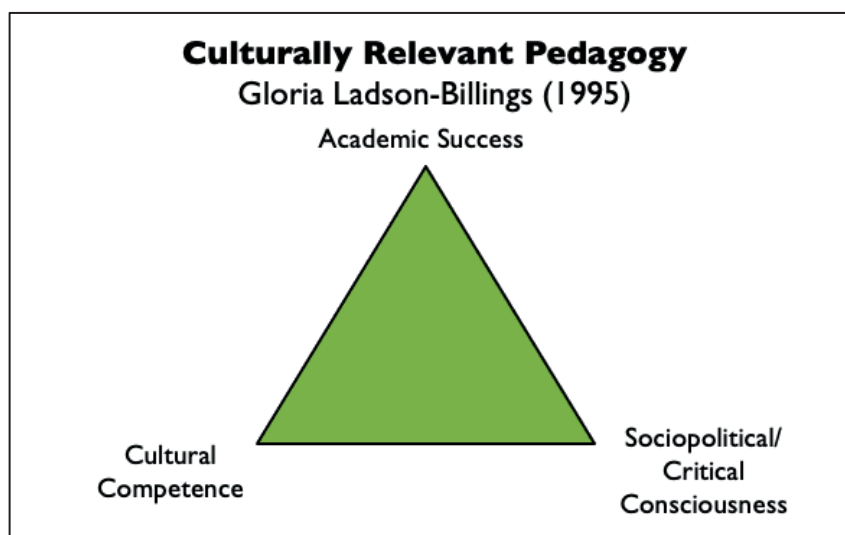
Academic success is not solely about high stakes testing rather teacher behaviors and beliefs. Ladson-Billings (1995) argues there are other ways to demonstrate knowledge and helping students to become academically successful is a teacher's primary responsibility. Furthermore, academic success should not come at the expense of

cultural and psychosocial well-being (Ladson-Billings, 1995). Culturally relevant teachers have certain beliefs and values along with meaningful relationships with students in the context of a community of learners

The teacher's use of cultural competence helps students celebrate and appreciate their culture while gaining fluency of at least one other culture (Ladson-Billings, 1995). Ladson-Billings' (1995) belief was that academic achievement and cultural competence can be merged in the classroom. Culturally competent teachers permit and encourage students to be who they are while maintaining integrity to their culture through language style, dress, and interactions (Ladson-Billings, 1995). According to CRP, teachers should also critically critique the educational system.

Through the teacher's use of critical/sociopolitical consciousness, students can learn content beyond the classroom context by applying gained knowledge to real world problems (Ladson-Billings, 1995). Both teacher and students learn to critique the status quo which is critical for African American students (Ladson-Billings, 1995). Critically conscious teachers recognize the political and societal underpinnings impacting students and within the classroom, honor the student's position and experience in society as official knowledge (Ladson-Billings, 1995). CRP can be used with specific content areas.

Culturally relevant pedagogy has been applied in mathematics. Shortly after Ladson-Billings (1997) released the culturally relevant pedagogy theory, it was applied specifically to mathematics for African American students to be successful. Tate (1995) was one of many scholars who showed the effectiveness of applying culturally relevant pedagogy to mathematics resulting in increased achievement for African American

students. Specifically, the focus was on communication between teachers, students, and the community (Tate, 1995). The study adds to the theory by exploring how teachers use culturally relevant pedagogy to supply feedback during math instruction.

The culturally relevant pedagogy theory is appropriate for the study because of the focus on minoritized students and academic achievement. Culturally relevant pedagogy impacts students emotionally and academically (Bracken & Wood, 2019). Student anxiety and stereotype threat were significantly reduced when culturally relevant images were used with college students on an ACT-like assessment measuring math and verbal abilities (Bracken & Wood, 2019).

The study will contribute to the theory by describing how elementary teachers, that use culturally relevant pedagogy, describe how they use the tenets of the theory to provide feedback to African American third through fifth grade elementary students during math instruction. The study will add to scholarship by responding to a call for further study on the use of CRP and extend into the subject of mathematics of African American students (Aronson & Laughter, 2016; Polleck & Yarwood, 2020; Twyman, 2018) and the use of a culturally inclusive approach to teaching (Yu, 2018). Exploring the teacher's development of CRP, through collecting personal experiences, can yield implications for professional development for CRP (Polleck & Yarwood, 2020) and provide additional strategies for math teachers (Twyman, 2018).

Review of the Literature

Learning and Culture in the Classroom

This theme involves an examination of the interconnectedness of learning and culture (Oxford & Gkonou, 2018), relationships and context (Osher et al., 2020), and

culture versus context (Savard & Mizoguchi, 2019). The learning and culture theme is explored relative to the study to set a context for culture in the classroom.

Learning and culture are inseparable. Oxford and Gkonou (2018) discuss the interconnections between culture, language and learning suggesting all can be taught in a united way while asserting each component cannot be separated. Within the classroom, the internal context for teachers and students is mostly culture (Savard & Mizoguchi, 2019). Savard and Mizoguchi (2019) call for a collaboration between teacher and student to take advantage of culture and context. The terms culture and context, in relation to learning, are often misused.

Context and culture are distinctly different terms. Savard and Mizoguchi (2019) confirm the terms culture and context are incorrectly used interchangeably and offer an important distinction between the terms. In the context of intelligent tutoring systems and distance education, the distinction of the terms has implications for pedagogy and learning about a variety of cultures (Savard & Mizoguchi, 2019). After an ontological inquiry was conducted, researchers found culture is used and has influence in context and the influence of that culture may vary (Savard & Mizoguchi, 2019). Moreover, context and culture are considered dynamic and evolving (Savard & Mizoguchi, 2019). Explained by Oxford and Gkonou (2018), culture is analogized as an iceberg where are the portion of the iceberg that is visible represents characteristics such as food, dress, and music. Conversely, the largest and unseen portion of culture are characteristics such as worldview, attitude, values, and power. All people are being influenced by a variety of cultures, not just one, which in turn influences how the behavior of others is interpreted

(Oxford & Gkonou, 2018). Culture is embedded within context and can be used to benefit students in the classroom.

Teachers can effectively use culture in the classroom. Hodge and Cobb (2019) present two contrasting views of culture, cultural alignment orientation and cultural participation orientation, in relation to equitable math instruction. Each orientation provides a different way of using culture to provide equitable learning opportunities in the classroom. The cultural alignment orientation consists of creating alignment between classroom math practices and the students' out-of-school cultural practices (i.e., rap) because culture is viewed as a way of life. Implications for this approach are that teachers need to learn about and then leverage practices outside of the classroom (Hodge & Cobb, 2019). Meanwhile, using cultural participation orientation, teachers investigate why students are experiencing challenges, and then subsequently develop additional supports or makes changes to the classroom activities so that all students can participate in a substantial way (Hodge & Cobb, 2019). In response to student need, teachers may use cultural alignment as an option. Cultural alignment and cultural participation orientation are contrasting views of using culture in the classroom and both options have implications for teachers.

Math instruction and culture have implications for teacher practices. According to Osher et al. (2020), teachers need to have capacity and skills around management, content, culture and emotional competence, and the ability to build culturally responsive relationships. According to Hodge and Cobb (2019), teachers adhering to cultural alignment orientation utilize home visits with parent interviews, engaging in the community, reflection, and student talk time about their lives as regular practices when

teaching mathematics. The classroom participation orientation perspective of culture implies mathematics teachers will provide more than one point of entry along with access to central mathematical ideas differentiating based on what students need (Hodge & Cobb, 2019). The authors contend that under the participation orientation, teachers must recognize themselves as cultural beings and see students in the same way. Through contrasting views, each cultural perspective has positive contributions to learning mathematics in an equitable environment. Culture is used during instruction and shapes social relationships.

Culture and context shape relationships. Challenging the nature versus nurture dichotomy, Osher et al. (2020) purports child development is a result of reciprocal relationships between biology, the brain, and physical and social contexts. The latter, social contexts, and the relationships within the context, has a substantial role in development (Osher et al., 2020). Relationships that drive positive human development are reciprocal, attuned, trustful, and culturally responsive (Osher et al., 2020). The authors note the school context can play a role in supporting positive development or conversely have a negative effect because the classroom is the most proximal location for developing relationships. To avoid causing harm to students, schools should create conditions that are culturally competent and culturally responsive (Osher et al., 2020). Culturally competent teachers are attentive to relationships and create a sense of community.

Culturally relevant teachers create culture-rich classrooms. Sturdivant and Alanís (2019) recommend teachers create a classroom community where all cultures are affirmed and to do so teacher should be aware that their beliefs, rooted in their culture,

may not be the same as the students. In the classroom environment culturally relevant teachers intentionally design instruction to include student cultures. For example, using literature with ethnicities that reflect the students, the teacher engages in authentic conversations with the students to create community by demonstrating value for the students' thoughts and opinions as well as affirming the students' contribution to the learning process (Sturdivant & Alanís, 2019). In addition, the culturally relevant texts are used to provide a context for conversations on race and ethnicity (Sturdivant & Alanís, 2019). The culturally relevant teacher validates student ideas and incorporates their interests along with the students' families into the curriculum (Sturdivant & Alanís, 2019). According to Sturdivant and Alanís (2019), an effective teacher recognizes that the students' cultural backgrounds are a legitimate source of knowledge and builds on that knowledge to form new learning for students. High expectations for students are evident by using academic language communicating an expectation for the language to be used. The teacher further communicates high expectations for using higher order questioning asking students to think critically (Sturdivant & Alanís, 2019).

In summary, learning and culture are interwoven and can be used in positive ways within the classroom (Oxford & Gkonou, 2018). Student teacher relationships are also impacted by culture. It is incumbent upon teachers to acknowledge student cultural capital in the learning space (Sturdivant & Alanís, 2019). Teachers should further recognize how culture influences individuals and learning. This theme is relevant to the study in that teachers can facilitate an equitable learning environment for students by affirming cultural identities particularly when teaching math. The reviewed literature is primarily qualitative capturing the lived experiences of the participants.

Teacher Development and Use of Cultural Competence

This theme involves an examination of the cultural competence tenet within Culturally Relevant Pedagogy (Ladson-Billings, 1995; Polleck & Yarwood, 2020). The theme is explored, relative to the study, to discuss how cultural competence is applied in education and other fields. A definition of cultural competence is examined first.

Cultural competence, though not easily conceptualized or defined, is a critical teacher interpersonal skill developed with intentional actions. Culturally competent teachers have strategies that create positive outcomes within emotional and physical environments that are conducive for all students particularly for those that are culturally and linguistically diverse (Ladson-Billings, 1995). Teachers trained on cultural competence demonstrate skilled classroom interactions and practices producing individual student and school wide benefits.

An area of disagreement among researchers is the definition of cultural competence. Cultural competence is defined as a demonstration of understanding and appreciation of cultural differences (Macqueen et al., 2020). However, culture is not limited to ethnic origins, but instead, it includes a variety of communication and interactions using the student's culture (Padua & Gonzalez Smith, 2020). Cultural competence is also defined by others as a construct used to measure attitudes, dispositions, values, beliefs, knowledge, and skills according to Johnson et al. (2021). Cram and Alkadry (2018) offer a different definition of cultural competence that includes the ability of an individual to work effectively with various cultural contexts based on awareness, knowledge, and skills. The definition is expanded by Cram and Alkadry (2018) to include cultural awareness, cultural knowledge, and cultural skills as

components of cultural competence. Cram and Alkadry (2018) stressed the importance of cultural competence being an ethical obligation for public administrators. Recognizing the different perspectives on the definition of cultural competence, Macqueen et al. (2020) argues there needs to be an agreed upon definition of cultural competence. In addition to the varying definitions of cultural competence, there are multiple perspectives on the conceptualization of cultural competence.

Beyond a definition, Blackburn (2020) focused on building a more robust conceptualization of cultural competence. To begin, Blackburn (2020) purports race is often substituted with terms such as ethnicity and diversity. In addition, Blackburn (2020) found that some definitions of cultural competence were incomplete by avoiding the history of race and racism. By avoiding race and racism there is a failure to deal with the systemic issues of race and power and the corresponding impact of those labeled as minorities (Blackburn, 2020). Blackburn (2020) suggested a more robust conceptualization of cultural competence will disrupt hegemonic narratives, to recognize power dynamics, biases, privilege, and impact of institutional racism. The impact of the reconceptualization of cultural competence is a transition from cultural competence being about the individual to an inclusion of social structures and possibly changing those structures (Blackburn, 2020). Other researchers openly question the approach to cultural competence.

There is tension in research about who should define and conceptualize cultural competence. Sinclair (2019), studying Aboriginal education, challenges dominant ideologies and practices that have defined cultural competence and rejects explanations of cultural competence that at times relies on portraying Aboriginal people inaccurately

as needing remedial assistance. According to Sinclair, Aboriginal people are intelligent, complex, and self-sufficient contending language use in the ideology of cultural competence matters. In challenging the dominant concept of cultural competence, Sinclair questions who is defining cultural competence and who is in the center in that definition. To understand cultural competence, it must be understood in a sociopolitical context (Sinclair, 2019). Sinclair also voices concern about the concept of competence and advocates for consideration of 1) whether one can be completely competent, 2) the implication of competence that can lead to a stereotyped representation of a culture, 3) culture being too multifaceted to have a discrete competency, and 4) competency objectifying a culture. Sinclair recommends that the culture being discussed should also be engaged in developing the definition of how cultural competency is defined. Although the conceptualization and definition of cultural competency is debatable, it is still an important disposition and skill for teachers to develop.

Teacher collaboration is an effective strategy for developing cultural competence. Polleck and Yarwood (2020) conducted a qualitative study to help teachers, serving primarily male students from a variety of Latinx and African nations, supply culturally relevant and sustaining instruction through a professional development model that used a constructivist and collaborative approach. Polleck and Yarwood (2020) linked modeling and collaboration to increasing the teachers' cultural competencies. Similarly, Johnson et al. (2021) examined a strategy for helping teachers develop cultural competence through collaborative teacher study groups. The researchers designed a mixed method study with 20 secondary social studies and English language arts educators. The collaborative teacher study group was as a form of professional development centering African

American history and culture. Evidence of a positive impact and significant shift in cultural competency was found using African American history, culture, and literature with the collaborative teacher group. Along with collaboration, teacher cultural competence can also be developed through educational activities such as simulations.

Cultural simulations are a tool for building teacher cultural competence in a constructive manner. Cultural simulations were used with teacher candidates in Hawaii to see the ways intercultural competence was promoted (Padua & Gonzalez Smith, 2020). Cultural simulation is an instructional technique whereby the teacher immerses in a cultural experience followed by a reflection structured to challenge negative assumptions or attitudes. As a result of the experiment, teacher candidates developed cultural competency. Within another domain, Markey et al. (2020) investigated the use of simulation pedagogy to develop cultural competence in nursing students. The simulations incorporate cultural diversity to improve the nurses' empathy, communication, and advocacy. Through the simulations, nurses practice ways of responding to patients during cross-cultural interactions (Markey et al., 2020). Cultural competence can be developed through active engagement in cultural simulations to construct knowledge about a culture.

As cultural competence is developed there are other considerations that impact the development of the skill. Teacher positionality is a factor in the development of cultural competence. Zoino-Jeannetti and Pearrow (2020) conducted a quantitative study on social privilege and social capital of future educators. The constructs of social privilege and capital are based in power held by possession of the constructs and positions within society (Zoino-Jeannetti & Pearrow, 2020). The goal of the study was to find the levels of

social privilege and capital held by teachers entering the field of education. Out of the 145 pre-education and pre-school psychology students, 87% were White and revealed a high level of both categories for the emerging school educators and support staff. According to Zoino-Jeannetti and Pearrow (2020), the study results have implications for the awareness and development of cultural competence because urban youth do not experience the same levels of social capital and privilege as the incoming professional educators. Moreover, teachers with social privilege and capital may have attitudes and beliefs about students based on the power held and associated personal beliefs. In addition to social privilege and social capitol, deficit ideologies and cultural distance may affect the use of teacher cultural competence.

Classroom practices, led by culturally competent teachers, can be impacted by the awareness of cultural distance, and limited by deficit ideologies. Flory and Wylie (2019) examined changes in teachers' cultural competence reflected in knowledge of students and their homelife and the influence of that knowledge on the teacher's practices. Cultural distance is the difference between teacher worldview and values and student worldview and values (Flory & Wylie, 2019). After experiencing a teacher workshop on culture, teachers participating in the research expressed an increased awareness of cultural distance between themselves and students and reported a desire to teach culture beyond heroes and holidays (Flory & Wylie, 2019). Meanwhile, Brooks (2018) conducted an ethnographic study with two high school teachers, one African American (Abby) and the other White (Martina), to examine cultural competence, race, gender, and the ways the two teachers make sense of their work. Based on the results found, Martina revealed a deficit ideology that characterizes marginalized students as deficient and thus Martina

sees herself as helping students by teaching them how to assimilate to the majoritarian ideologies. Therefore, the deficit ideology held by the teacher resulted in the antithesis of cultural competence in the classroom. Researchers have shown effective tools for teachers and other school personnel to use in the classroom to demonstrate cultural competence.

School personnel can employ researched based strategies to gather information in support of cultural competence in the classroom. Abdulrahim and Orosco (2020) synthesized studies conducted in K-12 public schools between 1993 and 2018 on mathematics using culturally responsive teaching or culturally relevant pedagogy (CRP). Findings include knowing students on a personal level as a strategy for cultural competence. To gather information about students, Jenkins and Rojas (2020) found evidence for using ethnographic interviews based on the funds of knowledge framework. The ethnographic interview protocol gives the user an opportunity to access the life knowledge and skills of those interviewed to expand cultural competence (Jenkins & Rojas, 2020). Consequently, when the collected student information is viewed as an asset, using the information contributes to the delivery of culturally competent services and decreases biases (Jenkins & Rojas, 2020). The information collected from ethnographic interviews can be of further use to teachers to develop curriculum and activities that foster new learning (Jenkins & Rojas, 2020). Cultural competence is displayed in practices as well as relationships.

Teacher cultural competence is reflected in classroom relationships, instruction, and learning. Similar to Jenkins and Rojas (2020), Padua and Gonzalez Smith (2020) contend teachers with a high level of cultural competence can use what they know about

the students' culture and demonstrate that knowledge through attitudes, practices, and standards that benefit instruction and increase learning outcomes. Polleck and Yarwood (2020) use personal connections as an indicator of cultural competence. As a result of the personal connections and the information learned about the students' culture, teachers were able to create assessments that demonstrate cultural competence by integrating students' identities and literacies (Polleck & Yarwood, 2020). Teacher candidates also connected their cultural practices to others and became aware of how personal biases affected their ability to work with different cultures. Finally, teachers considered ways to modify classroom strategies to improve instruction due to personal relationships reflecting cultural competence.

Researchers point to the importance of respect and rapport as a means for teachers to develop cultural competence in the classroom. When teachers demonstrate respect for the students, students are engaged in learning and the teacher, in turn, feels more effective (Flory & Wylie, 2019). Flory and Wylie (2019) found evidence that teachers that approached students with respect were able to establish rapports compared to teachers that did not use respect and rapport. Respect and rapport were then the tools used by teachers to gain cultural knowledge about students impacting teaching and developing the skill of cultural competence (Flory & Wylie, 2019). In addition to a respectful approach, students also benefited when personal identities are respected by the teacher (Howansky et al., 2021). Respect and rapport can be used to facilitate cultural competence development in teachers along with leveraging student identity.

Cultural competence involves the teacher centering student identity in classroom practices and not the teachers' culture. Howansky et al. (2021) noted the use of identity

safety cues (ISC) in the classrooms that were directed toward students. The use ISCs within the classroom environment message a sense belonging to students and are explicitly used during verbal instruction and within imagery Howansky et al. (2021). Instructional aids such as teacher created assessments can also reflect teacher incorporation of student identities (Polleck & Yarwood, 2020). Howansky et al. (2021) found evidence that ISCs may have implications for cultural competence, as well as student attendance, engagement, and efficacy. All students can benefit from centering student identities. However, researchers outline more strategies to aid specific groups of students.

Researchers propose strategies to specifically support culturally and linguistically diverse (CLD) students through cultural competence. Cultural competence skills are needed for successfully interacting with culturally diverse populations (Johnson et al., 2021). Cultural competence incorporates students learning about their own culture and the culture of others while maintaining pride in their own culture (Aronson & Laughter, 2016). Culturally relevant education has repeated indicators of a positive effect on student outcomes and deals with a teacher's beliefs and attitudes (Aronson & Laughter, 2016). Using academic success, cultural competence, and sociopolitical/critical consciousness, are tenets of CRP. Abdulrahim and Orosco (2020) outline the following practices for working effectively with CLD students during math instruction: 1) connect instruction to students' cultures in affirming ways to build math identity; 2) promote student engagement by making the connection between the students' culture or linguistic background and mathematical concepts; 3) actively engage students in mathematical conversations; 4) teacher reflection on their individual beliefs, values, and perceptions

regarding race, ethnicity, and culture; and 5) know students on a personal level.

Legitimizing the students' culture and using cultural competence, creates an interest in

math that could lead to improved achievement (Aronson & Laughter, 2016). CLD

students receive help from teachers who use cultural competence to provide instruction.

However, context and environment are relevant to cultural competence.

Environmental factors and context of learning influence teacher cultural

competence. Macqueen et al. (2020) compared the cultural competence levels of

preservice teachers in Australia to the United States. The results of the study were that

Australian teachers agreed more strongly than United States teachers that they would

treat all children equally regardless of race, culture, and language difference. The

researchers noted that assessing cultural competence is a cross-cultural issue and cultural

competence can be dependent upon the context (Macqueen et al., 2020). Howansky et al.

(2021) measured identity safety cues (ISC) that send messages to students traditionally

marginalized that their identities are valuable and respected while also creating a sense of

belonging for all students (Howansky et al., 2021). Based on the study, students have a

significantly higher sense of belonging, when ISCs are used in the context of learning

leading to implications for faculty to consider environmental cues, norms of inclusion,

inclusion language, and the inclusion of diverse perspectives in the content to

operationalize as it relates to cultural competence. Thus, cultural competence can be

impacted by the environment and context. Cultural competence can also lead to changes

in the school community.

Culturally competent teachers can have a positive school-wide impact on

discipline and classroom practices. LaForett and De Marco (2020) designed a model for

educator-level interventions incorporating assumptions, inputs, activities, outputs, and outcomes. In the logic model it is assumed that most teachers are not prepared to provide culturally competent teaching to support the needs of students of color. As a result, cultural competence training is one of the identified activities needed to reduce disproportionate discipline of students of color. The authors suggest cultural competence is needed because social emotional learning and classroom management do not explicitly address race and ethnicity which are critical to addressing the racial disparities in discipline. Meanwhile, Johnson et al., (2021) found classroom practices positively changed to reflect cultural competence after teachers received trained on African American history and culture through a collaborative teacher study group.

In summary, there are diverse definition and conceptualizations of cultural competence. Culturally competent teachers know their students and their backgrounds. Moreover, culturally competent teachers know themselves and recognize their positionality. Researchers have provided various strategies for teacher cultural competence development. Strategies to facilitate cultural competence in the classroom were also outlined. This theme is relevant to the study as utilizing cultural competence in the classroom is beneficial for all students especially African American students.

Teacher Development and Use of Sociopolitical/Critical Consciousness

This theme involves an examination of the sociopolitical/critical consciousness tenet within Culturally Relevant Pedagogy (Freire, 2020; Ladson-Billings, 1995). The theme involves sociopolitical/critical consciousness from both the teacher and student perspective applying a critical lens. Sociopolitical/critical consciousness practices are

explored relative to the study as a skill teachers can employ to facilitate math achievement for African American students.

The root cause of inequitable education practices and solutions exist on a broader systemic level. However, it is critical for teachers to develop and use sociopolitical/critical consciousness in the classroom. The absence of sociopolitical/critical consciousness impacts how teachers assess, validate, and prioritize their students' needs (Larkin & Hannon, 2019). Sociopolitical/critical consciousness development occurs at a microsystem level (Taylor, 2021) and is considered by scholars to be a journey (Kohli et al., 2019). Taking an intersectional perspective facilitates attention to external forces of marginalization and how those forces overlap and influence classrooms and teacher practices (Godfrey & Burson, 2018). An examination of what constitutes sociopolitical/critical consciousness follows.

Researchers vary on what factors constitute sociopolitical/critical consciousness. For example, sociopolitical/critical consciousness can be defined by an individual's keen awareness of power structures that shape the world we live in (Styslinger et al., 2019). While other scholars purport sociopolitical/critical consciousness is characterized as those who deeply analyze inequities while also feeling empowered to act (Diemer et al., 2021). Moreover, Lorenza (2018) contended critical reflection, critical motivation, and critical action are within the definition of critical consciousness. Defining sociopolitical/critical consciousness also requires an understanding of the role of oppression.

Recognizing oppression is central to the idea of sociopolitical/critical consciousness. According to Styslinger et al. (2019), critical consciousness is evident

when a person begins to see the contradictions and oppression, the difference between those that have and those that do not and begins to question why. Furthermore, awareness of positions of power and privilege and oppression, along with taking ownership of the impact, are central for critical consciousness development (Mosley et al., 2021). Sociopolitical/critical consciousness development further requires a shift in thinking.

Sociopolitical/critical consciousness is shown by a paradigm shift. Taylor (2021) asserted that for one to demonstrate critical consciousness, a shift must be made from accepting societal norms to analyzing all underlying assumptions about those norms. Godfrey and Burson (2018) highlight a shift from the focus on who is being marginalized to instead focus upon the systems that marginalize. The shift allows contextual factors (i.e., privilege and oppression) to be considered and addresses an assumption of homogeneity in the experiences of those marginalized. Sociopolitical/critical consciousness is not static but is instead multilayered.

Levels of critical consciousness can be seen in the school setting. Pollard (2020) provides levels of critical consciousness to characterize impact beyond the superficial. The limited level of critical consciousness is described as a technocratic, meaning linear and simple, cause and effect way of thinking, on concepts such as social class inequity, racism, and diversity (Pollard, 2020). Another level of critical consciousness is needed which goes beyond the stereotypical, superficial level (Freire, 2020). Next, teachers may demonstrate the productive level of critical consciousness by actively disrupting status quo teaching practices and engaging in teaching practices that raise student consciousness (Pollard, 2020). Moreover, productive level of critically conscious practices is student centered, strength based where students' backgrounds are known, and nurtured (Pollard,

2020). Finally, a transformative level of critical consciousness involves the teachers' awareness of power structures of race, class, gender, and sexual orientation within a specific domain i.e., teacher and student role in learning (Pollard, 2020). Teachers who possess sociopolitical/critical consciousness must hold certain knowledge.

Teachers need specific requisite knowledge and understanding to develop critical consciousness and facilitate equitable schooling. Teachers must have ideological clarity to guide critical consciousness and to stand firmly in their beliefs that will contrast with the dominant society to facilitate an equitable school setting (Alfaro, 2019). In addition, teachers should possess socio-historical knowledge and understanding to identify root causes undergirding oppression (Godfrey & Burson, 2018). Finally, teachers need an understanding of the current social inequities and social justice issues impacting people of color to employ critical consciousness (Freire, 2020). Sociopolitical/critical consciousness development begins on a personal level.

Critical consciousness requires a personal investment from the teacher. At a microsystem level, personal relationships aid in the development of critical consciousness (Taylor, 2021). Relationships in the classroom are built with care, empathy, and mutual respect (Pollard, 2020). Kohli et al. (2019) suggests the personal aspect of critical consciousness development extends to the teacher's positionality rather than formal training. The personal factor of development further extends to building a caring classroom and building connections to the community (Nojan, 2020). The personal aspect of sociopolitical/critical consciousness development is driven by dialogue.

Critical consciousness is developed through a dialogic learning context within the classroom. Dialogic strategies, such as sharing personal narratives and critical dialogues

on relevant social issues aides in development (Pollard, 2020; Styslinger et al., 2019). Shih (2018) outlines several implications for teaching based on dialogic pedagogy that contains: 1) love-based teaching, 2) humility-based teaching, 3) hope-centered teaching, 4) humor-based teaching, and 5) one that promote students' critical thinking about their teaching. Students need to actively engage in meaningful, critical dialogue to assess multiple perspectives to develop critical consciousness (Pollard, 2020). Although one aspect of development is personal and caring, there is an element of challenging the status quo.

Critical consciousness is disruptive by nature because it is intended to disrupt inequity and oppression. Critically conscious practices disrupt hegemonic practices and dominant ideologies (Alfaro, 2019). One area of practice teachers disrupt is data-driven decision making to counter deficit thinking of students, bias in tests, curriculum, instruction, and grading. (Dodman et al., 2021). Broadly, sociopolitical/critical consciousness extends beyond raising individual critical consciousness but also includes creating a different future by engaging in disruptive practices (Rutherford, 2018). Along the journey of developing critical consciousness possible hinderances arise.

Teachers may encounter hinderances while developing critical consciousness skills. Taylor (2021) explains a potential hinderance to development may come from peers of different races and ethnicities. Pre-service teachers may encounter hinderances while attending teacher preparation programs that foster hegemonic practices (Jackson & Knight-Manuel, 2019). In particular, educators of color may find there are practices that need to be unlearned (Jackson & Knight-Manuel, 2019). Teachers developing critical consciousness should expect to encounter hinderances.

A recent line of research has focused on the co-development of the critical consciousness among teachers and students. Youth need to develop critical consciousness especially those who are low income, immigrant, and youth of color (Godfrey & Burson, 2018). Shih (2018) argues Paulo Freire, a leading advocate of critical pedagogy, was aiming for a pedagogy that would allow both the teacher and student to develop critical consciousness and both student and teacher would understand their context and condition as a human being. Additionally, dialogue between student and teacher is the means to promote critical consciousness and liberty for both. Styslinger et al. (2019) supports interconnected practices to raise critical consciousness among students and teachers simultaneously. Teachers are central to student development of sociopolitical/critical consciousness.

Teachers are essential to student development of critical consciousness within the classroom. Teachers should be aware that student development of critical consciousness depends on the teacher's reflexivity, content knowledge, and background (Nojan, 2020). Teachers can facilitate caring classrooms by sharing their own experiences with inequality to facilitate student sociopolitical/critical consciousness in students (Nojan, 2020). Furthermore, teachers aid with development through curriculum by using real world concerns and creating connections to the local community to examine issues (Nojan, 2020; Underwood & Mensah, 2018). It is important to note students can develop critical consciousness skills as young as elementary level but may struggle with developing the skills with early childhood students (Sturdivant & Alanís, 2019). Curriculum and instruction are teacher tools to raise sociopolitical/critical consciousness in students.

Teachers cultivate critical consciousness through curriculum and instruction. Within the classroom, instruction should offer multiple perspectives on a topic (Styslinger et al., 2019), include ethnic studies (Nojan, 2020), and authentically intertwine culture within the content (Howell et al., 2019). Real world concerns can be embedded (Underwood & Mensah, 2018) along with dialogue and discussions to cultivate critical consciousness (Pollard, 2020). In addition to curriculum and instruction, teachers can take advantage of instructional strategies to facilitate student sociopolitical/critical consciousness.

Teachers can employ practical, in-class strategies to raise critical consciousness in students. Styslinger et al. (2019) suggests a privilege walk provides an opportunity to foster critical reflection. The activity entails the teacher sharing statements that students step forward to acknowledge the truth of a given statement it applies. Journals are also used for critical reflection (Styslinger et al., 2019). In addition to critical reflection teachers select texts intentionally to expose students to multiple perspectives (Styslinger et al., 2019). The texts are read critically using resistance reading to notice stereotypes of gender, race, and ethnicity (Styslinger et al., 2019). Beyond critically reading text teachers engage students in dialogue and discussion (Shih, 2018) that allow them to see and hear different perspectives. Finally, teachers can lead students through inquiry and activism to apply sociopolitical/critical consciousness in students (Styslinger et al., 2019). Teachers can help students develop sociopolitical/critical consciousness but may need external assistance.

Teachers may need assistance to develop their critical consciousness skills. Regardless of ethnicity or race, it should not be assumed that all educators of color

possess critical consciousness (Jackson & Knight-Manuel, 2019). In addition, many teachers are not prepared through teacher preparation programs which therefore impacts students (Alfaro, 2019; Kohli et al., 2019; Larkin & Hannon, 2019). The need for assistance remains even for those that may gained sociopolitical/critical consciousness skills prior to entering teaching through family and community experiences and a commitment to social justice (Kohli et al., 2019). Teachers need assistance to implement bicultural and sociopolitical instruction.

In summary, critical consciousness is developed in both students and teachers. Researchers agree that dialogue is essential to critical pedagogy and the development of sociopolitical/critical consciousness (Pollard, 2020; Styslinger et al., 2019). Before teachers, including teachers of color, can assist students in developing critical consciousness, prerequisite attitudes and dispositions must be in place such as reflexivity, relevant knowledge of the history of oppression and inequity is needed (Alfaro, 2019; Godfrey & Burson, 2018; and Nojan, 2020). Within the classroom, teachers help the students' critical awareness by fostering agency and developing the students' ability to interrupt oppressive patterns in themselves and others (Styslinger et al., 2019). In addition, researcher say building sociopolitical/critical consciousness is not without challenges. Teachers will have the challenges of building meaningful classroom communities across differences, functioning within systems of privilege and oppression that will impact group dynamics, along with struggles with effective communication (Taylor, 2021). The theme is relevant to the study as a skill teachers can use in the classroom to improve math achievement for African American students.

Academic Success in the Classroom

This theme involves a discussion of the culturally relevant pedagogy element according to Ladson-Billings (1995). Hinderances to or support of academic success will be addressed including relational interactions and deficit ideology (Battey & Neal, 2018; Lasater et al., 2021), teacher disposition (Stephens, 2019), and teacher noticing (Louie, 2018). Relative to the study, diverse aspects of teacher behavior, beliefs, and attitude are explored with a critical lens in relation to supporting or hindering academic success of students of color.

Academic success is a broad term encompassing varied teacher actions and mindsets related to student academic performance. Ladson-Billings' (1995) seminal work on culturally relevant pedagogy theory was developed with the goal of identifying effective teacher approaches for African American students. Academic success, a tenet of the theory, is demonstrated through the teacher's belief that students can and must succeed academically (Ladson-Billings, 1995). The teacher's belief and value of students is related to how teacher's think of themselves and others and manifests in rapport with students and equitable teaching practices (Ladson-Billings, 1995). The skillset and mindset of the classroom teacher affects the academic success experienced by students.

Student academic success is strengthened or hindered by student-teacher relational interactions, teacher disposition, and teacher noticing abilities. Battey and Neal (2018) articulate the importance of the teacher student relationship, in the context of math instruction, that supports or hinders learning. Teacher values, attitudes, and patterns of behavior, namely disposition, are also affected by content and pedagogical knowledge, knowledge of students, and the sociocultural learning context (Warren, 2018). Moreover,

Patterson-Williams et al. (2020) suggests teacher noticing, specifically attention, interpretation, and response to student thinking, is subjective if based upon the teacher's pedagogical commitments, beliefs, and philosophy of teaching and learning. Relational interactions, teacher dispositions, and noticing are manifested in teacher practices within the classroom (Battey & Neal, 2018; Patterson-Williams et al., 2020; and Stephens, 2019). The role of relational interactions should be examined as a factor of student academic success.

Student academic success can be mediated by factors beyond teacher content knowledge and instructional strategies. Battey (2013a) explored what "good" instruction looks like in an urban elementary mathematics classroom for students of color through the lens of student-teacher relational interactions. Relational interactions encompass any type of communication between two people, verbal or nonverbal, that enables or restricts the student's access to quality math instruction (Battey, 2013a). The researcher found that specific relational interactions (positive and negative) mediate access to mathematical learning for students of color including addressing student behavior, framing mathematics ability, acknowledging student contributions, and attending to language and culture (Battey, 2013b). Battey and Neal (2018) explored five components of relational interactions that include attending to language and culture, setting the emotional tone, addressing behavior, framing ability, and acknowledging student contributions with elementary students of color during that instruction. Within the results of the study 30% of the relational interactions during mathematics were addressing behavior and 91% of the time it was negative with African American and Latino students (Battey & Neal, 2018). Overall, the teacher interactions with African American and Latino students in the

math classroom were considerably negative in the aspect of behavior (Battey & Neal, 2018). Scholars make suggestions to address the mediating effects of relational interactions.

Addressing relational interactions for students of color is important to academic success. Researchers suggest that the teacher's struggle to manage student behavior during mathematics should be addressed to avoid hindering the learning process (Battey & Neal, 2018). Additionally, there is a recommendation for teachers to use relational interactions to become more aware of a hyper focus on misbehavior of African American boys (Battey & Neal, 2018). Acknowledging the hyper focus is critical in that White teachers have the poorest relational interactions with African American students which has a negative effect on student math achievement (Battey et al., 2018). Teacher disposition is an added factor in the academic success of students.

Teachers need a student-centered disposition. Truscott and Stenhouse (2018) used a mixed-method design to explore if teacher dispositions can be pedagogically specific in the urban setting using Culturally Relevant Pedagogy (CRP) and Culturally Responsive Pedagogy. Putting learners first was the most frequently identified disposition. Putting learners first, a disposition connected to the academic success tenet of the CRP theory, refers to instruction that is connected, authentic, relevant, and empowering to students (Truscott & Stenhouse, 2018). Moreover, respect for diversity, meaningful purpose and vision, and authenticity were teacher dispositions associated with cultural competence tenet of CRP (Truscott & Stenhouse, 2018). Scholars share desired teacher dispositions useful for academic success.

Researchers indicate specific teacher dispositions are conducive to academic success. Warren (2018) suggests the disposition of empathy, through perspective taking, is a tool for knowing students of diverse backgrounds in a more robust way to learn about the students' culture. The author adds, teachers that do not apply empathy reproduce and center norms Whiteness or other hegemonic cultural ways (Warren, 2018). Moreover, empathy is the means for acquiring new first-hand knowledge about students' lived realities, values, and sociocultural context to know to how to teach and make numerous professional decisions (Warren, 2018). However, Bullough (2019) cautions about the complexity and challenges of empathy as a desired teacher disposition suggesting empathy can be a cover for an inability to see the ethical aspect of a decision therefore making the disposition potentially harmful. Multicultural teachers attentive to the culture of their students should possess certain dispositions.

Multicultural and culturally responsive teachers use dispositions that are conducive to academic success. According to Johnson et al. (2021) dispositions are the intersection of the individual's way of thinking and their actions. Multicultural teacher dispositions of empathy, social awareness, meekness, inclusion, and advocacy are needed to work with students of diverse cultures (Johnson et al., 2021). Whitaker and Valtierra (2018) developed and validated a scale to measure dispositions for culturally responsive teachers. Within the scale, the disposition related to praxis is based on teachers understanding themselves and the effect of that on knowledge on their practice. The disposition of community encompasses the how the teacher structures the learning environment in such a way that values students, their families, relationships, and dialogue-driven pedagogy (Whitaker & Valtierra, 2018). Culturally responsive teachers

also possess a disposition of social justice, meaning they have an understanding that education is a civil right (Whitaker & Valtierra, 2018). There is a synergy between teacher dispositions and practice.

The teacher's disposition leads to practice and that must align with facilitating student academic success. Stephens (2019) suggests there should be an examination of pedagogical practices that cultivate dispositions because some dispositions are easier to see than others. Kerr and Andreotti (2019) found a gap between teacher self-reported dispositions related to openness and willingness to embrace diversity and address inequities in society compared to actual practices by the teachers. Teachers who reported dispositions of openness in practice reinforced Eurocentric ideologies in education and affirmed othering behaviors (Kerr & Andreotti, 2019). According to Stephens (2019), dispositions are not skills easily measured therefore one should exercise caution when using observed behavior as evidence of a disposition. Given the importance of teacher dispositions to student academic success, teacher development is needed.

Teacher dispositions can be cultivated. The right dispositions facilitate classrooms of passionate and compassionate educators authentically caring for students (Stephens, 2019). Helping teachers build awareness of their dispositional strengths and weaknesses is beneficial for students (Stephens, 2019). Truscott and Stenhouse (2018) found that teacher programs were able to cultivate specific dispositions related to a pedagogy, specifically CRP tenets of academic success and cultural competence. In addition, teachers should practice critical self-exploration and self-reflection to cultivate desired dispositions (Stephens, 2019). Teachers should also be aware that dispositions are shaped

by life experiences prior to entering the classroom (Stephens, 2019). As teacher noticing

abilities and disposition are cultivated, students will benefit.

Teacher noticing supports academic success and benefits students. Noticing

originated in the field of mathematics but can be applied in other subjects and disciplines

(Amador et al., 2021). Teacher noticing offers students support of their mathematical

thinking during the learning process (Amador et al., 2021). Teacher noticing is further

beneficial to reinforce or disrupt educational injustices within the classroom, particularly

for students experiencing marginalization (Patterson-Williams et al., 2020). Additionally,

lesson plans, student learning outcomes, and student identities can be developed by

teacher noticing. The benefits of noticing are related to the teacher's beliefs about

students.

Negative beliefs about Black students impacts teacher noticing and Black

academic success. Noticing is constructed culturally and socially (Louie, 2018). Williams

et al. (2020) questions the impact of teachers examining their practices and dispositions

that may be intertwined with a racist logic of Black intellectual inferiority. Deficit

ideologies reflect racial biases, including Black intellectual inferiority, stereotypes, and

blame of the individual (for systemic racism without contextualization the oppression

ultimately pathologizing students of color (Williams et al., 2020). The personal beliefs

and values of educators' matter to Black students as it leads to inequalities compared to

White students (Williams et al., 2020). By contrast, equitable teacher noticing in

mathematics, allows the teacher to recognize sociopolitical processes that privileges and

positions some students over others (Louie, 2018). Louie (2018) argues teachers must

manage dominant ideologies about students of color to avoid deficit thinking and focus

on culture and ideology to challenge teacher deficit views of students. Given that noticing can support or hinder academic success, noticing is a teaching skill that should be developed.

Researchers suggest teachers can develop noticing skills. When teachers have inadequate noticing skills, they do not elicit student thinking to build on it nor is there an adequate response of appropriate scaffolding (Kilic, 2018). Patterson Williams, Higgs et al. (2020) suggests teachers develop noticing for equity through intentionality and explicit attention to race, history, language, and justice. Moreover, teacher noticing is developed, in part, by training from teacher preparation programs and cultural experiences (Patterson-Williams et al., 2020). For teachers to effectively utilize the skill of noticing, the teacher must first value student thinking (Lee & Cross Francis, 2018). Notably, it is possible for teachers to value student thinking but not actually demonstrate the value in their practices (Lee & Cross Francis, 2018). Teachers with a high value for student thinking also put that value to practice and are more student centered rather than teacher centered (Lee & Cross Francis, 2018). Well-developed noticing skills, centering students are needed for academic success.

In summary, academic success for students can be supported or hindered by relational interactions between the teacher and student, teacher dispositions, and teacher noticing or the lack thereof. Ladson-Billings (1995) argues that how teachers positively think about themselves, and others fosters academic success when working with African American students. The teacher's beliefs about students, particularly students of color, are vital to fostering the appropriate disposition, relational interactions, and noticing beyond "good" teaching (Battey, 2013b; Patterson-Williams et al., 2020; Williams et al.,

2020). Deficit ideologies impact student academic success to the extent that teachers may not believe in the student's ability to learn and thus hinder the teacher from noticing and rendering appropriate support (Williams et al., 2020). Relative to the study, relational interactions, teacher dispositions, and teacher noticing may impact how teachers successfully or unsuccessfully support the math achievement of African American students. The predominant research methodology of the theme is qualitative allowing participants to share personal experiences regarding each respective phenomenon.

Math Feedback in the Classroom

Relative to the study, various aspects of feedback are explored. This theme involves a discussion of feedback (Wullschleger et al., 2020), feedback and achievement (Fyfe & Rittle-Johnson, 2017), and feedback in mathematics (Wong et al., 2018). It is important for teachers to understand the effective nature of feedback.

The focus of teacher feedback can affect the student's well-being. Responsive pedagogy involves recursive dialogue between the student's internal feedback and teacher feedback to facilitate the student's belief in their self-efficacy, competence (related to intrinsic motivation), ability, and increase self-concept (Smith et al., 2016). Teacher feedback can strengthen or weaken a student's belief in the possibility of mastering standards (Smith et al., 2016). Moreover, Wullschleger et al. (2020) conducted a longitudinal study of first through third grade teachers examining academic and social feedback as a predictor of social acceptance. Teachers mostly provided feedback on positive academic performance and negative feedback on incorrect social behavior. According to Wullschleger et al. (2020), teacher feedback on incorrect social behavior was negatively associated with social acceptance during classroom activities but not

during recess. Teacher feedback influences social acceptance and student collaboration (academic context) (Wullschleger et al., 2020). Classroom teachers should be aware of the effects on student well-being as well as the variability of results of feedback.

The type and timing of feedback given by the teacher yields differing results. Wong et al. (2018) examined the extent instrumental support (tangible teacher relational support to develop understanding of content) and appraisal support (teacher feedback on math performance) to promote math achievement from the perspective of 15-year-old Canadian students. From the student's perspective, instrumental support predicted better math achievement while feedback hindered student learning (Wong et al., 2018). Teachers need to be informed about and attentive to the type and amount of feedback provided to students (Wong et al., 2018). As it relates to timing, Fyfe and Rittle-Johnson (2017), conducted a study with 243 second and third grade students examining the impact of students receiving immediate (after each problem), summative (after completing a set of problems), or no correct-answer-feedback from the teacher during math practice. Students performed better when given immediate feedback but student that received no feedback scored even higher on a one-week posttest. It is important to note that students that did not receive feedback either scored very high on the assessment or very low (Fyfe & Rittle-Johnson, 2017). Overall, there are mixed results with feedback and the timing of feedback matters (Fyfe & Rittle-Johnson, 2017). Varying results of teacher feedback are also attributed to a misunderstanding or lack or reception from the student.

Scholars contend teacher feedback must be understood and received by the student. Van Der Kleij and Adie (2020) investigated the similarities and differences in how oral feedback is perceived and the purpose, value, and meaning of feedback from the

student and teacher perspective. Oral feedback provided by teachers can be easily misunderstood by students due to how it is (or is not) received and a mismatch of the purpose and nature of the feedback (Van Der Kleij & Adie, 2020). Perception of feedback is subjective, subject-specific, context-dependent, and individually dependent. Van Der Kleij and Adie (2020) reported that teachers should be aware that feedback is not received the same by all students. Given the perception of feedback can be subject specific, teachers can employ researched based best practices in the math classroom.

Researchers outline best practices for teacher feedback in the math classroom. Van Der Kleij and Adie (2020) recommend teachers employ dialogic feedback to address differing perspectives on feedback. A dialogic approach to feedback invites student contribution, sends a message of value for student contribution, and leads to a shared responsibility in the learning process (Van Der Kleij & Adie, 2020). Teachers are encouraged to find a balance between explicit instruction and co-construction of knowledge in the classroom (Van Der Kleij & Adie, 2020). Offering another best practice, Gamlem et al. (2019) investigated the use of responsive pedagogy with nearly 1,800 ninth grade math students measuring students' feedback, self-regulated learning, self-efficacy, and achievement in mathematics. By using responsive pedagogy during mathematics, small, significant differences were found in elaboration, task value motivation, effort and persistence, self-efficacy and self-conception compared to the control group (Gamlem et al., 2019). Responsive pedagogy and a dialogic approach are two best practice scholars offer for feedback in the math classroom. In addition to the two aforementioned approaches, teacher behavior is a factor in the classroom.

Teacher behavior and feedback can stimulate or limit students in the math classroom. Monteiro et al. (2019) found feedback was dominated by the classroom teacher using closed questioning which limits student active learning in mathematics. Teachers at times did not provide feedback to student responses (Monteiro et al., 2019). To stimulate student thinking, Monteiro et al. (2019) recommends teachers provide more feedback on the mathematical thinking process rather than the student's performance or task. Monteiro et al. (2019) argues teacher feedback should stimulate student thinking and reflection.

Teacher bias needs to be addressed to provide equitable feedback. Scott et al. (2019) observed classroom interactions to examine student and teacher race as a predictor of positive or negative feedback during instruction. The researchers found that Black students received disproportionately more negative feedback from both Black and White teachers when Black and White students had the same behavior (Scott et al., 2019). Scott et al. (2019) contends the responsibility for the student and teacher relationship rests with the teacher and biases should be addressed.

Summary

In summary, researchers have shown feedback can affect more than academics while also being influenced by several factors. The amount, type, and timing of feedback given by teachers are import for the teacher to consider (Fyfe & Rittle-Johnson, 2017; Monteiro et al., 2019; and Wong et al., 2018). However, the feedback must also be understood and received by the student. Furthermore, responsive pedagogy and a dialogic approach to math feedback indicates the importance of the exchange between teachers. If inappropriate and ineffective, feedback can hinder student learning and result in a social

cost to students (Wullschleger et al., 2020). As indicated by researchers, student and teacher race can impact the type and frequency of feedback given to African American students (Scott et al., 2019). Exploring the theme of general and math focused feedback provides a current literature on aspects for teachers to consider when providing feedback to African American students during mathematics.

The literature review began with learning and culture providing a context for culture in the classroom, describing various approaches, and establishing the interconnected nature of language, learning, and culture. Literature related to the components of culturally relevant pedagogy including cultural competence, sociopolitical/critical consciousness, and academic success are discussed in detail. Cultural competence, a journey rather than a destination, can be developed but requires teachers to be self-aware of their own culture, potential biases, and privilege (Zoino-Jeannetti & Pearrow, 2020). Critical consciousness requires critical dialogue and a willingness, on behalf of the teacher, to challenge the status quo. It is clear from the literature that there is much for all students, especially marginalized students, to gain from feedback using culturally relevant pedagogy (Aronson & Laughter, 2016). Notably, the teacher's beliefs, relational interactions, disposition, noticing, and dialogic strategies are critical for student academic success (Battey, 2013b; Truscott & Stenhouse, 2018; Warren, 2018). The final theme addressed in the review of literature encompasses types of feedback and factors that mitigate the effect of feedback such as the students' race.

As indicated in the problem space, there is a need to explore how feedback is delivered (Skovholt, 2018) and a better understanding of the factors that influence feedback (Schuldt, 2019). Specifically, how feedback is delivered to African Americans

during math (Hill, 2018; Savage et al., 2018). In addition, there is a need to further explore culturally relevant pedagogy to address the math achievement gap (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018).

The theoretical framework is embedded with the research questions. The first research question is informed by the culturally relevant pedagogy theory in that participants are asked how they developed their culturally relevant in providing feedback to students. The second research question will specifically allow the researcher to collect information from participants on how their cultural relevant pedagogy is used to provide feedback specifically to African American students from their personal experiences.

Problem Statement

It is not known how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction. Nationally, African American students have consistently struggled to demonstrate proficiency in math achievement compared to White students based on standardized tests (Kena et al., 2016). To address the lingering gap in performance there is a need to closely examine classroom practices (Hanushek et al., 2019). Teacher feedback and culturally relevant pedagogy are two practices each correlated with math achievement (Ortiz et al., 2018; Wong et al., 2018).

This qualitative descriptive study will reveal how teachers develop their culturally relevant pedagogy in providing feedback to all students and specifically African American students. The population of interest are all elementary teachers in the United States. The target population are grade level teachers of third through fifth grade students

in public elementary schools in Arizona. The sample will be selected from the target population. Sample will include 15-20 grade level math teachers of African American students in Arizona. The third through fifth grade teachers are members of Facebook groups and use culturally relevant pedagogy. One focus group with six to ten teachers will also be selected from the target population.

The lingering achievement gap has consequences for African American students (Battey, 2013b). For example, underachievement of young African American males correlates with decreased graduation rates and low college matriculation rates (Kena et al., 2016). In addition, African American students have fewer opportunities to be successful and more likely to be held back in mathematics compared to White students (Munter & Haines, 2019). Math achievement is attributable to earning differentials in adulthood for students of color (Battey, 2013a). Battey (2013b) notes the racialized effect of math achievement and math curriculum which acts as a gatekeeper limiting access to minoritized students into universities. It is imperative that teachers share their development and use of culturally relevant pedagogy in providing feedback to African American students so that teachers can learn from their experiences and improve math achievement for elementary African American students.

Summary

The literature review begins with learning and culture provide a context for culture in the classroom, describing various approaches, and establishing the interconnected nature of language, learning, and culture. Literature related to the components of culturally relevant pedagogy including cultural competence, sociopolitical/critical consciousness, and academic success are discussed in detail.

Cultural competence, a journey rather than a destination, can be developed but requires teachers to be self-aware of their own culture, potential biases, and privilege (Zoino-Jeannetti & Pearrow, 2020). Critical consciousness requires critical dialogue and a willingness, on behalf of the teacher, to challenge the status quo. It is clear from the literature that there is much for all students, especially marginalized students, to gain from feedback using culturally relevant pedagogy in the classroom (Aronson & Laughter, 2016). Notably, the teacher's beliefs, relational interactions, disposition, noticing, and dialogic strategies are critical for student academic success (Battey, 2013a; Truscott & Stenhouse, 2018; Warren, 2018). The final theme addressed in the review of literature encompasses types of feedback and factors that mitigate the effect of feedback such as the students' race.

As indicated in the problem space, there is a need to explore how feedback is delivered (Skovholt, 2018) and a better understanding of the factors that influence feedback (Schuldt, 2019). Specifically, there is a need to explore how feedback is delivered to African Americans during math (Hill, 2018; Savage et al., 2018). In addition, there is a need to further explore culturally relevant pedagogy to address the math achievement gap (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018).

The theoretical framework is embedded with the research questions. The first research question is informed by the culturally relevant pedagogy theory in that participants are asked how they developed their culturally relevant in providing feedback to students. The second research questions specifically ask participants to share how their cultural relevant pedagogy is used to provide feedback specifically to African American students from their personal experiences.

It is important to explore the teacher's development and use of their culturally relevant practices in providing feedback to African Americans. The math achievement gap between African American and White students persists and consequently impacts the future of African Americans (Munter & Haines, 2019). The proper dialogue between teacher and student (feedback) in the classroom can motivate students as well as facilitate math achievement (Smith et al., 2016; Wong et al., 2018). Researchers also contend the teacher's use of culturally relevant pedagogy (cultural competence, sociopolitical/critical consciousness, and commitment to academic success) in addition their disposition and noticing can impact the learning context and achievement of students particularly African Americans (Amador et al., 2021; Battey & Neal, 2018; Padua & Gonzalez Smith, 2020; Stephens, 2019; Underwood & Mensah, 2018). To address student achievement researchers recommend exploring teacher practices, such culturally relevant feedback, to better understand how teachers develop their feedback skills and what factors influence how math feedback is given to students (Hill, 2018; Savage et al., 2018; Schuldt, 2019; Skovholt, 2018).

Chapter 3: Methodology

Introduction

It is not known how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction. The research that still needs to be better understood is a qualitative description, from the teacher's perspective, of how their culturally relevant pedagogy was developed and how culturally relevant pedagogy is used in providing feedback to African American students, during math instruction (Hill, 2018). Savage et al. (2018) reiterated the same research focus by recommending the use of interviews to examine teacher practices during instruction to African American students in mathematics. Finally, Skovholt (2018) suggests that further study was needed to better understand how teachers deliver verbal feedback. The same recommendation is echoed by Schuldt (2019) and extended to examine what factors influence how feedback is given.

Chapter 3 includes a discussion on the research methodology and design used in the study. Included is a justification for this qualitative descriptive study on how culturally relevant teachers provide feedback during math instruction. Additionally, a description and discussion of the targeted population, sampling method, data collection and data analysis are also included in the chapter.

Purpose of the Study

The purpose of this qualitative descriptive study explored how elementary teachers describe the development of their culturally relevant pedagogy in providing

feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona. Data was collected through interviews from 10-15 teachers of third through fifth grade African American students and a focus group of 6-10 teachers that use culturally relevant pedagogy that also teach math to third through fifth grade African American students. African American students continue to underperform on state mandated math assessments compared to White students (Battey, 2013b). Researchers suggested classroom practices should be reviewed to address the lingering gap (Hanushek et al., 2019; Kelcey et al., 2019) along with the math and culture (Hill, 2018).

Research Questions

The phenomena for the study were elementary teachers' descriptions of the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona. Curriculum and teaching are cultural (Souto-Manning et al., 2018). Therefore, culturally relevant teachers use the student's culture to make math learning relevant to the student's context and culture (Souto-Manning et al., 2018). During data collection, teachers shared their perspective and personal experience with providing mathematics instruction to African American students through this descriptive study.

Teacher responses to how tenets of culturally relevant pedagogy influenced feedback to African American students during math instruction were highlighted in this study. Individual interviews and a focus group served as the methods of collecting data. The primary source of data were elementary teachers, that use culturally relevant

pedagogy, that teach or have taught African American students for a minimum of one year. Teachers were asked questions about how feedback was provided using the tenets of culturally relevant pedagogy, academic success, cultural competence, and sociopolitical/critical consciousness and the influence of the tenets on math achievement of African American students. The interview and focus group responses were used to answer the following research questions:

RQ1: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students?

RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction?

Rationale for a Qualitative Methodology

A qualitative methodology has been selected for the study. Qualitative methodology has several distinct features including representing the views and perspectives of the participants of the study (Yin, 2015). For the study, teachers shared their perspectives on the development of their culturally relevant pedagogy and how culturally relevant pedagogy is used to provide math feedback. Skovholt (2018) suggested that further study was needed to better understand how teachers deliver verbal feedback, and Schuldt (2019) called for the explore of factors that influence feedback. Additionally, Hill (2018) and Savage et al. (2018) indicated the need to explore the math teacher's perspectives on providing feedback to African American students. Culturally relevant practices may be a potential classroom strategy to mitigate the lingering

achievement gap in many subjects, including mathematics (Allen, 2008; Martell &
Stevens, 2019; Ortiz et al., 2018).

A qualitative method was appropriate for the study because it has been used by
scholars in extant empirical studies on culturally relevant pedagogy. Maddamsetti (2020)
used a qualitative method to explore culturally relevant pedagogy through field
experiences with in-service elementary teachers. Moreover, Martell and Stevens (2019)
applied a qualitative methodology to better understand the practices of teachers who
identified as culturally relevant social studies teachers. A qualitative methodology has
also been employed when exploring feedback (Van Der Kleij & Adie, 2020).

A distinct quality of qualitative research is that it enriches the readers knowledge
by exploring complex questions of what works and what does not work in reference to
the phenomena (Patton, 2015). Through the focus group and in-depth interviews,
culturally relevant teachers shared their experiences of what works and does not work in
their classrooms. Furthermore, qualitative research is a focus on applied and theoretical
findings based on research questions through field study in natural environments (Park &
Park, 2016). Based on the study, culturally relevant teachers shared their experiences of
applying the theory to their specific classroom context with African American students
during math. A qualitative method was appropriate because it contains distinct qualities
of representing the views and perspectives of the participants, enriches the readers
knowledge of a phenomena through questioning within the natural context and applies
theoretical findings based on research questions. Culturally relevant teachers shared their
views and perspectives of providing feedback to African American students during
mathematics.

How elementary teachers develop their culturally relevant pedagogy and use of their culturally relevant pedagogy in providing feedback to African American third through fifth grade elementary students during math instruction still needed to be understood (Ortiz et al., 2018). In this qualitative study, the researcher analyzed teacher interview and focus group data to gather personal views and perspectives regarding the influence of culturally relevant feedback on African American student achievement in math. A qualitative method was selected based on a recommendation from Hill (2018).

A quantitative method was rejected for this study. The quantitative method emphasizes measurement and focuses on social behavior that is quantified and found as a pattern rather than exploring phenomena and their meaning (Rahman, 2016). Quantitative research involves correlating variables and comparing groups, not exploring meaning within context (Schofield & Jamieson, 1999).

A quantitative method is appropriate when defining relationships among variables or an analysis providing statistical explanation (Baran, 2010). Quantitative research is not appropriate for this study because it is formatted to stress measurement and focuses on social behavior that is quantified and found as a pattern rather than discovering variables and their meaning, takes a snapshot of a given phenomenon and captures a specific moment of a variable, and is appropriate when defining relationships among variables or an analysis providing statistical explanation.

Mixed method is also not a strong match for this study. Mixed method provides an alternative to solely a qualitative or quantitative approach to research (Anguera et al., 2018). Mixed method involves using two sets of research questions, at least one set of qualitative and one set of quantitative. It is appropriate when the desire is to move beyond

a purely descriptive analysis of the phenomena or simply correlating variables or comparing groups (Baran, 2010). While a mixed method approach could be used to explore the phenomenon of interest, based upon the identified gap in the literature, there is not a particular need to add an examination of specific variables. As such, mixed method was not selected.

Rationale for Research Design

Qualitative descriptive was selected for this study. In addition, the design is appropriate when the phenomena are described (Sandelowski, 2000). Qualitative descriptive design is geared toward discovering who or how of an event or experience or basic shape and nature (Sandelowski, 2000). The qualitative descriptive design is used with the goal of describing the influence of culturally relevant feedback on African American math achievement. In previous research, Kelcey et al. (2019) noted the relationship between teacher knowledge, instructional quality, and math achievement mediated by factors such as the classroom context but did not describe the influence of specific classroom practices such as culturally relevant feedback before this study. Descriptions depend on the inclinations and sensitivities of the describer (Sandelowski, 2000). Therefore, this qualitative descriptive explores how elementary teachers develop their culturally relevant pedagogy and use of their culturally relevant pedagogy in providing feedback to African American third through fifth grade elementary students during math instruction through two sources of data. Through a descriptive study design the researcher is provided tools to gather information thorough data using interviews and a focus group.

Narrative research design is characterized by the analysis of personal narratives or stories communicates the personal sense of self (Huang Ju, & Shijing XU, 2015). Researchers interpret stories that are essential to life that impose a certain order and meaning to particular events (Lambert & Lambert, 2012). A narrative research design was not selected because it is an analysis of personal narratives that communicate the personal sense of self allowing researchers to interpret those stories as essential to life while imposing a certain order and meaning to particular events (Huang Ju, & Shijing XU, 2015; Lambert & Lambert, 2012). The purpose of the research is to gather data on the teacher's description of their development of culturally relevant pedagogy and a description of how their culturally relevant pedagogy is used to provide feed but will not be collected to communicate a sense of self in a story format nor discuss the meaning of particular events.

Grounded theory design is used when the researcher desire to create a theory based on data (Lambert & Lambert, 2012). This design is both an inquiry and a product of that inquiry (Chun Tie et al., 2019). Grounded theory is not appropriate because the researcher does not desire to create a theory based on data and because the design is both an inquiry and a product of that inquiry. In addition, grounded theory is not appropriate because the study built on the existing theory of culturally relevant pedagogy. Specifically, exploring culturally relevant pedagogy in mathematics and feedback in the study.

A single case study only has one focus. According to Yin (2015) case studies discuss how or why a single phenomenon happens. In addition, a case study was best fit when the phenomena and context are completely connected (Tetnowski, 2015). Case

study would not be appropriate because the focus is on a single phenomenon and the phenomena and context are not completely connected. A single case study was not appropriate for the study because the development of the teacher's culturally relevant pedagogy and the use of culturally relevant pedagogy to provide feedback is explored from the teacher's personal experience.

Phenomenological research design is descriptive but can also include interpretations (Giorgi, 2014). Unlike a narrative, phenomenological does not have a beginning, middle, and end (Allen, 2017). Phenomenological also presents events in other terms (Sandelowski, 2000). Moreover, phenomenology was inappropriate for the study as the focus of the study as not to uncover and interpret the inner essence of the participant's cognitive processing of a common experience (Wilson, 2015). The design is an option but not best option because it includes interpretations and meanings ascribed to the phenomenon.

Research done with a qualitative descriptive design intended to supply a comprehensive summary of the facts in everyday terms (Sandelowski, 2000). Furthermore, qualitative descriptive study design is the best option to collect data because it allows the researcher to stay closer to the data and to the surface of words and events shared by the describer (Sandelowski, 2000).

Population and Sample Selection

The population of interest is elementary teachers in the United States. The population is the largest group of eligible participants based on upon at least one common criteria (Asiamah et al., 2017). The target population (1.8 million) for this study are grade level teachers of third through fifth grade in public or charter elementary schools in

Arizona that are members of the Arizona Educators United Discussion Hub, Arizona

Alliance of Black School Educators, and Tucson Teacher Leaders Facebook Groups. The

target population represents a more refined group compared to the general population

(Asiamah et al., 2017). Those drawn from the target population and willing to participate

are included in the sample (Asiamah et al., 2017).

The desired sample will include 25 elementary math teachers of African

American students in Arizona. The third through fifth grade teachers were members of

Facebook groups that use culturally relevant pedagogy. One focus group with 6-10

teachers was the second method of data collection. The participants differ from those

participating in the interviews. A convenience sampling strategy was used from volunteer

respondents within the Arizona Educators United Discussion Hub, Arizona, Alliance of

Black School Educators, Tucson Teacher Leaders Facebook Groups, and the researcher's

social media page.

Interview and focus group participants were conveniently selected from

respondents receive the social media post, self-identify as belonging to the target

population, and express interest in participating in the study. Convenience sampling of

teachers that use culturally relevant pedagogy add to the rigor and quality of the study.

Qualitative Sample Size

A minimum projected sample size of 25 culturally relevant teachers were asked to

participate in interviews and a focus group to meet the required sample size and provide

adequate qualitative data. For qualitative studies, sample size is guided by the principle of

saturation or the point to which no additional information is gained (Mason, 2010). Data

saturation consists of both rich (quality) and thick (quantity) data (Fusch & Ness, 2015).

It is important to achieve data saturation because it effects the quality and validity of the research (Fusch & Ness, 2015). The sample size is appropriate for qualitative studies to reach research data saturation (Austin & Sutton, 2014). Data saturation is reached based on the richness and thickness of the data such that no new themes emerge from the data and all questions have been answered (Fusch & Ness, 2015). The minimum sample size of 10-15 interview and a minimum 6-10 focus group members is feasible based on the target population size of 1,200 third through fifth grade teachers within the Arizona-based teacher Facebook groups as estimated by the researcher.

Recruiting and Sampling Strategy

The primary recruitment strategy was convenience sampling through inviting teachers who are members of the Arizona Educators United Discussion Hub, Arizona Alliance of Black School Educators, Tucson Teacher Leaders Facebook Groups, and the researcher's social media page to participate in the study. The Facebook groups have a combined sample frame of 1,200 Arizona educators. For recruitment purposes, site authorization will be obtained from Facebook group administrators to access the target population. For this study, contact was made with the site administrators indicated on the Facebook group page via Facebook Messenger. The message contained information about the study such as the goal, informed consent, and contact information for the researcher. If approved, the site administrators will post the study and contact information of the researcher. Twenty to twenty-five teachers who meet the desired criteria will be asked to participate in the study. Convenience sampling is a nonprobability or nonrandom sampling where those in the target population meet practical criteria (Etikan et al., 2016). The selection process is deliberate and based on participants meeting the research

criterion, availability, and willingness to participate in the study. For this study those who self-identify and choose to participate, received study information, along with informed consent and the option to leave the study at any time. In addition, the researcher's social media was used for recruitment. Site approval is not required using the researcher's social media network (Palmer, 2020).

Additional plans are included should it become difficult to recruit participants using the initial plan. Plan "B" recruitment strategy to obtain sufficient sample size is to (a) contact participants who were either interviewed or participated in a focus group for referrals of other potential participants, which if used would be a snowball sampling approach. Snowball sampling is appropriate when the sample, meeting the criteria, is not easily accessible (Ghaljaie et al., 2017); and (b) expand the geographical boundaries to include teacher Facebook groups in the southwest regions of the United States. The added states will include California, Colorado, and Nevada. The added states will include California, Colorado, and Nevada. The states were selected due to the proximity to Arizona and each listed state includes multicultural or culturally responsive teacher professional standard. Site authorization was obtained from Facebook group administrators to access the target population. If approved, the site administrators will post the study information and contact information of the researcher.

Teachers who voluntarily participate in the study will sign an informed consent agreement by using DocuSign to take part after reading the goals of the study and understanding the research process. Gift cards worth $10 was sent to the participants via email upon receipt of returned transcripts. Teachers were given the option to opt out of the study at any time as well as opt out of being audio recorded at any time. To

participate in the interview and focus group, the informed consent and recruitment flyer will contain the following inclusion criteria, (a) have taught math to third through fifth grade African American students for a minimum of one year; (b) reside in Arizona, and (c) have used culturally relevant/responsive pedagogy. The term culturally relevant and culturally responsive pedagogy are used interchangeably (Mensah, 2021). This criterion was important because using culturally relevant pedagogy, while teaching African American students, can describe their experiences which aligns with the goal of this study.

Sources of Data

For the study, the phenomenon of interest involves how elementary teachers develop their culturally relevant pedagogy and use of their culturally relevant pedagogy in providing feedback to African American third through fifth grade elementary students during math instruction. The source of data are the responses from third through fifth grade teachers that use culturally relevant feedback. Two methods were used to collect research data, in depth interviews and a focus group. The information differs because it is enhanced by nature of the collection method. Specifically, participants in the focus group can explain the meanings, beliefs, and culture influencing the feelings, attitudes, and behaviors while providing a range of ideas, highlighting differences in perspectives (Rabiee, 2004).

Research, interview, and focus group questions were developed based on the review of literature. For example, Warren (2018) and Souto-Manning et al. (2018) definition of key terms from the theoretical framework were used in the interview and focus group questions. Working definitions were embedded into the questions in simple

terms to facilitate ease of understanding for participants and to create a shared understanding of the terms. Research questions were developed based on the problem space regarding feedback, mathematics, and culturally relevant pedagogy (Hill, 2018; Savage et al., 2018; Schuldt, 2019; Skovholt, 2018).

In alignment with the purpose of the study, the goal of research question one is the gather data on how the participants developed their culturally relevant pedagogy. As such, interview and focus group questions are designed to ascertain the participants experience with development of culturally relevant and motivation for developing culturally relevant pedagogy. Research question two is aligned with the use of culturally relevant pedagogy to provide feedback to Black or African American students. Specifically, the teacher's knowledge and use of the three tenets of culturally relevant pedagogy theory in teaching Black or African American students.

Research Data

Data for the study was collected from one source, using two methods namely interviews and a focus group. Two methods of data collection are used to provide rich, multidimensional data from teachers for the study (Fusch & Ness, 2015). The methods of data collection include in-depth semi structured interviews and a focus group.

Interviews. For the study, 10–15 semi structured interviews via Zoom, FaceTime or face-to-face was conducted to gather rich descriptive data on how elementary teachers using culturally relevant pedagogy describe the influence of the tenets of culturally relevant feedback on African American third through fifth grade elementary student's math achievement. Semi-structured interviews are conducted using predetermined open-ended questions followed by probes allowing for some divergence from the script

(McIntosh & Morse, 2015). Semi-structured were selected to allow for a more intuitive and natural conversation between the participant and researcher (Austin & Sutton, 2014). Additionally, semi-structured interviews will provide the opportunity for the culturally relevant teachers to share subjective responses on their experiences (McIntosh & Morse, 2015). Using semi-structured interviews are advantageous as each participant can speak freely (McGrath et al., 2018) providing rich clarifying, detailed accounts of the experience being explored (Polkinghorne, 2005) between the researcher and participant. In comparison, rich descriptive data, gathered from a focus group, are created through interactions between participants (Baillie, 2019).

Participants were selected from those (a) that meet the inclusion criteria; (b) volunteer to participate; and (c) provide contact information. Participants were given the opportunity to choose to participate in the semi-structured interview or focus group. To avoid volunteer oversubscription, the researcher will stop recruiting when first 15 participants are confirmed for attending the interviews and the first ten participants are confirmed for attending the focus group. A venue was selected and scheduled (video conferencing or in-person). An informed consent form detailing the studies goals and actions taken to preserve privacy was reviewed and signed by each participant. The objective of the interviews is to gather the "who", "what" and "where" from the participant's perspective (Sandelowski, 2000). Open-ended questions are used to yield in-depth responses from the culturally relevant teacher's perspective (Austin & Sutton, 2014). Interview questions and protocols were created based on the review of literature in Chapter 2 and included in Appendix D. The protocol is a procedural guide for the

interview process that includes a script and prompt for informed consent (Jacob &

Furgerson, 2012).

Focus Group. A focus group, of 4 to 6 participants, was conducted to gather

research data on how elementary teachers using culturally relevant pedagogy describe the

influence of the tenets of culturally relevant feedback on African American third through

fifth grade elementary student's math achievement. A broad range of information about

the phenomena are provided through a focus group (Sandelowski, 2000). In comparison

to the interview instrument and protocol, the focus group was used to gather a broader

perspective from the participant's dialogue. The focus group instrument will allow the

participants to engage in dialogue to create rich descriptions of their shared experience.

This will allow the researcher to explore how the participant's experiences are similar

and different. For the study, focus group participants will have the opportunity to share

ideas, perspectives, and thoughts in a less threatening environment (Onwuegbuzie et al.,

2009). For the study, open-ended questions, developed from the literature, is used in the

focus group to allow participants to flow naturally in their dialogue producing rich data

(Lauri, 2019). The focus group was recorded through video and audio with permission.

Focus group moderator protocols are created and included in Appendix D.

Demographic Questionnaire. During the interviews and focus group, descriptive

data was collected via a link to demographic questionnaire where pseudo names are used.

The link was provided for the participants through the chat feature. For the study

questions are asked to collect demographic data regarding (a) number of years of

teaching experience, (b) teacher race, (c) educational level, (d) source of culturally

relevant pedagogy training, (e) number of hours of training in culturally relevant

pedagogy, (f) county and state of residence. It is important to assure that the participants are a representative sample of the target population. The demographic data will create a demographic profile of the respondents.

Initially participants will have the choice to participate in either of the two data collection activities. Once, either data collection activity reaches the targeted number of participants, participants was informed of the activity that is available. Participants was asked if they still wish to volunteer for the activity.

Trustworthiness

It is critical for research data analysis to truthfully represent the phenomena being studied to ensure rigor in qualitative research (Johnson et al., 2019). For this study, steps were taken to adequately support the trustworthiness of the study. Credibility, dependability, confirmability, and transferability are factors for evaluating qualitative research (Johnson et al., 2019). A description of each follow, along with identified threats, and strategies to minimize the threats.

Credibility

Credibility ensures that study results accurately represent what was studied (Johnson et al., 2019). Inaccurate reporting of data is a threat to credibility (Johnson et al., 2019). For the study verbatim transcripts are derived from interview and focus group recordings. Researcher reflexivity is critical to credibility of the study findings. According to Berger (2015) during data collection the researcher must acknowledge and use self-reflection to foster awareness of personal biases, assumptions, beliefs, experiences, and social positions due to the risk of affecting the quality and integrity of findings of the study. Xerri (2018) adds engaging in reflexivity includes an awareness of

the researcher's role in constructing an interpretation of the reality being examined. The researcher will use memoing to account for reflexivity. To address the threat to credibility, participants will complete member checks of interview transcripts and interpretations for accuracy and rigor (Korstjens & Moser, 2018). A different set of participants than those completing interviews will take part in the focus groups to add to the credibility of the study (Onwuegbuzie et al., 2009).

According to Johnson et al. (2019) convenience sampling involves intentionally selecting research participants to optimize data sampling as those participants are the most appropriate for the research purpose and research question. Thus, convenience sampling is a rigorous approach compared to purposeful sampling that may result in low credibility due to choosing the most accessible research participants (Etikan et al., 2016). To ensure convenience sampling, the researcher will ensure that each participant meets the inclusion criteria indicated on the screening. To enact this approach, the researcher will review the inclusion criteria contained in the informed consent form. The researcher will assume that once the informed consent is signed, the participant has self-identified themselves as meeting the inclusion criteria.

Dependability

It is necessary for research findings to be repeatable. Dependability refers to detailed information about the process of the study to such a degree that the study can be replicated (Johnson et al., 2019). Tong and Dew (2016) described dependability to facilitate reliability through coherence across the methodology, methods, data, and research findings. The researcher will create an audit trail to enhance trustworthiness. The purpose of the audit trail is to audit the research decisions made along with the

methodological and analytical processes of the researcher (Carcary, 2009). Audit trails are further used as a lens to assess credibility (Carcary, 2020).

Full transcripts of interviews and the focus group discussions provide evidence for dependability. Participant responses during interviews and the focus group was recorded and transcribed to provide transparency and auditability (Tong & Dew, 2016). In addition, a codebook is developed which contains codes and code definitions to demonstrate dependability.

Transferability

Transferability refers to the extent to that research findings can be applied to other settings (Korstjens & Moser, 2018). Vague descriptions are a threat to transferability. Moreover, in qualitative research, the focus is on exploring phenomena in a specific context which is an inherent threat to transferability (Johnson et al., 2019).

To ensure transferability, a detailed description is provided of the research process and participant's demographics are outlined through the researcher's audit trail. The audit trail will include raw data, developed codes, and a systematic report of the actions taken for data collection and analysis (De Kleijn & Van Leeuwen, 2018). Raw data, the code book, and steps for data collection and data analysis was available to a Grand Canyon Academic Quality Reviewer through an upload by the researcher's learner dissertation page, A reader can determine if the findings are transferrable through a thick description of behavior, experiences, and context (Korstjens & Moser, 2018). For this study, a reader can determine if the research findings are applicable to African American students living outside of Arizona.

Confirmability

Researchers have the potential to bring biases and experiences in the research process. Confirmability refers to degree to which the research findings can be confirmed by other researchers and derived from the research data (Korstjens & Moser, 2018). In addition, confirmability ensures the perspectives provided represent the participants and that the perspectives are not unduly swayed by the researcher (Tong & Dew, 2016). Moreover, a threat to confirmability is lack of evidence from research data and bias (Korstjens & Moser, 2018).

For this study, the perspectives and experiences shared by culturally relevant teachers must be articulated with accuracy. To ensure confirmability, a code book is in the appendices to be confirmed by others. Member checking by the interview and focus group participants was implemented to ensure that data accurately represents their perspectives. In addition, interviews are recorded and transcribed to demonstrate objectivity.

Data Collection and Management

An interview guide in Appendix D was developed prior to IRB approval. The interview guide was reviewed by a three-member expert panel. Experts consist of individuals who have expertise in culturally relevant education, Africana studies, education, and psychology. Feedback from the expert panel was incorporated and reflected in the revised interview guide. Feedback from the expert panel addressed terminology in reference to African American students and creating a different set of questions for the focus group. Next, a field test was conducted with three individuals mirroring the target population using the interview guide. The field test was held through

Zoom. During the field test the interview and focus group questions were practiced.

Responses are also recorded with permission from the individuals. At the end of the field

test, the researcher solicited how the questions and interview skills can be improved.

Responses from the field test are not included the study. The responses were recorded,

transcribed, and then used for a draft code book.

Site approval from Arizona Educators United Discussion Hub, Arizona Alliance

of Black School Educators, and Tucson Teacher Leaders Facebook Groups was obtained

(See Appendix A). Site approval was obtained through sending a message to Facebook

messenger to the Facebook group administrators. The group administrators were asked,

in writing, to authorize access to the Facebook group members to participate in the study.

The access to the Facebook groups includes permission to make posts about the study.

After site approval was obtained, all required documents including the site

approvals are submitted to the Internal Review Board (IRB). The IRB oversees and

approves all research for Grand Canyon University. Data collection will not begin until

after required IRB approval is confirmed.

After IRB approval is obtained, recruitment for study participants begins.

elementary teachers that use culturally relevant pedagogy that teach math to African

American third through fifth grade elementary students in Arizona are recruited. Teachers

who respond to the social media post, made by the researcher, within the Facebook

groups was contacted via email or Facebook Messenger. The Facebook posts and flyer

will contain information about the inclusion criteria for participation. Specifically, the

information regarding the study includes the name and contact information of the

researcher, estimated time commitment, voluntary participation, title of the study, e-gift

card for member checking, and the focus on the study. The flyer was posted as an image along with a note containing a link to the recruitment for detailed information. This is done so that participants are aware of what the research they are volunteering for allowing them to opt out if they choose to do so. Teachers will have the choice of participating in either the interviews or focus group until the either of the data collection activities is full (i.e., 15 for interview and 10 for the focus group). At that point, the researcher will inform the participants of the data collection activity available. Ten to fifteen participants were interviewed, and 4-6 participants participated in the data focus group. Interviews were conducted first then the focus group will take place. The interviews will provide a first-person description. Then the focus group was used to gather a broad, rich description through group dialogue and interactions. Participants will receive and sign an informed consent agreement (Appendix C) prior to the beginning of the interview and focus group. A consent form detailing the studies goals and actions taken to preserve privacy and inclusion criteria, was reviewed, and signed by each participant through DocuSign.

An interview and focus group protocol were created for the study. The protocols contain a script for the researcher including an introduction, purpose of the study, recording instructions, consent forms, and a conclusion. The protocols provide a procedural guide for the researcher (Jacob & Furgerson, 2012). Verbally, participants were expressly informed that they may leave the study at any point. The interviews and focus group took place via Zoom. Interviews were scheduled by sending the participants an electronic calendar link. Each session was scheduled for 1-hour with at least a 1-hour break in between interviews. The focus group was scheduled by communicating with

participants via phone or email to find an agreed upon time. A consent form detailing the

studies goals and actions taken to preserve privacy and inclusion criteria was reviewed

and signed by each participant through DocuSign.

Before beginning of the interview and focus group, permission was asked to

consent to audio recording. All video cameras were turned off to further protect

participant identities. Once the recording begins, the participants was asked again if

consent is given for recording. During the interview, the interview guide protocol and

data focus group moderator guides were used to ask open-ended questions. For the

purpose of this study, probing questions were used during the interviews and focus group

to gain clarity as needed. Notes were taken with pencil and paper by the researcher. The

semi-structured interviews, via Zoom videoconferencing allowed the participants to

extend their thoughts. Two recordings of the interviews and focus group took place for

redundancy. After the interviews, typed transcripts was obtained using a transcription

service. The audio recording link from Zoom were uploaded to a website such as

temi.com for transcription. Then, the transcripts were sent to participants via email to

confirm accuracy and member checking. The email will contain instructions and a date

by which if not returned the transcript was assumed accurate. A review was conducted by

the participant if needed and the transcript is adjusted. Participant review is important as

it allows the participants to validate the information and add details that will aid the

richness of data (Frey, 2018). Gift cards worth $10 were sent to the participants via email

upon receipt of returned transcripts. The gift cards were sent to an email address provided

by participants. Researchers have used financial incentives to increase participation in

research (Cunningham et al., 2015; Sauermann & Roach, 2013). Email addresses were

permanently deleted from the file at the conclusion of the study. The focus group recordings were transcribed.

Upon completing interviews with the projected number of 10 – 15 participants and a focus group with a projected amount of 6-10 participants, they will determine if sufficient data is collected. According to Austin and Sutton (2014), the researcher should continue until nothing new is being heard meaning the field of interest is saturated. Therefore, the number of participants will depend upon the richness of the data collected (Austin & Sutton, 2014). Fusch and Ness (2015) recommended that saturation be viewed based on the richness and thickness of the data and when no new themes emerged rather than the number of participants. To ensure that nothing new is heard the researcher will conduct cursory data analyses while engaged in data collection. Coding began after several interviews are completed and continue to such time that now new data emerges.

After confirming that sufficient data has been collected the data collection stage is terminated. Collected data were primarily saved on an external hard drive. Collected data were safeguarded using passwords for computer and google drive files. Confidentiality and anonymity were maintained throughout the entirety of the data. Data was kept by assigning pseudo names i.e. I1, I2 (for interviews) and FG1, FG2 (for focus group).

A de-identified copy of the data and the data analysis was stored on the learner's dissertation page in the folder that is placed there for that purpose, allowing access to the data for the Academic Quality Review (AQR) reviewers. Research data will be securely maintained for a period of three years after the Dean's signature. After the three-year period, data will be destroyed by permanently deleting the file from primary external hard drive source.

Data Analysis Procedures

The purpose of this qualitative descriptive study explored how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona.

The following research question is a guide for the study:

RQ1: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students?

RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction?

For this qualitative descriptive study, research data from the interviews and focus group were analyzed. Open ended questions were used during interview and focus group allowing participants to share experiences and perceptions (Sandelowski, 2000). Research data will go through a rigorous cleaning and organizing process. Descriptive statistics are collected through the interviews and focus groups. Data were transcribed by using the otter.ai or similar transcription software. The transcription is uploaded to MAXQDA software for analysis. For the study, interview transcripts were sent to participants for member checking to establish credibility of the data. Interview and focus group research data were analyzed according to Braun and Clarke's (2006) six phases of thematic analysis. The researcher coded data after several interviews to assist with determining saturation.

Thematic analysis and descriptive statistics were used to analyze the data on how culturally relevant teachers provide feedback to African American students. Data from the demographic questionnaire were analyzed using descriptive statistics with central tendency and measures of spread. Descriptive statistics was summarized in the form of frequency, level, mean, median, and spread (Byrne, 2017).

Demographic data was reported using the following levels of measurement (a) number of years of teaching experience reported on a ratio level (b) teacher self-reported race reported on a nominal level, (c) teacher obtained education reported on an ordinal level, (d) source of culturally relevant pedagogy training reported on a nominal level, (e) number of hours of training in culturally relevant pedagogy reported on an interval level, (f) county and state of residence reported on a nominal level. Data collected through interviews and the focus group was analyzed through coding and thematic analysis.

Coding is used to find meaning of qualitative data. There are multiple coding systems available for researchers to choose from (Blair, 2015). Two cycle coding will involve reading and reflecting to develop codes (Valtierra & Siegel, 2020) inductively. Axial coding was used to draw connections between the codes to synthesize and organize the data (Scott & Medaugh, 2017). Axial coding is fluid, non-linear, and requires the researcher to continually modify emerging themes as more data is analyzed.

Thematic analysis is identifiable as being an analysis method within qualitative research which identifies patterns and/or themes within a particular data set (Braun & Clarke, 2006; Clarke & Braun, 2013; and Vaismoradi & Snelgrove, 2019). Prior to data analysis member checking of the transcripts is completed by the participants to ensure accuracy. To complete member checking, participants will receive transcripts via email

Instructions was given regarding the date and time transcripts need to be reviewed and

corrected if needed. The transcripts were returned to the researcher via email. Once

reviewed transcripts are received, the researcher will email an electronic gift card worth

ten dollars. Participants that do not return transcripts were assumed to be accurate.

Thematic analysis begins with becoming thoroughly acquainted with the data set (Braun

& Clarke, 2006; Clarke & Braun, 2013). Data analysis, using Clarke and Braun (2013) is

broken into 6 phases:

1. Multiple readings of the transcripts to become familiar with the content and listening to the audio recordings to become immersed in the data.

2. Develop codes using 2 cycle coding (open and axial) of initial ideas within MAXQDA to describe the development and use of culturally relevant pedagogy. The researcher will conduct the first cycle by creating a general list of meaningful units from the transcript data. This will allow the initial step and help describe the development of culturally relevant pedagogy and then a description of how culturally relevant pedagogy is used to provide feedback to African American students during math. Codes are numbered and defined in a codebook separated by each research question. An example of participant text to illustrate the definition will also be included. Responses are identified by numbers given to participants. Codes are then combined into broader categories where they intersect.

3. The codes are then combined into themes, from the categories developed from the 2-cycle coding in alignment with the research questions to describe the development and use of culturally relevant pedagogy. Themes are then labeled and defined.

4. The themes are reviewed to determine if the themes form a coherent pattern grouped separately to form a description of the development of culturally relevant pedagogy and a description of the use of culturally relevant pedagogy and accurately reflect the research data.

5. After defining and naming the themes, and examination is made to determine if the themes address the research questions. If the themes do not address the research question, the researcher will retain the codes as the themes may infer opportunities for new areas of research. Defining the themes includes capturing the essence of their meaning related to the development of culturally relevant pedagogy and the use of culturally relevant pedagogy.

6. Themes are then written up and reported logically.

The desired amount of data is a minimum of 8 pages, single-spaced, per participant, from the semi-structured interviews and the focus group. The projected about of data is 128-150 pages of transcripts. The projection is based on the field test which yielded approximately 70 pages of rich and thick data from three field test participants. The goal is to collect rich, thick data to be used to answer the research questions. Data was reported in tables identifying codes, themes, and descriptive statistics.

Ethical Considerations

The historical maltreatment of human subjects necessitates strict guidelines to ensure human subjects are protected. The guidelines address respect, justice, and doing no harm or beneficence. The Belmont Report outlines a framework to resolve ethical problems with every aspect of human subject research (Adashi et al., 2018).

By applying the principle of respect for persons, participants will also be informed that participation is voluntary and can be exited at any time to prevent coercion. Participants are informed of all risks involved in the study through the process of informed consent (Adashi et al., 2018). Participants were provided a copy of the informed consent form prior to the start of the interviews or focus group. The informed consent form outlines who have access to the research data including Grand Canyon University, peer reviewers, and the dissertation chair. Verbal consent for recording is asked before and after the start of the interview and focus group recordings.

In terms or beneficence, no study can be conducted without prior approval from the IRB. The IRB, through an exhaustive review, ensures compliance with the commitment to do no harm to participants. All risks to human subjects are disclosed and

addressed for protection. This further allows participants to make an informed decision about participation. This study posed minimal risk to participants.

To address the principle of justice, the study does not target members of vulnerable populations and does not ask participants to identify their race. The goal of this research was to understand the influence of culturally relevant feedback from the perspective of culturally relevant teachers and posed minimal risk to participants or their positions.

The researcher's positionality to the research is also considered as an ethical concern. Positionality includes how the researcher perceives themselves and the participants and how participants perceive the researcher (Bourke, 2014). Bourke (2014) further discusses (a) insider/outsider or the degree of the researcher's connection to the group being studied; (b) access or the privileged entrance into the world of the group being studied; and (c) power or how perceptions orientate behaviors. The researcher is affiliated with the target population of elementary teachers in that the researcher is an elementary school administrator. The researcher recognizes the potential influence and power associated with being in an elementary school administrator position. During recruitment and data collection, participants were informed and reminded that participation is voluntary and that the participant can opt out at any time without consequence. Member checking and reflexivity were performed by the researcher to address potential subtle coercion during recruitment and data collection and to distinguish participant views from that of the researcher. The researcher will mostly listen allowing the participants voice and experience to dominate the interview and focus group. Moreover, the researcher will engage in a constant internal dialogue along with critical

self-reflection of the researcher's position while collecting data (Berger, 2015) and also

being mindful of my positionality during data analysis (Braun et al., 2019). To enact this

constant internal dialogue, the researcher will use memoing. Data management is critical

to the protection of human subjects. Participant identities are coded to protect their

identities. For the purpose of this study, research data including, recordings, transcripts,

and code books, is readily available to the appropriate persons at Grand Canyon

University. Throughout the study process, all data were kept confidential. Data was

securely stored on a password protected computer and a password secure file. All

personal information such as last name or gender, along with all research data, is stored

for a three-year period and then destroyed by permanent deletion from the computer hard

drive.

Assumptions and Delimitations

It is important to discuss the assumptions and delimitations in the related to the

sample, instrumentation, methodology, data collection process, and analysis for the study.

Delimitations are the boundaries of a study imposed by the researcher (Theofanidis &

Fountouki, 2018). Assumptions are necessary but cannot be proven in the research

(Simon & Goes, 2018). The delimitations and assumptions are articulated to allow the

reader, of the study, to determine transferability and applicability of the research findings.

The researcher does not foresee the delimitations and assumptions impacting the results

of the study, which may allow for transferability and applicability to other studies.

According to Firestone (1993), there are alternative means for viewing transferability for

qualitative findings including case-to-case, sample-to-population, and analytic

generalization. Therefore, the outlined assumptions and delimitations may not pose a

threat to transferability. The researcher has provided detailed descriptions throughout the study so that the usefulness can be decided by the reader and user (Polit & Beck, 2010). The potential negative consequences, of the outlined assumptions and delimitations, and strategies to minimize or mitigate are discussed.

Outlined below are assumptions and delimitations accompanied by a rationale.

Assumptions

The following assumptions were present in the study:

1. It is assumed that interview and focus group participants on this study was not deceptive with their interview answers, and that the participants answered questions honestly and to the best of their ability. Potential negative consequences for transferability are that the study finding's do not accurately reflect the participant's experience and accurately describe how culturally relevant pedagogy is developed and used. Thus, the findings will not be useful for understanding the phenomenon in other settings. To mitigate the potential negative consequences, interviews and focus group was held outside of the school environment so that participants can feel comfortable sharing their experiences in a truthful manner.

2. It is assumed that participants in the study have used culturally relevant pedagogy and therefore are culturally relevant teachers. Identifying as a culturally relevant teacher is based on self-reporting by the participants. This assumption may impact transferability in that descriptions will not represent the phenomenon being explored. The study findings would not be useful to apply because the findings would be skewed. To minimize the potential negative consequence, inclusion criteria for participants were those that used culturally relevant pedagogy for a minimum of one year. The researcher will screen participants to ensure the criteria is met.

3. It is assumed that participants applied all the tenets of culturally relevant pedagogy in class while teaching mathematics to African American students. The three tenets include academic success, cultural competence, and sociopolitical/critical consciousness. If all three of the tenets are not used by the teacher, it would be difficult to apply the findings as the data is skewed. To mitigate this potential consequence the researcher has aligned questions and probes within the interview and focus group protocols that address each of the three tenets of the culturally relevant pedagogy theory.

Delimitations

The following delimitations were present in the study:

1. The sampling strategy was delimited to convenience sampling from Arizona teacher Facebook groups and the researcher's social media page. Due to COVID 19 impact, convenience sampling using social media provided more efficient access to the target population. The potential consequence for transferability is selection bias which may lead to underrepresentation of the target population. To minimize the potential consequence, the researcher will accept everyone who volunteers to participates and self-selects based on the inclusion criteria noted on the recruitment flyer.

2. Culturally relevant pedagogy is delimited as the theoretical framework instead of culturally sustaining pedagogy, an updated version of the theory, due to the relative newness of the most recent iteration of the theory. Culturally sustaining pedagogy has a broader focus on sustaining cultural ways of being understanding the schools have a part in perpetuating inequalities for minoritized students (Paris, 2012). Based on the delimitation, the study findings may not be useful in a context employing culturally sustaining pedagogy rather than culturally relevant pedagogy posing a potential threat to transferability.

3. The target population is delimited to elementary students that use culturally relevant pedagogy to reflect the development and use of the teachers familiar with the theoretical framework. In addition, the target population was delimited to elementary teachers due to the respective grade levels requirement to participate in standardize math tests. The potential consequence of the delimitation is that the findings may not be transferable to elementary grade levels other than third through fifth. To minimize the potential threat to transferability, the researcher will provide a thick description of the study.

4. The sample includes elementary teachers in Arizona, limiting the demographic sample. The potential transferability consequence is that the study findings may not be applicable outside of Arizona teachers. To minimize the potential threat to transferability, the researcher will provide a thick description of the study.

5. The methodology was delimited to qualitative instead of quantitative to reflect the perspectives of culturally relevant teachers. The potential transferability consequence is that the study findings may not be generalized to the larger population represented by the sample due to the qualitative methodology. To mitigate the potential consequence, the researcher will provide detailed demographic information about the participants to be used for the purpose of determining transferability.

6. The study design was delimited to qualitative descriptive. Based on the study design, transferability may be limited as only a description were provided. As such, the study findings will not provide the essence, interpretations or meaning of the personal experiences of the participants. Rich and thick data will be captured through interviews and a focus group to minimize the threat to transferability accompanied by an audit trail.

7. Data collection methods were delimited to semi-structured interviews and a focus group using open ended questions, excluding classroom observations, to gain rich, thick descriptive data. Based on the methods of collecting data, the findings may differ if other data collection methods were selected, thereby impacting transferability. To mitigate the potential threat to transferability, the researcher conducted used an expert panel and conducted a field test of the interview and focus group protocols and questions.

Summary

It is not known how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction. The sampling strategy was convenience to gather insight from culturally relevant teachers using the tenets of culturally relevant on their development and use of culturally relevant pedagogy to provide feedback to African American students. All required documents were submitted to IRB to ensure compliance and the protection participants including informed consent prior to data collection. For the purpose of the study, research and additional data was collected through two methods, interviews and a focus group. At the completion of data collection, all data was securely stored. Thematic analysis was conducted to prepare the study findings. Ethical considerations were also addressed including assumptions and delimitations.

Chapter 4 details the analysis of data for this study on the influence of culturally relevant feedback on math achievement. Thematic analysis is initiated with open codes that are then categorized and synthesized. The detailed approach allows for understanding the influence of culturally relevant feedback on math achievement in response to the research questions.

Chapter 4: Data Analysis and Results

Introduction

The purpose of this qualitative descriptive study was to explore how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction in Arizona. Scholars indicated a need to understand better how feedback is delivered (Skovholt, 2018) and the factors that influence teacher feedback (Schuldt, 2019). In addition, scholars noted further examination was needed into culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018). This chapter summarizes the data collected for this qualitative descriptive study, explains how the data was analyzed, and presents the results.

The researcher used in-depth interviews and a focus group to explore how teachers describe the development of their culturally relevant feedback and how teachers use their culturally relevant feedback to provide feedback to African American students. Through a qualitative descriptive design, two methods of data collection allowed the researcher to collect teachers' descriptions of how their culturally relevant pedagogy was developed and how culturally relevant pedagogy is used to provide feedback to African American students. A total of 17 teachers participated in the study. Virtual interviews were conducted with 13 teachers, and the virtual focus group consisted of four teachers. Both data methods asked teacher participants questions that were designed to answer both research questions. The following research questions guided this study:

RQ1:   How do elementary teachers describe the development of their culturally

relevant pedagogy to provide feedback to students?

RQ2:   How do elementary teachers describe their use of culturally relevant pedagogy

in providing feedback specifically to African American third through fifth-

grade elementary students during math instruction?

The research questions allowed the researcher to explore the phenomenon in the study. The phenomenon of interest involves how elementary teachers develop their culturally relevant pedagogy and use of their culturally relevant pedagogy in providing feedback to African American third through fifth-grade elementary students during math instruction.

The researcher followed the original data collection plan as outlined in the proposal. Saturation was reached after conducting the focus group. The researcher went on to conduct three interviews, after reaching saturation as they were already scheduled. Data from the additional interviews further confirmed the data captured in the first 10 interviews and focus group.

Preparation of Raw Data for Analysis and Descriptive Data

Preparation of Raw Data for Analysis

The two methods of data collection were interviews and a single focus group conducted virtually using Zoom Cloud Meetings. The researcher conducted 13 interviews and a focus containing 4 teachers different than those that completed interviews. All participants signed the informed consent form (See Appendix D) via https://www.docusign.com/ prior to the interview and focus group. The researcher saved each signed informed consent form on a personal, password-protected computer. After

the interviews and focus group were completed, the researcher downloaded the interview

and focus group audio files. The audio files were uploaded to http://www.temi.com/ to

produce raw transcripts. The transcripts were then downloaded to the researchers

personal, password-protected computer. The researcher listened to each audio file editing

the transcripts for accuracy. Editing included redacting names and personally identifiable

markers shared during the interviews and focus group. Once the transcripts were cleaned,

the researcher emailed the transcripts to each respective participant for member checking.

In the email, participants were asked to review the transcript for accuracy as well as

checking for their intensions. Each participant was provided three days to respond. Eight

participants responded confirming the transcripts and their meaning were accurate. Gift

cards worth $10 were sent to all participants via email.

Next, the researcher created two files for each transcript separating the content by

research and aligned interview questions. Each file was labeled according to the pseudo-

name i.e. assigned i.e. Antoinette-RQ1-Transcript, Antoinette-RQ2-Transcript, FG-RQ1-

Transcript. All interview and focus group transcript files were then imported into

MAXQDA separately. MAXQDA provided tools for organization and reliability. Finally,

all interview and memoing notes were saved on the researcher's private, password-

protected computer alongside the downloaded transcripts, videos, and signed informed

consent documents. The researcher backed up all documents and videos on a virtual,

password-protected storage device only accessible to the researcher.

Descriptive Data

Participants completed the demographic questionnaire through a link provided by

the researcher. All participants signed the informed consent form via DocuSign before

any data collection. The interview and focus group protocols focused on teachers'
experience developing and using their culturally relevant pedagogy to provide feedback
to African American students during math.

Interview and focus group participants were conveniently selected from
respondents that received the social media post, self-identified as belonging to the target
population, and expressed interest in participating in the study. Social media recruitment
began immediately after IRB approval was obtained by the researcher. Social media
recruitment was concluded after 21days. The researcher also gathered respondents
through snowballing. Snowballing was introduced after 11 days of recruitment when no
participants had been secured at that point. In total, two participants were referred by
participants. A maximum of one individual was referred by participants to avoid the risk
of sampling bias. The duration of snowballing was 10 days. The study sample consisted
of 17 teachers in total. Virtual interviews were conducted with 13 teachers, and a virtual
focus group contained four teachers. Three participants identified as male (23%), and 14
identified as female (77%) (Table 2). In terms of ethnicity, eight teachers identified as
African American (47%), six teachers identified as White (35%), two identified as
Hispanic (12%), and 1 participant did not provide a race. A few participants chose not to
answer some of the questions on the questionnaire as indicated by N/A. 13 out of 17
participants (76%) stated a personal pursuit as the source of culturally relevant training.
Nearly all participants reside in Arizona except for one. The teachers in the sample
predominantly held bachelor's degrees (53%), seven held master's degrees (41%), and
one had a doctoral degree. Participant teaching experience ranges from one to 23 years.

Table 2 outlines all participant demographic data collected via participant interviews and the focus group. Participants are listed using pseudo names.

Table 2.

Participant Demographic Data for Interviews and Focus Group

Participant	# Of Years Teaching	Race	Highest Earned Degree	Source of Culturally Relevant Training	Estimated # of Training Hours	County and State of Residence	Grade Taught
Michael	1	Black or African American	Bachelor's	Professional Development	5-8	Pima, AZ	4th
Susan	9	White	Master's	Personal Pursuit/Professional Development	20+	Pima, AZ	3rd
Mark	5	White	Bachelor's	Personal Pursuit/Professional Development	40	Pima, AZ	5th
Trina	20	White	Bachelor's	Professional Development	20	Pima, AZ	5th
Tamani	23	Black or African American	Bachelor's	Professional Development	5	Pima, AZ	4th
Leah	7	N/A	Master's	Personal Pursuit	8-10	Pima, AZ	5th
Nissi	21	Black or African American	Master's	Personal Pursuit	< 2	Pima, AZ	5th
Mauria	8	White	Bachelor's	Personal Pursuit/Professional Development	50	Pima, AZ	3rd
Marie	18	White	Bachelor's	Professional Development	10	Pima, AZ	5th
Antoinette	5.5	Black or African American	Bachelor's	Personal Pursuit	N/A	Pima, AZ	5th
Tee	5	White	Master's	Personal Pursuit	30	Maricopa, AZ	3rd
Dana	4	Black or African American	Master's	Personal Pursuit	30	Pima, AZ	5th
Liz	5	White	Bachelor's	Personal Pursuit	N/A	Pima, AZ	5th
Solomon	2	White	Bachelor's	Personal Pursuit	5	Pima, AZ	3rd
Joyce	11	Black or African American	Doctoral	Personal Pursuit/Professional Development	50+	Solano, CA	4th
Tasha	8	Black or African American	Master's	Personal Pursuit/Professional Development	4	N/A, AZ	5th
Tanae	18	Black or African American	Master's	Personal Pursuit/Professional Development/Personal Experience	50	Maricopa, AZ	5th

Note. Race defined in accordance with guidelines provided by the U.S. Office of Management and Budget (OMB) and self-identified by the participants. Training hours are self-reported by participants.

One-on-One Interviews

All interviews were conducted using the same interview protocol. Semi-structured interviews were conducted via Zoom. The mean duration of interviews was 56.23 minutes. Interviews were recorded and ranged from 32 minutes to 96 minutes. The shortest interviews were with Mauria and Susan lasting 32 minutes and 36 minutes, respectively. The researcher captured rich data from the interviews as the participants responded to the interview questions succinctly. Transcribed interviews were between 11 and 18 pages, single-spaced in length for a total of 200 pages. See Table 3 for a summary of the interview data. A sample of the transcripts is in Appendix G.

Table 3.

Participant Interview Data

Culturally Relevant Teachers (Participants)	Setting	Interview Date	Duration	# Transcript Pages (Times New Roman, Font size 12, single spaced)	Number of Codes Generated
Trina	Zoom	October 11, 2021	96 minutes	25	31
Susan	Zoom	October 11, 2021	36 minutes	12	35
Tamani	Zoom	October 12, 2021	49 minutes	13	36
Michael	Zoom	October 12, 2021	40 minutes	11	42
Nissi	Zoom	October 12, 2021	58 minutes	15	91
Mark	Zoom	October 13, 2021	78 minutes	15	29
Leah	Zoom	October 14, 2021	51 minutes	16	58
Mauria	Zoom	October 14, 2021	32 minutes	11	67
Antoinette	Zoom	October 16, 2021	60 minutes	17	32
Tee	Zoom	October 16, 2021	50 minutes	14	67
Joyce	Zoom	October 18, 2021	51 minutes	16	55
Tasha	Zoom	October 19, 2021	70 minutes	18	40
Tanae	Zoom	October 21, 2021	60 minutes	17	25
MEAN	N/A	N/A	56.23 minutes	14.7	48
TOTAL	N/A	N/A	731 minutes	200	656

Focus Group

A focus group school protocol was used with the virtual focus group via Zoom as outlined in Appendix E. The focus group was comprised of four culturally relevant teachers. The focus group lasted 137 minutes, producing 32 pages of transcripts, single-spaced. Participant contributions from the focus group data yielded 93 codes. Table 4 outlines a summary of participant contributions and codes during the semi-structured focus group.

Table 4.

Focus Group Data

Focus Group Participants	Group	Participation Length	Contributions	# Transcript Pages (Times New Roman, Font size 12, single spaced)	Codes Produced
Dana	Group 1	137 minutes	29	32	20
Liz	Group 1	137 minutes	49	32	25
Solomon	Group 1	137 minutes	27	32	11
Marie	Group 1	137 minutes	40	32	37
MEAN	N/A	137 minutes	36	32	23
TOTAL	N/A	137 minutes		32	93

Data Analysis Procedures

The purpose of this qualitative descriptive study was to explore how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction in Arizona. Data analysis began immediately following the completion of several interviews to determine saturation. To analyze the teacher's experiences in developing their culturally relevant pedagogy and using their culturally relevant

pedagogy to provide feedback, the researcher applied Braun and Clarke's (2006) six-step thematic analysis to identify, interpret, and report themes found within the data collected from the interviews and focus group. To employ current thoughts regarding Braun and Clarke's method, the researcher also used Braun and Clarke's updated version of the reflexive thematic analysis that provides guidelines, not rules, but a clear process (Braun & Clarke, 2021). Using this method of thematic analysis allowed the researcher to generate themes from the data that Capture a wide range of data that are connected by and have evidence of a shared idea (Braun & Clarke, 2021).

Trustworthiness

Trustworthiness is used to illustrate a study's value – that its outcomes are worthy of attention (Levitt et al., 2016). According to Hadi and Closs (2015), argued rigor within a qualitative study is necessary to impact policy and practice. The researcher fostered trustworthiness by using an expert panel, field testing, and member checking.

Expert Panel. A three-member expert panel reviewed the interview protocol. Experts consisted of individuals with expertise in culturally relevant education, Africana studies, education, and psychology. The purpose of engaging an expert panel is to ask experts to review the instrument's content or interview guide (Hyrkäs et al., 2003). The expert panel provided the researcher with feedback subsequently incorporated in the interview and focus group protocol.

Field Testing. Before data collection, the researcher conducted three field tests. Field testing is a method of checking to see that the questions being asked of participants work as intended and are understood by those likely to respond to them (Hilton, 2017).

The researcher individually met with three culturally relevant teachers who met the inclusion criteria for the study.

   Member Checking. The researcher used member checking to ensure that the transcription was accurate and represented the teacher's perspectives. Member checking is used in qualitative studies to maintain accuracy and create trustworthiness (Candela, 2019). Participants in the study were provided the opportunity to confirm or deny the accuracy of interpretations, thus adding credibility (Candela, 2019). Transcripts were emailed to all participants with instructions to return the transcripts in the time allotted and provided an e-gift card for completing the member checking.

Reflexivity Protocol

   Bracketing. The researcher conducted bracketing to track and manage biases in a reflective journal within MAXQDA while collecting and analyzing data. The researcher engaged in an internal dialogue along with critical self-reflection of the researcher's position while data was collected (Berger, 2015) and was mindful of positionality during data analysis (Braun et al., 2019). The reflexive journal was used to collect thoughts for subsequent reflection, interrogation, and meaning making (Braun & Clarke, 2021). The researcher used the reflexive journal during the data collection and coding process. The researcher used the reflexive log to collect challenges and wonderings during the data collection process. Finally, the researcher met with the research supervisor to review excerpts from the reflexive log. Using the reflexive journal helped the researcher to identify and manage preconceived notions about the participants and to set them aside. The researcher was a Black or African American, culturally relevant educator interviewing other Black or African American, culturally relevant educators so

bracketing was essential to the study's credibility and trustworthiness. For example, before interviews and the focus group were conducted, the researcher would spend time mentally identifying biases and beliefs the researcher held about Black or African American teachers, Black or African American students, and culturally relevant pedagogy. The researcher especially meditated on the temptation to insert knowledge of culturally relevant pedagogy and Black or African American culture to distinguish the researcher's preconceptions from the perspectives of the participants. The researcher also bracketed in written form.

Moreover, the researcher held preconceived ideas about teaching as the researcher is currently employed as a school principal that evaluates teachers. The researcher held ideas about what effective feedback should look like in a classroom. Bracketing was necessary to refrain from imposing the researcher's ideas of quality feedback. To bracket, the researcher spent time meditating on resisting the opportunity to impose the researcher's definition of effective feedback. This helped the researcher to approach each interview and the focus group as if no prior knowledge of the participants existed.

Peer Debriefing. The researcher utilized peer debriefing to strengthen the credibility of the research (Henry, 2015). The researcher conducted peer debriefing to make implicit aspects of the data analysis explicit to the researcher. The researcher met with the peer reviewer and received constructive feedback that challenged the developed themes and thematic analysis (Henry, 2015). The peer reviewer has a Ph.D. and completed a descriptive study on feedback. The researcher and peer reviewer met over Zoom after coding, categorizing, and generating themes. The researcher walked the reviewer through the codes, categories, and themes in MAXQDA.

Data Analysis Steps

Braun and Clarke's (2006, 2021) six phases of reflexive thematic analysis were used to analyze the data and report the experiences shared by the culturally relevant teachers. Thematic analysis is a robust method for developing, analyzing, and interpreting patterns across a qualitative data set (Braun & Clarke, 2021). The phenomena for the study are elementary teachers' descriptions of the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction in Arizona. Braun and Clarke's (2021) reflexive thematic analysis provided a guide to analyzing the two sources of data that answered the two research questions. In this study, the reflexive thematic analysis provided a deeper understanding of the teacher's descriptions of the development and use of the culturally relevant pedagogy to provide feedback to African American students during math instruction. Open and axial coding was used to uncover concepts that recurred from the data analysis of the semi-structured interviews. Using thematic analysis, the researcher identified codes and themes from the sources to answer the research questions.

Braun and Clarke's (2006, 2021) six phases of thematic analysis have six phases:

1. Familiarizing Self with the Dataset
2. Coding
3. Generating Initial Themes
4. Developing and Reviewing Themes
5. Refining, Defining, and Naming Themes
6. Writing Up

Phase 1: Familiarizing Self with the Dataset. During this phase, the researcher gained intimate knowledge of the dataset through immersion and critical engagement (Braun & Clarke, 2021). During the familiarization phase, the researcher is not just taking in information but also asking themselves deeper questions about the data (Braun & Clarke, 2021). To accomplish Phase 1, the researcher printed the transcripts, read through the interview and focus group transcripts, and listened to all audio recordings multiple times. During this immersion of both data sets, the researcher made notes of initial thoughts and wonderings about the dataset on a notepad and within the reflexive journal. The transcripts were then organized by research questions and imported into MAXQDA for the second phase, coding.

Phase 2: Coding. The researcher developed codes using two-cycle coding (open and axial) of initial ideas within MAXQDA to describe the development and use of culturally relevant pedagogy. In Chapter 3, the researcher initially planned to number the codes but found it more appropriate to use semantic and latent coding. As described by Braun and Clarke (2021) meaning can be derived from the semantic (surface level, participant-driven, descriptive) and/or latent (deeper, more implicit, researcher-driven, conceptual) level. As recommended by Braun and Clarke (2006), complete thoughts of participants were captured to maintain the context of the code and to not lose meaning

Each transcript was read again during the coding phase, systematically working through each data item in the entire dataset. The researcher conducted the first cycle by creating a general list of meaningful units from the transcript data. This allowed the initial step and helped describe the development of culturally relevant pedagogy and how

culturally relevant pedagogy is used to provide feedback to African American students during math.

The researcher ensured the code labels were not too broad during coding and indicated some specific meaning to the data. The researcher used an ongoing iterative process of refining and revising codes and their assigned definitions throughout the coding development process. As new codes were generated, the researcher reread previous codes, adjusting as needed to the code labels and definitions. Coding within MAXQDA allowed the researcher to easily identify, count, define, and modify codes as needed. MAXQDA aided the researcher in organizing the codes into categories separated by the research questions. After the first round of initial coding, the researcher had 72 codes across all 14 transcripts; there were 19 codes for RQ1 and 53 codes for RQ2. Table 5 below shows some initial codes, categories, and representative quotes. For a complete initial codebook, see Appendix F.

Table 5.

Sampling of Initial Codes, Categories, and Representative Quotes

Participants	Codes	Categories	Representative Quotes
Tee	Seeking to learn from others	Self-initiated CRP development	"I try to meet with other teachers. I tried to meet with teachers who are with backgrounds different than my own. So specifically I'll meet with teachers who are Black or who are Mexican American because they have insight that I cannot have."
Tasha	Teacher prep to support development of CRP	Source of CRP development	"I would have to say the most I've learned about it was through my student teaching."
Leah	Development facilitated by a personal experience	Self-initiated CRP development	"Personal experience, a thing is I come from a very small immigrant community and grew up just feeling like I didn't quite belong in the classroom. So my entire journey of wanting to become an educator was kind of like to undo that for other students."
Marie	Self-directed reading and research to develop CRP	Self-initiated CRP development	"I've attended lots of PD and read many, many books about teaching diverse cultures and particularly African-American students."
Trina	School/district PD do not support development of CRP; Development from self-paid/personal pursuit of development	School/district PD to support development of CRP	"Unfortunately, I don't feel like my district puts priority on that. So I've had to do this. I feel like I've had to do it myself whether I pay for it myself."
Dana	Community built within the CRP classroom	Context of culturally relevant feedback	"It's great that the students are even giving are brave enough to give an incorrect answer, you know because that says something about your classroom that it's a safe place."
Michael	Black to Black racial congruency	African American culture and feedback	"Well, I think for me, I know that African-American students, when they come to me, I've, I've seen it. And I've had other administration and other teachers tell me that they respond much better to me and to other teachers they've had past or with other teachers that they see currently. And so for me, I feel like while I have them and they're in that place where they maybe just feel safe because there's another black person that is in charge of them in that moment that we get as much work done as we can in math and get them to a place where they feel confident enough that they don't need that familiar face with me to trust the next teacher, to take them where they need to go in both math and every other subject."

Phase 3: Generating Initial Themes. The third step in the thematic analysis required the researcher to search for themes within the data (Clarke & Braun, 2016). The researcher combined the codes into themes, from the categories developed from the 2-cycle coding in alignment with the research questions to describe the development and use of culturally relevant pedagogy. Within MAXQDA, the codes were grouped into categories based on similarity. Some codes were not used, combined, or reorganized. For example, "Connections to Beliefs to Feedback" was combined with the code "Beliefs and practices for the academic success of African Americans". The researcher also initially coded responses for the development of CRP that were the use of CRP instead. Once that was detected, the researcher carefully reviewed all codes and categories to align with the appropriate research question.

Once the grouping was complete, the researcher labeled categories. There were 16 categories: five categories for RQ1 and eleven categories for RQ2. The categories were: (a) CRP Component Strategies, (b) Development of a teacher disposition for CRP teacher praxis, (c) Self-Initiated CRP Development, (d) Teacher Preparation to Support CRP Development, (e) School/district Professional Development/training to support CRP Development, (f) Timing and setting of CRF, (g) Teacher noticing, (h) Teacher's culture, (i) Consideration for feedback (j) Teacher beliefs and practices, (k) The classroom community (l) Connections to the family (m) Black-to-Black racial congruence (n) General use of African American culture (o) Communicating caring and respectful feedback (p) Methods of corrective feedback.

Phase 4: Developing and Reviewing Themes. The researcher conducted step four next, which consisted of writing and reviewing themes. The themes were written and

reviewed to determine if the themes form a coherent pattern, grouped separately, to form a description of the development of culturally relevant pedagogy and a description of the use of culturally relevant pedagogy and accurately reflect the research data. The researcher read the developed codebook multiple times before writing the initial themes. Braun and Clarke (2006, 2021) recommended that the researcher looks for patterns of meaning across the dataset. To accomplish this, the researcher used MAXQDA to review the categories, codes, and connected transcript excerpts, again searching for larger patterns of meaning across the dataset. The researcher also reviewed the themes to determine if there was sufficient data to support the themes and, if not, should the themes be combined. The researcher reviewed the initial 10 categories and found that some categories should be separated. After revisions and further analysis, the researcher generated a total of five emergent themes and 16 emergent categories. Two themes answered RQ1, and three themes answered RQ2.

Phase 5: Refining, Defining, and Naming Themes. The researcher identified preliminary themes. Broad themes were identified and analyzed to ensure they supported the codes in the codebook. The researcher reviewed the themes and respective descriptions to determine if the themes form a coherent pattern grouped separately to form a description of the development of culturally relevant pedagogy and a description of the use of culturally relevant pedagogy and accurately reflect the research data. Categories were also created to bring analytical attention and emphasis to an aspect of a theme (Braun & Clarke, 2021). For example, in theme five, culturally relevant teachers describe how African American culture is used to provide feedback. The theme is supported by categories that describe how African American culture is used by

connecting to the family, the Black teacher to Black student racial congruency, and the general use of African American culture in providing feedback. Codes that had insufficient frequency were collapsed into similar codes. The themes were then organized by the research questions they answered. Finally, the researcher created theme definitions to clarify and illustrate what each theme was about. Table 6 contains the descriptions of all themes and categories aligned with the research questions.

Table 6.

Research Questions with Associated Descriptions of Emergent Themes and Categories

Research Question	Descriptions of Emergent Themes	Descriptions of Emergent Categories
RQ1	1. CRP Teachers describe the strategies used to develop CRP component skills and development of a teacher disposition for CRP teacher praxis	(a) CRP teachers describe strategies to develop CRP component skills (b) CRP teachers describe development of a teacher disposition for CRP teacher praxis
RQ1	2. CRP teachers describe the sources of CRP development	(a) CRP teachers describe the development of their CRP on a personal level (b) CRP teachers describe how teacher preparation program developed their CRP (c) CRP teachers describe how school/district developed their CRP
RQ2	3. CRP teachers describe the teacher-based context of culturally relevant feedback to African American students	(a) CRP teachers describe the timing and setting to provide feedback to African American students (b) CRP teachers describe how they recognize when African-American students need feedback (c) CRP teachers describe their awareness of the impact of their culture on feedback (d) CRP teachers describe considerations for feedback to African-American students (e) CRP teachers describe their beliefs and practices for academic success of African-American students (f) CRP teachers describe the community built within the CRP classroom
RQ2	4. CRP teachers describe how African American culture is used to provide feedback	(a) CRP teachers describe using African American culture by connecting family conversations and expectations in feedback (b) Black CRP teachers describe the use of Black-to-Black connection and relationship to provide feedback (c) CRP teachers describe their approach and strategies to make learning relevant to AA students.
RQ2	5. CRP describe how corrective and disciplinary feedback is delivered to African American students during math instruction	(a) CRP teachers describe giving corrective/disciplinary feedback by demonstrating care and respect for the African American student (b) CRP teachers describe the methods used to provide corrective feedback to African American students

Phase 6: Writing Up. The final phase is to produce a written report of the

thematic analysis (Braun & Clarke, 2006). After completing the analysis in phase 5, the

results were written and detailed in Chapters 4 and 5. The results were written more

formally for the intended audience and tells the story from the data (Braun & Clarke, 2021).

Results

Presenting the Results

Through thematic analysis, codes, themes, and categories were generated from transcripts of 13 virtual one-on-one interviews and one virtual focus group with elementary CRP teachers. In this section, the researcher analyzed the codes that were identified in transcribed interviews as well as a focus group of culturally relevant teachers and how they support themes that were found in this study. Saturation was met when the researcher did not see new codes (Guest et al., 2006). The researcher met data saturation after conducting the focus group. After the focus group, the researcher did not identify any new codes in the data relevant to the two research questions. The researcher proceeded with the additional interviews as they were already scheduled. The additional data collected served as a confirmation. To protect the participant's identities, participants were assigned pseudo names.

Figure 2 shows the sample code emergence and usage captured from MAXQDA software. Participants are identified horizontally (pseudo names are slightly abbreviated) while codes are listed vertically (See appendix J for complete list of code emergence and usage). The participants are listed in the order in which the interviews and focus group occurred. The codes are sampled from RQ1. No new codes emerged for RQ1 and RQ2 after the focus group (FG).

Figure 2.

Sample Code Emergence and Usage
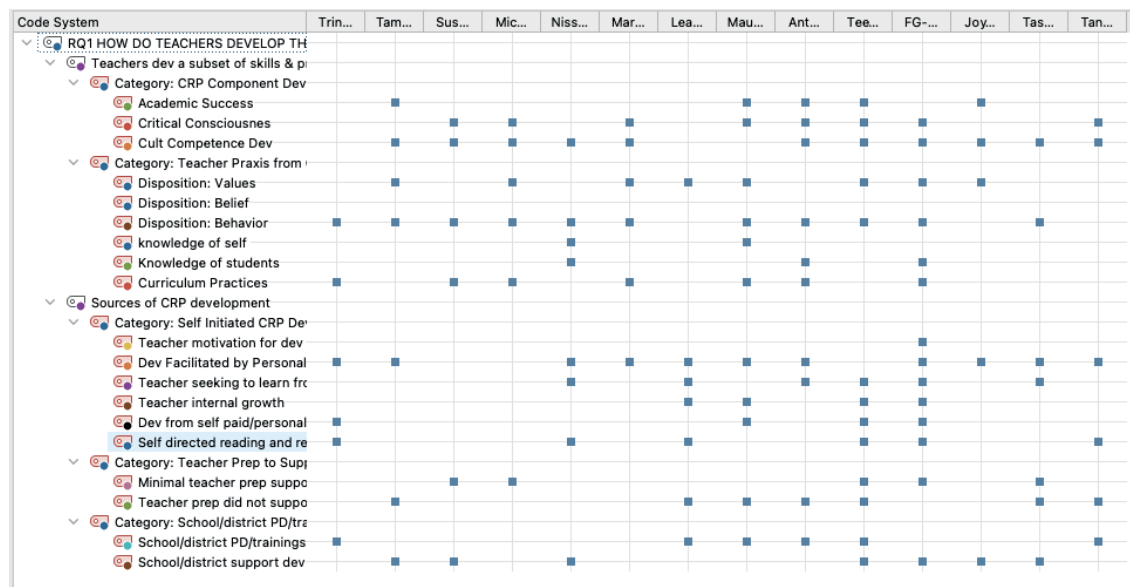
Research Question 1 (RQ1)—Findings

RQ1 addressed how elementary teachers develop their culturally relevant

pedagogy to provide feedback to students. Themes one and two, including the

accompanying categories, were generated from the teachers' experiences around the

phenomena in response to RQ1. Theme one is focused on strategies to develop CRP

components. Theme two is focused on the sources of CRP development. The researcher

provided examples and excerpts in the discussion of the themes and categories.

Theme One—CRP Component Strategies and Praxis. Theme one focused on

how teachers described the strategies used to develop the three components of culturally

relevant pedagogy specifically, facilitating academic success for students, using cultural

competence, and critical consciousness in the classroom. Within this theme, teachers also

described their CRP praxis developed from the strategies. Thirteen out of 13 teachers, as

well as members of the focus group, shared their strategies used to develop the three

components of CRP and their CRP praxis. Teachers described using conversations with students and culturally diverse people, reflection, self-checks, being open to learning, looking at multiple perspectives, and learning about the history of the education system as strategies to develop their academic success, cultural competence, and critical consciousness.

To develop her ability to facilitate the academic success component of CRP, Tee shared her strategy: "And just having those conversations with my students and kind of working with them to define what success looks like for them, but also working with the adults to figure out what does success look like […]" From listening to students, the CRP academic success component was developed where students are centered and part of creating their academic success. Teachers also described their CRP praxis defined as certain values, attitudes, and patterns of behavior that were developed. Marie expressed her attitude about cultural competence this way, "[…] it's not about me or the curriculum, that it's more about them (students)". Like Tee, Marie's developed a cultural competence that centers the student.

Theme one had two categories: CRP Component Strategies and Development of a teacher disposition for CRP teacher praxis. The three components of CRP theory: academic success, cultural competence, and critical consciousness, were developed by the teacher's strategies enacted to develop them. Teacher participants repeatedly shared the internal strategies such as reflection, self-checks of their thoughts, being opened to learning from students and others, learning about the education system, and White privilege as strategies to develop the three components of CRP. Marie and Liz, members of the focus group, spoke about having conversations with people of color in their lives to

develop their cultural competence. Liz mentioned the conversations she had with Black people in her professional life that have aided in her development of cultural competence. Liz shared, "[…] black people who are in my life and who have been part of my professional journey have been honest and open and vulnerable." In developing his critical consciousness, Michael's development strategy was "[…] looking from another person's perspective and seeing how things in the world might feel to them and how they affect them."

Tee described her critical consciousness development strategy as learning about the education system and acknowledging her self-identified privilege as a White woman. She stated:

> Learning all the, all the various ways that like being in education, which is an inherently racist system as a White woman with a privileged background, which is like an inherently, like, as, as much as I want to believe that I am not personally racist. I know that I have benefited from our racist society.

Tee went on the explain that learning about the education system to develop her critical consciousness led to using a self-reflection strategy to also develop her academic success skill. She described how she learned through reflection that her implicit bias might impact what she expects from her culturally diverse students and their learning potential (academic success). In her own words, Tee said, "[…] And like learning how, like, okay, how would my, how has my implicit bias affected my students? And you know, how have I gone into the classroom with previously held notions that I didn't even understand? You know how those kinds of things have potentially led to my students not reaching their full potential."

Participant teachers described the development of a teacher's disposition for CRP teacher praxis. The CRP disposition was described as a focus on student needs, the value of students, beliefs about power, a caring attitude, positive beliefs about culturally diverse students, and the student's abilities. Tamani described one of the values she holds as she develops her CRP, "[…] my driving force is to think about what these students need to help them to make sure that they know that we value them, we value their family. We value their background knowledge, and we want them to share that with me." Five CRP teachers described their beliefs around power and who should have it in the classroom. Solomon stated,

I believe that changing education starts with changing power structures and the way that that shows up in my feedback is that I'm, I'm trying to always think before I speak and not great at that of like, who has the power and what am I going to do about that.

Liz agreed with Solomon and added, "There's sort of like a I don't know, like a diagram of the power structures in the room running through my head when I'm giving feedback. And I'm just thinking about like where is the power in this interaction?"

Six participants described the beliefs and caring attitudes they have developed about culturally diverse students and the student's abilities. Marie communicated her belief, "I believe is that all children can achieve, but that achieved means something different to everyone. But I think that all children are capable of learning at high levels. No matter what." Mark described his care for culturally diverse students, "[…] my overall strategy for whatever I'm teaching is that I want, I want the kids to know that, that I care about them and, you know, each and every one of them and that and that builds

trust, you know? And when you have the trust of a child, that's learning, I think they learn a lot better." He also shared this sentiment, "When they know that I love them, then they'll, then that's when I feel like the best learning happens." Theme two also answered RQ1.

Under theme one is the category of CRP component strategies. Meaning the CRP teachers had a grasp of the framework and worked to develop their competency in the three components of the CRP theory (critical consciousness, cultural competence, and academic success). For example, CRP teachers described using reflection and conversations with people from other cultures to develop critical consciousness. This finding helps to answer how teachers develop their CRP and one of the ways is through becoming competent in each of the components using various strategies. Moreover, under the first theme is a teacher disposition for praxis. Meaning while CRP teachers developed the components, that development led to a teacher disposition for praxis. The development of their CRP was personal in nature. The teacher's themselves developed as evident in their values, beliefs perspectives, and behaviors. The disposition included a focus on student needs, a value of the students, certain beliefs about power, a caring attitude, positive beliefs about culturally diverse students and their student's abilities. It is both the developed CRP component skills and teacher disposition (the teacher's values, beliefs, attitudes, and accompanying behaviors) for praxis that are used in the classroom to provide feedback to students.

Theme Two—Sources of CRP Development. Theme two was supported by three categories: Self-initiated CRP development, Teacher Preparation Programs to support CRP development, and School/district Professional Development. Theme two

encompasses three sources of CRP development described by the teacher participants. The sources described were self-initiated CRP development, teacher preparation programs to support CRP development, and school/district professional development or training to support CRP development. The three sources played varying roles in the development of the teachers' CRP development. CRP teachers also described their motivation for developing their CRP. Teachers describe their motivation to include social justice work, connection to students, and survival of Black boys. As it relates to her social justice work motivation to develop her CRP, Liz shared:

> And when we're speaking specifically about, about black children, you know, so much of the educational system that we have today, or I would argue all of it was not built for them. And oftentimes intentionally not built for Black children or meant to keep black children out. So that's really where I come from is thinking about what I can do, especially as a White teacher to help rebuild education for my Black students.

> Similarly, Solomon shared, "as a White person, I came to teaching as like justice work, social justice work." Dana, a self-identified Black CRP teacher felt strongly that her CRP development was driven by a sense of responsibility to help Black boys survive in the United States. Dana stated,

> […] but black folks are in real trouble in this country. And, you know, I just feel a responsibility to help particularly black boys kind of survive the system and indeed figure out how to, I don't know if we want to thrive in it or throw it over or what, but you have to be able to, you read, you know, you just have to be able to read. And, and that's really kind of what, why I thought I would become a teacher.

The next category was Teacher Preparation Program to develop CRP. Teacher participants discussed their teacher preservice or preparation in the development of their CRP. Michael and Tasha shared how their student teaching placements helped to develop their CRP due to the location of the placements. Susan shared, "I think it was touched on," about her teacher preparation. Liz recalled one class she took in college that helped to develop her CRP, "My freshman year of college being required to take a class where we were essentially unpacking White privilege." Conversely, CRP teachers described their teacher preparation programs as unsupportive in the development of their CRP. Tee stated, "I didn't learn it. I feel like I didn't learn much through that area." Antoinette described her teacher preparation experience as not targeted for CRP development.

The final category of theme 2 is school/district CRP professional development/training. Teachers elaborated on their experiences of school/district professional development/training in the development of their CRP. CRP teachers received mixed support from school/district professional development/training. Susan was the sole teacher that shared that she received "a lot" of professional development on cultural responsiveness from her school/district. Marie credits her district with making her aware that CRP exists. Other CRP teachers shared negative, unhelpful, and problematic experiences with district/school professional development/training in the development of their CRP. Leah shared, "they have been very problematic." Trina mentioned, "Unfortunately, I don't feel like my district puts priority on that. So I've had to do this."

Theme two was supported by three categories. The most prominent source to develop CRP, was Self-initiated CRP Development. The theme is further supported by

results from the demographic questionnaire. Fourteen out of 17 CRP teachers indicated personal pursuit as a source for their CRP development (See Table 2). Within this category, CRP teachers describe the efforts they have personally undertaken to develop their CRP. During the one-on-one interviews and focus group, all 17 participants described ways in which they have personally initiated their CRP development outside of their professional setting.

Participants such as Liz described their CRP development as an ongoing journey of personal reflective practice. Liz went on to share, "I'm never feeling like I have done all the learning that there is to do. I actually feel pretty strongly that it's that it's dangerous to feel like we've, we've learned it, we've done it, we're culturally relevant." All participants in the focus group agreed that CRP development is fluid and harmful if static. Self-initiated CRP development, described by the participants, included how they sought to develop their CRP by collaborating and dialoguing with colleagues and learning from students. Mauria stated, "I'm definitely not stuck in my ways necessarily when it comes to this just, you know, constantly growing and learning and learning from the kids that they teach me the most, as far as this goes." CRP teachers sought out a like-minded community of teachers to continue to develop their CRP. Solomon discussed his strategy, "[…] build community of educators who, who are in conversation and, and working on, you know, developing this pedagogy and these skills and these practices."

In addition, CRP teachers described how their development was supported by personal experiences as culturally diverse students themselves (positive and negative), how they were reared as children or personal experiences as adults. Participants such as

Leah shared how a negative personal experience as a child helped her develop her CRP. She shared:

> So, one of my biggest things was feeling like I wasn't, like I wasn't there, like, it was no acknowledgment of the fact that I even existed in that classroom or any of my classrooms throughout my education and experience. And that's one of the main things I want to do in the classroom. I want to make sure that all my students feel seen and heard.

Dana expressed that her positive personal experiences of being able to travel to experience different cultures helped her to develop her CRP. Mark, Tane, and Trina described that his CRP development is due in part to how they were reared as children. Mark discussed how, although his family had a history with the Ku Klux Klan that his mother rejected the racist family sentiments and taught him to act differently. Mark shared, "I was raised with that kind of like, you know, knowing that basic between right and wrong, you know." Regarding her childhood, Tanae shared that she was raised to " love all people" which is described as supporting the development of her CRP.

CRP teachers discussed other self-initiated acts to develop their CRP. Participant teachers described how they developed their CRP through their reading and research on the topic. CRP teachers educated themselves by reading books and reading material through social media and social media personnel on topics related to CRP. For example, Solomon discussed, "Social media has been huge for me following specifically most of the people that I follow and learn from on social media call themselves are anti-biased, anti-racist teachers." Participants further described using their funds to pay for and attend

professional development training to develop their CRP. RQ2 was addressed by three themes.

The second theme under how teachers develop their CRP included a description of the sources of CRP development. Meaning there were three sources described by participants. The sources include self-initiated activities, school/district professional development, and teacher preparation programs. The results indicated, in response to RQ1, that CRP is developed primarily through self-initiated activities. Teachers are pursuing and learning about CRP by their own efforts. Furthermore, school/district professional development and teacher preparation programs are minimal or absent in developing CRP though the opportunity is available. This finding is further supported in the demographic data that was collected.

Research Question 2 (RQ2)—Findings

Themes three, four, and five, including their respective categories, respond to RQ2. RQ2 addressed how elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction. Theme three focused on The teacher-based context of culturally relevant feedback (CRF). Theme four addressed the use of African American culture in providing CRF. Finally, Theme five describes how corrective and disciplinary feedback is delivered to African American students during math instruction.

Theme Three—The teacher-based context of CRF. CRP teachers described the context or circumstances that form the setting for using their CRP to provide feedback to African American students during math. All CRP teachers (17 out of 17) interviewed,

and those that participated in the focus group discussed the context for provided CRF. CRP teachers discussed the following elements of the CRF context: timing and setting of CRF, teacher noticing of math misconceptions/misunderstandings, teacher's culture, consideration for feedback, teacher beliefs and practices, and the classroom community. Theme three is supported by six categories corresponding to the six elements of The teacher-based context of CRF.

The first category of the teacher-based context of CRF is timing and setting. CRP teachers described the most effective time for feedback to African American students are immediate, either one on one or in a small group. Susan attempts to provide feedback to African American students as soon as she notices the student is getting visibly upset or beginning to "shut down". Michael shared his timing and setting approach to providing feedback and shared:

> […] like the feedback, like no one wants to be called out. And I definitely don't want to call anyone out, especially if they're kind of the extreme minoritized in a situation. So times when everyone has their own tasks to do, that's when I find is the best time to pull aside and say, Hey, come here real quick. Let's talk."

Next, CRP teachers describe their noticing abilities of African American students when they have misconceptions or misunderstandings in mathematics to provide CRF. CRP teachers described the indications (verbal and/or physical) from monitoring and observing African American students to determine when feedback is needed. CRP teachers describe recognizing student behaviors such as tapping, becoming distracted, no longer working, or becoming quiet as indicators that feedback is needed. CRP teachers further described using informal math assessments or responding to an African American

student who asked for help as a way of detecting when CRF is needed. Susan noted, "They might start tapping their desks. They might start talking out loud, or they might even just start asking to go to the bathroom or asking to leave. So it's really important for me to know those visual cues."

CRP teachers described their considerations when providing feedback to African American students. The teacher considerations are a component of the teacher-based context of CRF and a category. CRP teachers describe paying considerable attention to the African American student receiving the feedback. CRP teachers also described how they account for the student's individual needs, prior educational experiences, and family scenarios when providing CRF during math instruction. CRP teachers also consider their presentation to students when providing CRF. CRP teachers discussed considerations of the tone they use with students, the words they choose, making sure that the feedback is appropriate and positive. Nissi stated, "I think one of the most important things I tried to look at where my choice of words. I considered how what I said would impact them, would it build them up or would it tear them down." Mauria also shared, "but keeping things light and positive is, is a huge thing for me."

The fourth category of the teacher-based context of CRF is the teacher's culture. CRP teachers described the awareness of the role their culture plays in providing feedback to African American students. CRP teachers indicated they apply their own lived experiences and values to their practice with African American students. CRP also discussed their value and awareness of the power dynamics because of their culture when providing feedback. In respect to power, Liz stated: "And then there's also power dynamics of being a White teacher and a black student, but that doesn't mean that they

are if that is affecting them. And I have to assume that race and racism is affecting all of us all of the time." Moreover, several African American CRP teachers described those African American students positively relate to them due to the shared culture. One CRP teacher described that African American student see her as a safe place and others shared the teacher is seen as a family member.

The fifth category of the teacher-based context of CRF are the described teacher beliefs and practices around facilitating academic success for African American students in math. CRP described their desire for all students to be successful and a belief that all students are capable. Tee shared her asset-based beliefs, "I mean, first and foremost, I believe that my students, all students, but especially, I mean, my Black students are 100% capable." CRP teacher also described their role in the academic success of African American students. Teachers described taking responsibility for student learning and creating a classroom atmosphere conducive to productive learning and equitable. Marie described her belief, "So I guess for me, it's just knowing that, that my job is to facilitate a place where all children can achieve at high levels and knowing who they are culturally in, every, in every other way only enhances that ability."

The final category under the teacher-based context of CRF is the classroom community facilitated by the teacher. The participants described the dynamics and guidelines in the classrooms that contribute to how teachers use their CRP to provide feedback to African American students. Multiple teacher participants described creating a sense of community. Solomon described the classroom community he creates,

> So it's also like, there's, there's going to be so much that I don't know, but how am
> I creating a classroom that is like open and flexible and enough for, for all of my

students to, you know, to enter it and to, to feel like you know, they can, they can come in and bring their whole selves and, and like, co-create that space too, and so you know, thinking about what are, what are the procedures and expectations that I'm setting from the beginning of the year around you know, communication and expression and how am I how am I doing that in a way that is going to be, I don't know, I, I can only think of the word welcoming.

Mauria described, "I think that, you know, creating that sense of community in my classroom has become stronger in the last couple of years, just by being more open to those types of conversations and more accepting of others and helping the kids understand acceptance more." Joyce described how community circles operate in her CRP classroom:

They come and sit down and people get a chance to speak. And everybody else has to listen. And we work out our issues. We share good news. We share things that are making us sad. We share whatever. But if they call for a circle, anyone can call for a circle. Absolutely. Anybody can call it. Absolutely. They are all a part of this community. So that means they all have the right to call it a circle, and they will, sometimes they run their own circles.

Like Joyce, Tee holds community circles, "[…] And then we kind of do every morning, we do a community circle […]" Susan described her CRP classroom, "So the biggest thing that we have is we have a community, you know, I want the students to be able to understand that we all make mistakes and I want them to be risk-takers."

CRP teacher participants described the strategies for building a supportive classroom community used to provide CRP feedback. Leah shared an idea of how

everyone in her classroom "holds" one another. She explained, "Like support them and like just bringing empowerment with like, or like give them the tools for them to feel empowered. And for them to like also to stand up for one another when they like, see these things playing out, even in a school setting."

Students in a CRP classroom possess and share power and voice in the classroom. Mark, Mauria, and Leah shared the same sentiment that students need to have a voice in the classroom. Mauria stated, "Giving them a voice in the conversation is, is a big thing for me. Leah explained that although it is complicated, she continues to work on the power structures in her classroom.

In addition, participants described their classroom environments as a place where students experience and co-create comfort, safety, and openness. Solomon stated, "[…] I kind of creating that openness from the start so that it's not just within the specific parameters that I've set, but that's, you know, students can come and kind of co-create that." Trina described how she sets up her classroom, "I think I set the classroom up like that. I think I make it so that all my students feel safe." Antoinette described her classroom environment,

> And I just want them to feel like they are seen and heard whether they are shy or they're outgoing but seen and heard in a way where it's like, you know, it's just because of their culture that they're seen and heard they're seen and heard because they can be embraced by themselves and by their teacher and, you know, get their education, and move on from there.

The first theme is the teacher-based context of CRF. Meaning, teachers describe how they take resp for creating a specific context in the classroom to provide CRF. The

context created by CRP teachers included timing and setting, teacher noticing of math misconceptions/misunderstandings, the teacher's culture, considerations for feedback, the teacher's beliefs and practices, and the classroom community. Each part of the context is employed to create the context for CRF to be provided to African American students. In terms of answering the RQ2 around how teachers use their CRP to provide feedback in mathematics, the results indicated teachers are intentionally creating a certain context through their actions, beliefs, and awareness so that CRF can be provided to African American students. RQ2 is further addressed by themes four and five.

Theme Four—African American Culture and Feedback. In theme four, teachers describe how they used their CRP and African American culture to provide CRF to African American students. The CRP teachers described the use of African American cultures through three categories: connections to the family, Black-to-Black racial congruence, and the general use of the African American culture.

Theme four is supported by three categories. The first category is connections to the family. CRP teachers described using African American culture by connecting family conversations and expectations to the feedback provided to African American students. 10 out of 17 CRP teacher participants described connecting to African American families. CRP teachers discussed connecting with families through conversations and surveys to get to know them and the students better. CRP teachers can connect with families to get a sense of the family dynamics. That information is then used in the feedback provided to African American students. Tasha shared:

> One thing that I do consider is the family dynamic. And when I say that I like to
>
> speak to the parents a lot. I'm a big proponent of calling parents. Talking helps me

to get to know how their child responds to things. Because I tell the parents, I'm like, you're the first teacher and you know them best. So you know, speaking with the parents understanding them and it also helps me to understand what's going on in their home life too.

Mauria described how she incorporated connections with families into feedback. Mauria shared:

I'll, you know, talk about a conversation that I may have had with a parent or with them just to kind of because I think when, when one African American student like, well, let me see how to work this. I think it's relevant for them to know that you know, I may not have the same conversations with all of them as frequently, but I know that if the parents could, they would probably be saying similar things. I bring those things into conversation as I teach, as far as, like, I remember when I talked to your mom and we were talking about.

CRP teachers described communicating with parents to learn the family's values or way of explaining things to bring that information into the classroom. Dana shared that she connects to African American families and culture by asking them about the stories that are shared in their families. The Black-to-Black racial congruence category also responds to RQ2.

Figure 3 provides a diagram of the Black-to-Black Racial Congruence described by the Black CRP teachers. The diagram depicts two congruent circles representing the shared identity as Black or African American. The overlap of the congruent circles indicted common ideas or values that are used between Black or African American teachers and students as a means of connection and shared understanding without explicit

instruction. The ideas and values described by participants are utilized to provide culturally relevant feedback that Black or African American students can relate or connect to based upon familiarity.

Figure 3.

Black-to-Black Racial Congruence
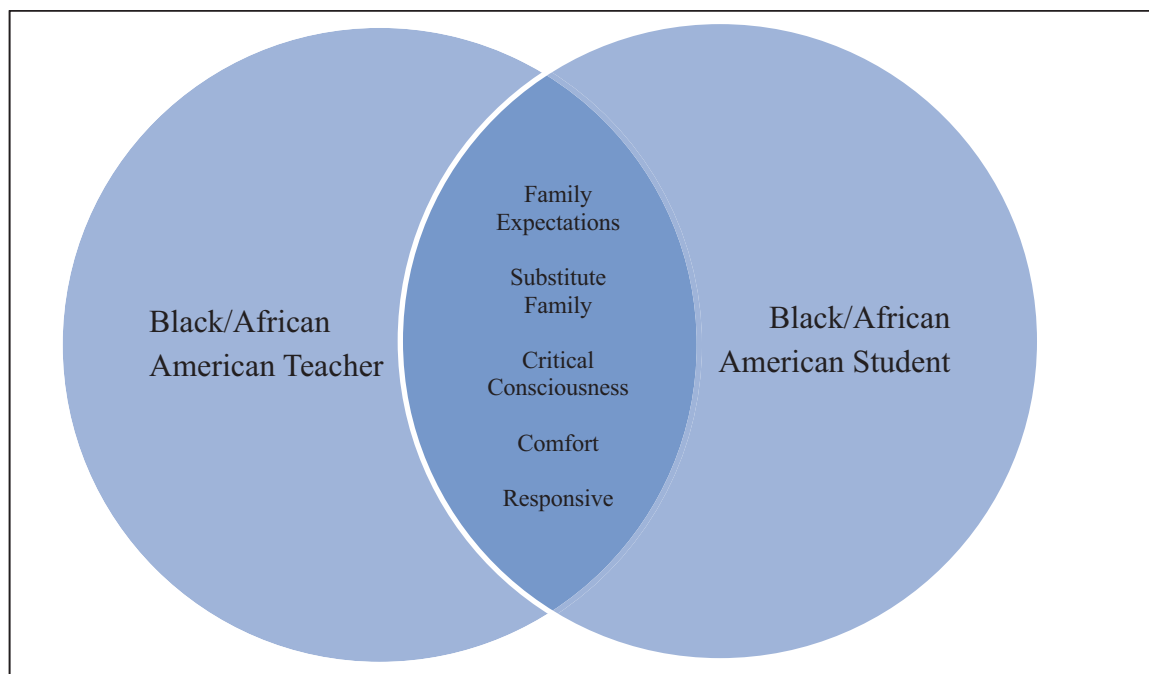
The next category described by CRP teachers was Black-to-Black racial congruence. Within this category, the self-identified Black CRP teachers describe the use of the Black-to-Black connection and relationship to provide feedback that includes familiarity, culture, code-switching, being a role model, and a sense of responsibility. Eight out of eight of the self-identified Black or African American teachers described using their shared Black experience when providing feedback to African American students.

Black or African American CRP teachers discussed being able to relate to the African American students and their family's expectations for behavior. Tamani shared,

"I will say that when I'm talking to African-Americans, I know as African-Americans we can relate like you can do this. What do you think your mother would say about this trying to basically get on their level, trying to bring up things that they can relate to?"

The Black or African American CRP teachers also described identifying with the African American students as substitute family and believed the African American students saw them the same way. Tanae shared, "So I think that my role, they see me as like a safe place. Mom, counselor […] Nissi described how she views her African American students, "I think at the heart of it, when I look at them, I see that they could be mine."

Nissi described her use of Black-to-Black racial congruence to acknowledge a shared understanding of the low expectation of African American students that some may have. She used the shared connection to encourage the African American student. Nissi stated:

> For example, I had conversations where I had to be honest and say, "look, you
>
> and I both know that there are certain people in his world who do not expect much
>
> of you, but you are in a position to change that." I wanted my culturally diverse
>
> students to know that it was essential for them to learn mathematical skills.

Joyce described how the African American students accidentally refer to her as a member of their family. Joyce stated, "You know, I have these kids call me mom sometimes by accident. They call me TT by accident. They call me grandma by accident based on who I remind them of."

Black or African American CRP teachers described how African American male students relate and are comfortable and responsive. Michael, a Black or African American male CRP teacher, shared:

I think that there's a certain level of just like seeing themselves in me, especially the males. They see themselves in me. And I'll just try to pull them aside, and one-on-one talks to them. And usually, they'll know that this is necessarily a great thing that they'll kind of have a code switch moment, you know what I mean? They code-switch when they talk to me, and when they talk to me, they're looser. And I can tell that they're more receptive to what I'm saying.

Joyce also described how African American students relate to her and are responsive due to a shared cultural understanding. Joyce explained, "And so I can get respect from a kid that other people can't get respect from simply because they see me, they see home. Right. They hear my voice, they hear home. Right. They see that look that only the right people can give and it gets somewhere, sat down." Both Michael, Antoinette, and Joyce describe how the staff, at their respective schools, recognized that the African American students responded to them.

The final category is focused on CRP teachers' general knowledge of African American culture in providing feedback to African American students. CRP teachers incorporate African American culture by not assuming the students understand the context of the math instruction and incorporate the students' experiences or names in the feedback to make the learning relevant.

CRP teachers are conscious of their African American cultural identities students and teach accordingly. CRP teachers described using different manifestations of African

American culture such as call and response, movement, rhythm, music, art, and storytelling. Nissi explained, "I was always conscious of the cultural aspect. I think it was more of me making sure I was reaching all of my students." Nissi also shared her strategy of using a technique found in African American culture,

> I would use the call and response to reiterate problem-solving strategies. Providing my students with opportunities to memorize strategies through chants, movement, rhythmic beats as part of the feedback during my math lessons. Such as, "What is the order of operations? When I say 'P' you say 'parentheses. When I say 'E', you say 'exponents."

The call and response strategy engages students in the instruction by having students repeat or echo the teacher. The strategy is commonly used in African American churches. Similarly, CRP teacher Tamani said, "I always tried to incorporate art and music. I've always tried to pull music that the students can relate to their style of music." Joyce described her use of a communication style found in African American culture that students can relate to, "And I think storytelling is really cultural. And, and so I tell a lot of stories, the kids tell me stories is how we get along. It's a natural way for things to unfold in our community. And so it's just what we do."

The second theme under RQ2 is African American culture and feedback. Meaning teachers provided descriptions of how African American culture is used to provide feedback to African American students in mathematics. Teachers described connections to the family, Black-to-Black racial congruence, and the general use of the African American culture. To answer RQ2 the findings show that CRP teachers used the information and connections made with African American families, the African

American CRP teachers utilized congruent experiences and knowledge of the African American culture with African American students, and CRP teachers used general knowledge of African American culture to provide feedback to African American students in mathematics. Theme five is the final theme that responded to RQ2.

Theme Five—Corrective or Disciplinary Feedback. Teachers described how they used their CRP to provide corrective and disciplinary (academic and behavioral) feedback is delivered to African American students, when necessary, during math instruction. Theme five is supported by two categories: Communicate care and respect and Methods of Corrective Feedback. Seventeen out of 17 teachers shared a description of how CRP is used to provide corrective/disciplinary feedback to African American students.

Care and respect took on different forms within the category. Teachers described how they used their CRP to give corrective/disciplinary feedback by demonstrating care and respect for the African American student. CRP teachers discussed providing corrections in a manner that communicated their feelings toward their students and wanted the students to care about themselves as well. Trina described her approach as a combination of care and critical consciousness. Trina stated:

So within the classroom and something is done or not done, I have told my students outside that classroom, do you understand that someone might interpret or not understand what just happened? And they're not going to be fair to you. Do you understand this? Do you understand what I'm saying to you right now? I want you to recognize that I am looking at you. We want to correct what just happened because outside of this classroom, there are people within the system who are not

going to believe you, or they may single you out. I want you to understand that. I need you to know that. And because of this, because of this, I need you to have a higher standard.

Similarly, Tasha described that she wanted her African American students to know she cared as corrective feedback was provided. She shared:

I would have to say the commonality about my disciplinary strategies is letting them know that I do care about them and they need to care about themselves too. So it's like, if you, you don't run because you will fall. I don't want you to. And I tell them, I don't want you to fall. And I don't think you want to be hurt either. So they hear that and they're like, oh, my teacher cares about me.

Nissi discussed how she learned from experience that she needed to maintain an appropriate physical distance to help the African American students feel "safe and not defensive" while also letting the students know the behavior was unacceptable. She also described that she learned, from her experience, that her African American students needed to be respected and needed to have their integrity intact. To do so, she explained, "I had suck up how I felt, forgive me for using that term. But I had to bite my words and bite my pride." Michael talked about Black girls being silenced and having their words undervalued. He used critical consciousness and acknowledged the context for Black girls that could lead them to want to lash out. Michael was empathetic, and through his corrective or disciplinary feedback, he encouraged Black girls to be proactive in speaking up for themselves but also reminded them that they needed to follow the expected behaviors. The next category was the methods used by CRP teaches to deliver corrective/disciplinary feedback through a tailored approach.

Teachers described how they used their CRP to provide a tailored approach to corrective/disciplinary feedback based on the African American students' individual needs. Tasha said, "I like to look at the individual student, what do they respond to?" Likewise, Mauria shared "It kind of looks different for each kid, to be honest with you, it's not always the same." Joyce also individualizes her corrective or disciplinary feedback, "It kind of looks different for each kid, to be honest with you, it's not always the same."

The final category involved the teacher's description of they used their CRP to deliver corrective/disciplinary feedback through private conversations with African American students. CRP teachers discussed the importance of not embarrassing African American students and engaging in a conversation to provide the student an opportunity to voice their concerns. Mauria shared, "it's usually conversational. It's like restating what I saw that they did, letting them tell me what they think I saw." Leah, Susan, and Joyce discussed having private conversations with students. Tee also has a private conversation but also provides students a chance to solve the issue for themselves. She described her proactive approach, "So if, if a student so if a black student or any, any other student was doing something behaviorally, that's disruptive, I would just come over just only. So they could hear me and say, Hey, this is a problem. I need you to solve it, give them that chance first, rather than just jumping in and being proactive." Multiple members of the focus group described how they solicit feedback from the students through questioning as part of the corrective private conversation. Solomon stated, "Also like, like folks have been saying like a big part of those conversations is also getting feedback from students.

But I don't want to, you know, start as just, here's what I'm seeing, here's what you're doing, but kind of invite more so, so I, yeah, I try to ask questions a lot."

The final theme is corrective or disciplinary feedback. Meaning CRP teachers described the approach used to provide corrective or disciplinary feedback to African American students during math instruction. CRP teachers communicate care and respect while providing the corrective or disciplinary feedback through private conversations. In terms of rq2 teachers use their CRP to provide corrective or disciplinary feedback in a way that is caring, respectful, and private when given to African American students during math instruction.

Limitations

Limitations are found within every study and cannot be controlled by the researcher (Simon & Goes, 2018). As mentioned in Chapter 1, the expected limitations of the qualitative descriptive design are within the findings that are not transferrable and applicable across CRP classrooms. The researcher also anticipated a limitation based on the sources of data and sampling strategy. The study is limited by the self-reported, unverifiable descriptions of how culturally relevant feedback is given to students. The researcher also anticipated the data sources. The study was limited by 13 in-depth interviews and one focus group conducted by the researcher. The data collected from the two methods are limited by the participants self-identifying themselves as meeting the inclusion criteria through convenience sampling. The researcher was not able to verify the accuracy and alignment of teacher training to the inclusion criteria. Therefore, the study findings are not applicable and transferable to all teachers that use CRP based on the aforementioned anticipated limitations.

In addition, the study was limited by the data analysis method. Thematic analysis, including axial and open coding, is subjective to the researcher. The researcher decides what will be coded and the definitions of those codes. In addition, the researcher created 72 codes. The amount of codes could be considered low. Data was collected using an instrument developed by the researcher. However, it is important to note that the researcher employed an expert panel and conducted a field test of the interview and focus group protocol. The researcher also implemented a reflexivity protocol which included a reflexivity log as well as peer briefing to diminish bias.

Chapter 4 contained a report of the data analysis procedures. The researcher conducted a thematic analysis using Braun and Clarke's six phases (2021) to answer two research questions. The first research question of this study was: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students? Two themes were generated from the participants' responses that addressed research question one. The first theme was CRP Component Strategies and Praxis. Theme one was supported by two categories: CRP Component Strategies and Development of a teacher disposition for CRP teacher praxis. The second theme was the Sources of CRP Development. Theme two was supported by three categories: Self-initiated Sources of CRP Development, Teacher Preparation Development, and School/district Development. The themes and categories captured a description of the participants' lived experiences.

The second research question for this study was: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction.

Three prevalent themes were generated from the participants' responses to research question two. The third theme was The teacher-based context of CRF. Theme three was supported by six categories: timing and setting of CRF, teacher noticing of math misconceptions/misunderstandings, teacher's culture, consideration for feedback, teacher beliefs and practices, and the classroom community. The fourth theme was African American Culture and Feedback. Theme four was supported by three categories: connections to the family, Black-to-Black racial congruence, and the general use of the African American culture. The fifth and final theme was corrective or disciplinary feedback. The fifth theme was supported by two categories: communicating caring and respectful feedback and methods of corrective feedback. These themes described how teachers use their CRP to provide feedback to African American students during math.

The researcher engaged in reflexivity protocols to mitigate bias. An expert panel and a field test were employed to support the trustworthiness of the study. Chapter 4 outlined the limitations of the study in the data collection, data analysis, and sampling strategy. Chapter 5 contains a detailed summary of the findings of the study. The chapter also includes implications and recommendations. In addition, the researcher provides a holistic reflection on the problem space.

Chapter 5: Summary, Conclusions, and Recommendations

Introduction and Summary of Study

According to Gjerde et al. (2018), the amount and type of feedback a student receives plays a role in academic performance. Further study was needed to understand better how teachers deliver verbal feedback (Skovholt, 2018) and examine factors that influence feedback (Schuldt, 2019). Researchers indicated the need to explore the math teacher's perspectives on providing feedback to African American students (Hill, 2018; Savage et al., 2018). Additionally, scholars called for further examination of culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018). The purpose of this qualitative descriptive study was to explore how elementary teachers described the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona.

This qualitative descriptive study was critical because African American students continue to underperform in math compared to White students (Kuhfeld et al., 2018; Paschall et al., 2018). The math underachievement of young African American males correlates with decreased high school graduation and low college matriculation rates (Kena et al., 2016). This study was significant because the conclusion and results have added to the body of knowledge on feedback and culturally relevant pedagogy. The findings of this study may also help reduce the math achievement gap for African American students. Moreover, this research can help teachers learn strategies for using

feedback to increase achievement for African American students in mathematics. Finally, teacher educators and school/district leaders can discover how to facilitate the development of culturally relevant pedagogy better.

The researcher conducted 13 in-depth interviews and one focus group virtually to collect data from, culturally relevant teachers. The data were analyzed using thematic analysis. Five themes were generated, and 16 categories resulted from the two research questions. The research questions that guided the study were:

RQ1: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students?

RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction?

Chapter 5 will provide a summary of the findings and conclusion. Practical and future implications are discussed as well as strengths and weaknesses of the study. The researcher concludes the chapter with recommendations for future research and study.

Summary of Findings and Conclusion

The purpose of this qualitative descriptive study was to explore how elementary teachers described the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction in Arizona. The sample for the study was comprised of 17 elementary teachers that use culturally relevant pedagogy. The researcher conducted 13 semi-structured interviews and one focus group to capture the teacher participants'

perspectives. The researcher generated five themes and 16 categories from data collection and data analysis. The themes and categories responded to the two research questions.

The next section will address the findings of the study organized by the research questions. The themes and categories are discussed as answers to the research questions. The findings are related to the background of the study in Chapter 1, literature review, theoretical foundation, and problem space in Chapter 2.

Overall Organization

The findings in Chapter 5 are organized by research questions. The researcher discusses each theme and category considering answering the respective research question while supporting or challenging current literature. Each theme and category are discussed in terms of advancing literature on the topic. Transferability of the study results is reviewed, connecting the findings tying them to Chapter 1. Two research questions were answered in this study:

RQ1: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students?

RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction?

Five themes and 16 categories respond to the aforementioned research questions. Themes one and two, with their corresponding categories, respond to RQ1. Themes three through five and accompanying categories respond to RQ2. Table 7 provides the research questions with corresponding themes and categories.

Table 7.

Research Questions with Corresponding Themes and Categories

Research Question	Themes	Categories
RQ1	1. CRP Component strategies and praxis	(a) CRP Component strategies (b) Development of a teacher disposition for CRP teacher praxis
RQ1	2. Sources of CRP development	(a) Self-initiated CRP development (b) Teacher preparation program to develop CRP (c) School/district training to develop CRP
RQ2	3. The teacher-based context of CRF	(a) Timing and setting of CRF (b) Teacher noticing (c) Teacher's culture (d) Consideration for feedback (e) Teacher beliefs and practices, (f) The classroom community.
RQ2	4. African American culture and feedback	(a) Connections to the family (b) Black-to-Black racial congruence (c) General use of African American culture
RQ2	5. Corrective or disciplinary feedback	(a) Communicate caring and respectful feedback (b) Methods of corrective feedback

RQ1—Themes One and Two

Theme One— CRP Component Strategies and Praxis. The focus of theme one was how teachers developed the components of CRP (cultural competence, critical consciousness, and academic success) and developed a corresponding teacher disposition for praxis which aligned to RQ1. Theme one corresponds to the background of the study where Martell and Stevens (2019) indicated that studying teachers knowledgeable of culturally relevant practices could supply models for teaching and learning, especially for historically marginalized groups of students such as African Americans. Theme one aligns with the problem space where scholars called for further examination of culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018) along with Schuldt (2019) that called for the examination of factors that influence feedback.

Theme one had two categories: CRP Component Strategies and Development of a teacher disposition for CRP teacher praxis. CRP teachers described using the following strategies to develop their academic success skills, cultural competence, and critical consciousness: collaborative conversations with students and culturally diverse people, teacher reflection, teacher self-checks of their beliefs, teacher openness to learning, a teacher looking from multiple perspectives, and the teacher learning about the history of the education system as it relates to culturally diverse students. As an example of reflection, Tee asked herself, "how has my implicit bias affected my students?" Similar to this study, Abdulrahim and Orosco (2020) focused on the use of CRP in mathematics. The teacher strategies outlined in the findings of the present study are in alignment with Abdulrahim and Orosco's (2020) findings that teacher reflection on their individual beliefs, values, and perceptions regarding race, ethnicity, and culture is an effective practice for working with culturally diverse students. The present study extends beyond Abdulrahim and Orosco's (2020) findings related to the teacher to also include more of a focus on teacher behaviors such as teacher openness to learning, a teacher looking from multiple perspectives, and the teacher learning about the history of the education system. Moreover, the strategies presented in theme one indicated how teachers described the development of their CRP, not just practices that are effective for culturally diverse students.

Teachers also described a CRP teacher praxis that was developed along with the three components of CRP in response to RQ1. One of the findings of the study was that a teacher's disposition for CRP praxis is to focus on student needs, demonstrate a value for students, hold beliefs about sharing power, possess a caring attitude, and hold positive

beliefs about culturally diverse students and their abilities. Truscott and Stenhouse (2018) used a mixed-method methodology to study CRP teachers, while this study employed a qualitative methodology. Truscott and Stenhouse (2018) and this researcher similarly found that teacher dispositions can be pedagogically specific. Moreover, the teacher disposition found in the research data aligns with cultural competence, a component of culturally relevant pedagogy theory (Ladson-Billings, 1995). Cultural competence is a construct used to measure attitudes, dispositions, values, beliefs, knowledge, and skills (Johnson et al., 2021).

Theme one answered RQ1 in that participants described developing their CRP through collaborative conversations with students and culturally diverse people, teacher reflection, teacher self-checks of their beliefs, teacher openness to learning, a teacher looking from multiple perspectives, and the teacher learning about the history of the education system as it relates to culturally diverse students. In addition, theme one answered RQ1 with a description of a teacher disposition for CRP praxis that was developed by focusing on student needs, demonstrating a value for students, holding beliefs about sharing power, possessing a caring attitude, and holding positive beliefs about culturally diverse students and their abilities.

Theme Two—Sources of CRP Development. To answer RQ1, theme two highlighted the sources of CRP development described by the CRP teachers: self-initiated CRP development, teacher preparation programs to support CRP development, and school/district professional development or training to support CRP development. Similar to theme one, theme two corresponded to the background of the study where Martell and Stevens (2019) indicated studying teachers knowledgeable of culturally relevant practices

could supply models for teaching and learning, especially for historically marginalized groups of students such as African Americans.

Theme two aligns with the problem space where scholars called for further examination of culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018). In addition, Schuldt (2019) called for the examination of factors that influence feedback.

Theme two was supported by one category, self-initiated CRP development. The findings of the study show that teacher preparation programs provide little to no support for the development of CRP. Though teacher preparation programs can foster CRP development, this study found that teacher preparation programs failed to do so. Truscott and Stenhouse (2018) found that teacher programs were able to foster specific dispositions related to pedagogy, specifically CRP tenets of academic success and cultural competence. In addition, CRP teachers described negative, unhelpful, and problematic experiences with district/school professional development/training in the development of their CRP. Notably, Trina mentioned, "Unfortunately, I don't feel like my district puts priority on that (CRP development). So I've had to do this." The sole category, self-initiated CRP development, advances the literature on the topic of CRP in that teachers are taking more leadership of their CRP development rather than the minimal offerings from school districts or teacher preparation programs as found in this study.

Overall, themes one and two answer RQ1, which focused on how elementary teachers develop their CRP. Prevalent within both themes is a clear notion of the

personalization of CRP development. Evident in the teacher disposition and strategies CRP teachers employ, the development hinges on who the teacher is in terms of values, beliefs, and behaviors. Furthermore, CRP teachers described being motivated by factors that are again personal. As further evidence, the self-initiated actions dominated the descriptions provided by the CRP teachers. CRP development is perhaps personal than professional. In comparison, theme one findings described the development of the components of CRP along with a teacher disposition for CRP praxis, while theme two addressed teacher development sources of CRP as a whole. The transferability of the CRP development findings, from themes one and two, is limited. However, with the detailed description of the participants' behavior, experiences, and context the reader can determine if the findings are transferrable (Korstjens & Moser, 2018).

RQ2—Themes Three, Four, and Five

Theme Three—The teacher-based context of CRF. Theme three is centered on the context in which CRF is delivered. To answer RQ2, teacher participants described the context that is created by teachers to use their culturally relevant pedagogy to provide feedback to African American students during math instruction. Theme three corresponds to the background of the study in that Kelcey et al. (2019) noted the relationship between teacher knowledge, instructional quality, and math achievement was mediated by factors such as the classroom context. As noted in the problem space, theme three aligns with the scholarly call for further examination of culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018).

CRP teachers discussed six categories: timing and setting of CRF, teacher noticing of math misconceptions or misunderstandings, the teacher's culture, consideration for feedback, teacher beliefs and practices, and the classroom community. Speaking about her classroom community, Antoinette said, "And I just want them to feel like they are seen and heard [...]" The teacher description indicates a value to student voice which aligns to one of the premises of CRP (Ladson-Billings, 2021). Furthermore, Whitaker and Valtierra (2018) found the disposition of community that is similar to the finding within this study. The disposition of community encompasses how the teacher structures the learning environment in such a way that values students, their families, relationships, and dialogue-driven pedagogy.

Data presented in this theme support the teacher-based context of CRF related to the timing and setting for feedback to African American students that should be delivered immediately, either one on one or in a small group. Fyfe and Rittle-Johnson's (2017) finding of immediate feedback being effective is evidenced by Susan. She stated that she provides feedback to African American students as soon as she notices the student is getting visibly upset or "shutting down." Descriptions from this study also show that feedback provided to African American students is effective when delivered privately. Wullschleger et al. (2020) sampled third-grade teachers in a longitudinal study. The researchers found that teacher feedback on incorrect social behavior was negatively associated with social acceptance during classroom activities but not during recess, and teacher feedback affects social acceptance and student collaboration (academic context). Delivering feedback privately has a social impact on elementary students, therefore, the results of this study support the findings of Wullschleger et al. (2020).

Findings related to the teacher's culture indicate that teacher participants recognize that their culture and associated power impacts students. Based on the findings of this study, CRP teachers are operating in transformative critical consciousness noted in a study of preservice teachers taught by critical pedagogues (Pollard, 2020). The transformative level of critical consciousness involves the teachers' awareness of power structures of race, class, gender, and sexual orientation within a specific domain i.e., teacher and student role in learning. A transformative level of critical consciousness is evidenced by Liz who stated: "And then there's also power dynamics of being a White teacher and a black student, but that doesn't mean that they are if that is affecting them. And I have to assume that race and racism are affecting all of us all of the time." According to Savard and Mizoguchi (2019), all people are being influenced by a variety of cultures, not just one, which in turn influences how people interpret the behavior of others. Therefore, in all classrooms, including CRP classrooms, both students and teachers are being influenced by culture.

Theme Four—African American Culture and Feedback. The findings of theme four answers RQ2. In theme four, teachers described how they used their CRP and African American culture to provide CRF to African American students. Mainly, connections to the family, Black-to-Black racial congruence, and the general use of the African American culture. Theme four corresponds to the background of the study by describing what teacher feedback to students looks like, how it is delivered, and how students respond to feedback (Skovholt, 2018) during math instruction from the teacher's perspective. As noted in the problem space, theme four also aligns with the scholarly call for further examination of culturally relevant practices in the classroom as potential

strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018). For example, Tasha said, "I do find that a lot of students who are African American they tend to be very close with their siblings, with their parents. So it is like, they love their family members to death." Based on the descriptions, CRP teachers recognize that the family is an important value in the African American culture and use it to provide feedback.

The findings for Black-to-Black racial congruence (interactions between Black or African American CRP teachers and African American students) include: (a) familiarity, (b) shared culture, (c) code-switching, (d) being a role model, (e) a sense of responsibility held by the African American teacher, (f) identifying with the African American students as substitute family and believe the African American students view the teacher same way, (g) acknowledge a shared understanding of the low expectation of African American students that some may have yet encourage despite, and (h) African American students relate and respond. Nissi shared, "I think it helps my students to see that there is someone in front of the classroom that looks like them."

General use of different manifestations to incorporate African American culture into feedback were described as (a) incorporating African American culture by not assuming the students understand the context of the math instruction, (b) incorporating the students' experiences or names in the feedback to make the learning relevant, (c) are conscious of their African American cultural identities students and teach accordingly, and (d) communicate through storytelling, rhythm, art, music, call, and response, movement. Joyce discussed, "And I think storytelling is really cultural. And, and so I tell a lot of stories, the kids tell me stories is how we get along. It's a natural way for things to

unfold in our community. And so it's just what we do." The general use of culture is supported by extant literature. Within the classroom, the internal context for teachers and students is mostly culture (Savard & Mizoguchi, 2019).

  Theme Five—Corrective or Disciplinary Feedback. To answer RQ2, teachers described how they used their CRP to provide corrective and disciplinary (academic and behavioral) feedback is delivered to African American students, when necessary, during math instruction. Similar to theme four, theme five corresponds to the background of the study by describing what teacher feedback to students looks like, how it is delivered, and how students respond to feedback (Skovholt, 2018) during math instruction from the teacher's perspective. Specifically, the findings of theme five focused on care and respect, individual student needs, and private conversations. As noted in the problem space, theme five corresponds to the scholarly call for further examination of culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018). CRP teachers conversed with students in a private manner when corrective or discipline feedback was needed. Accordingly, to Flory and Wylie (2019) found that when teachers approach students with respect, they can establish rapport with students those other teachers do not have. Moreover, a dialogic approach to feedback invites student contribution, sends a message of value for student contribution, and leads to shared responsibility in the learning process (Van Der Kleij & Adie, 2020).

  A discussion on discipline as it relates to African American students is critical. Scott et al. (2019) observed classroom interactions to examine student and teacher race as a predictor of positive or negative feedback during instruction. Black students received

disproportionately more negative feedback from both Black and White teachers when Black and White students had the same behavior. The findings of this study challenge the findings of Scott et al. (2019). The results of this study suggest that the issue with Black students receiving disproportionately more negative feedback may not be due to race but more so the teacher's pedagogical approach, praxis, and disposition as evidenced by the (Black, White, and Hispanic) CRP teachers in this study.

Themes three through five answered RQ2, which sought a description of how elementary teachers use CRP to provide feedback to African American students. Theme three findings encompass a teacher-based or teacher-facilitated context or providing CRF, while themes four and five describe how the feedback is delivered. An idea woven through all five themes is again a personal element to feedback. Scholars indicate that legitimizing the student's culture or cultural competence creates an interest in math that could improve achievement (Aronson & Laughter, 2016). Additionally, teacher feedback can strengthen or weaken a student's belief in the possibility of mastering standards (Smith et al., 2016). As such, the teacher's use of African American culture is essential to math achievement.

Reflection on the Dissertation Process

Coding. Coding was a tedious task for the researcher, and the process took longer than planned. Though Chapter 3 provided the plan for thematic analysis, the researcher had to develop coding skills. The researcher discovered that there are multiple coding methods. Throughout the coding process, the researcher's coding skills were developed. Using MAXQDA was a great tool for the coding process. During the coding process, it

became apparent to the researcher that reflexivity is important. Memoing helped the researcher to be mindful of biases.

      Thematic Analysis. Similar to the coding process, the researcher noted the tedious nature of the thematic analysis. Braun and Clarke (2021) discussed the subjectivity of reflective thematic analysis, which became apparent to the researcher during the data analysis phase. The researcher continuously meditated on what are the participants saying to go deeper and not stay at a surface level of analysis. It became clear to the researcher that the quality of the thematic analysis directly impacts the quality of codes resulting in findings.

      Emerging Researcher. Throughout the research process, the researcher developed confidence in the ability to conduct rigorous research. The researcher experienced growth in both the breadth and depth of understanding of how to conduct qualitative research. As an emerging researcher great value was found in developing chapter 3. Chapter 3 helped the researcher to craft a research plan supported by the literature.

      Recruitment. In chapter 3, the researcher using social media to recruit participants. In reflection, using social media helped to expedite the recruitment process and fit nicely with snowballing. Using social media also helped the researcher to avoid any potential COVID related delays in data collection. The researcher learned that recruitment requires consistency and persistence.

      Overall the researcher increased in the understanding of the research process. The lessons learned from recruitment being an emerging researcher, thematic analysis, and coding all seemingly work together to bring the researcher to a higher level of

understanding. In reflection, there were certainly areas of self-doubt that later turned into confidence.

Implications

      The purpose of this qualitative descriptive study was to explore how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction in Arizona. Teacher participants shared their personal experiences in developing and using their CRP to provide feedback to African American students. Implications of this study will be discussed below in terms of theoretical, practical, and future implications.

Theoretical Implications

      Regarding the development of CRP, as described in themes one and two, the findings of this study add to CRP literature. Central to the themes on development of CRP is the self-initiated efforts of CRP teachers. Teacher knowledge and skills can be developed outside of traditional or historical means such as the school district or teacher preparation programs. The first implication is that nearly 30 years after the inception of this theory, schools, districts, and institutions of higher learning are making inadequate efforts to prepare teachers to effectively support the growing number of culturally diverse students present in K-12 schools. The ideal place in rectifying the situation is not merely in the offerings to teachers but by the teacher educators themselves using CRP (Ladson-Billings, 2021).

Study findings, in themes three through five, focused on how teachers use CRP to provide feedback to African American students. CRP teachers described the teacher-based context created to provide CRF, African American culture in providing feedback, and corrective or disciplinary feedback provided to African American students during math. The findings add to scholarship by responding to a call for further study on the use of CRP and extend into the subject of mathematics of African American students (Aronson & Laughter, 2016; Polleck & Yarwood, 2020; and Twyman, 2018) and the use of a culturally inclusive approach to teaching (Yu, 2018). The results of this study demonstrate that CRP can be applied to mathematics as well as feedback. Specifically, how CRP teachers use African American culture in providing feedback to African American students. CRP teachers, in this study, were able to use African American culture in providing feedback which implies this can be applied to all minoritized students.

Practical Implications

It is evident from the results of the study that CRP teachers are motivated and driven to make learning relevant to culturally diverse students. The practical implications are how can the number of CRP teachers be increased. CRP teachers in this study described a self-initiated strategy was to collaborate and communicate with others. One implication may be that CRP communities of practice need to be intentionally created.

Classroom teachers should take note of the disciplinary or corrective feedback strategies outlined in the results. CRP teachers described using private conversations, care and respect, and focusing on individual student needs when providing disciplinary or corrective feedback to African American students. Applying these strategies may lead to

African American students having more positive experiences in the classroom and may mitigate the disproportionate amount of African American students being disciplined.

The teacher-based context for CRF is critical. The way feedback is perceived is subjective, subject-specific, and context-dependent, and individually dependent (Van Der Kleij & Adie, 2020). Teachers are at the helm of creating an environment that is conducive to the academic success of African American students. Instructional strategies alone are insufficient. A culturally relevant classroom context is central to the academic success of culturally diverse students. Teachers should consider evaluating the power dynamics in their classrooms.

In terms of how teachers develop their CRP, there is much work to be done by schools and districts as well as teacher preparation programs. The results of the study indicate there is an absence of training available for teachers. One participant described school/district CRP training as problematic and not a priority. As evident by the significant number of CRP teachers who relied on their self-initiated actions for development, teachers desire to be relevant, but the need is not being met.

Finally, there are practical implications for using African American culture. Although findings of this study indicate a shared connection of Black or African American CRP teachers with African American students, practitioners should use caution is seeking to tightly define what African American culture is. The Black diaspora is vast and equally vast are the experiences of those that identify as Black or African American. As such, practitioners should consider approaching the use of African American culture or any culture for that matter leading with respect, humility, and curiosity rather than a

predetermined assessment of what defines culture. Such assumptions could easily be defined as stereotypical and offensive.

Future Implications

CRP teachers indicated that part of their development of CRP was attributed to self-reflection, self-checks of their thoughts, being open to learning from students and others, learning about the education system, and White privilege. Future implications from this finding are to expose preservice and present teachers to the education system using a critical lens. In doing so, teachers may develop critical consciousness. Moreover, based on the inadequate help received from school/districts and teacher preparation programs to develop CRP, institutions of higher learning should consider embedding culturally relevant pedagogy into the required teacher preparation coursework.

Strengths and Weaknesses of the Study

All studies have strengths and weaknesses. This study had three strengths. The first strength was the contribution to teacher feedback literature. The second strength was the contribution to CRP literature. The last strength was the data collection process. A strength of the study was the contribution to the body of literature by examining teacher feedback that incorporates an understanding of student culture (cultural competence) and connections to race and real-world problems (socio-political/critical consciousness) (Ortiz et al., 2018) that may lead to increased math achievement (Polleck & Yarwood, 2020). The potential practical applications are that teachers may learn strategies on using feedback to increase achievement for African American students learning mathematics. An additional strength of the study was the addition to scholarship by responding to the call for further study on the use of CRP and extending into the subject of mathematics of

African American students (Aronson & Laughter, 2016; Polleck & Yarwood, 2020; and Twyman, 2018) and the use of a culturally inclusive approach to teaching (Yu, 2018).

Data collection was a strength of the study. As planned, the researcher was able to use social media to recruit 17 participants. COVID-19 impacted school districts and their willingness to allow for research. The researcher chose to use teacher Facebook groups and the researcher's social media along with snowballing to recruit participants successfully. The researcher was able to complete data collection in 21 days. Moreover, the interview and focus group protocol were reviewed by an expert panel, and a field test was conducted. Member checking was conducted to ensure the participant responses properly represented their experiences.

There were weaknesses also present in the study. First, the limitation within the methodology and design based on the use of a qualitative methodology, only a description will be provided. The findings are limited to the shared personal experiences of CRP teachers. In addition, small sample size will be used that may limit the transferability. The small size of the focus group (only four teachers) was also a weakness of the study. The small composition of the focus group was a weakness because it may have failed to provide substantially greater data than an interview with one individual. Lastly, there were limitations of the data source, which are self-reported, unverified descriptions of how culturally relevant feedback is given to students.

Recommendations

With the results of the study, the researcher offers recommendations for future research and practice. The suggestions offer an opportunity for growth and extension of this study. The purpose of this qualitative descriptive study was to explore how

elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction in Arizona. It was not known how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction. This study determined that (a) teachers developed CRP component strategies (cultural competence, critical consciousness, and academic success) and developed a teacher disposition for CRP teacher praxis, (b) teachers develop CRP mainly through self-initiated efforts, (c) CRP teachers create a teacher-based context to deliver CRF, (d) African American culture is woven into feedback, and (e) CRP teachers have a specific way of delivering corrective or disciplinary feedback to African American students.

Recommendations for Future Research

The study specifically focused on African American students and mathematics. The achievement or opportunity gap is not only applicable to African American students. Therefore, the researcher recommends that more qualitative descriptive studies be conducted centering on other marginalized groups such as Latinx, Indigenous, and those from the African diaspora. Exploring other minoritized groups may lead to findings that will address the learning gap in mathematics for those communities.

The Black-to-Black racial congruence theme outlined how Black or African American CRP teachers related to African American students in a variety of ways when using African American culture to provide feedback. From the teacher's perspective,

African American students were able to relate to them as if they were family. Exploring the lived experiences of Black or African American K-12 teachers and students through a qualitative narrative study might yield a powerful story of the connection between both minoritized teachers and minoritized students to foster greater academic success.

The participants of the study were elementary teachers. The researcher recommends a qualitative descriptive study exploring culturally relevant feedback in math at the middle and high school level, as well as the university level to see if similar results would be yielded. The findings may provide insight into how to improve the math learning outcomes for African American students at those levels. Future research is recommended to explore how university teachers and teacher preparation programs incorporate CRP and CRF into the required coursework.

Finally, the researcher recommends qualitative ethnographic research into ethnic studies pedagogy. The results of the study show how teachers use elements of African American culture, i.e., call and response, rhythm, etc. Ethnic studies encompass culturally responsive pedagogy, community-responsive pedagogy, and teacher racial identity development (Tintiangco-Cubales et al., 2014). Exploration of ethnic studies pedagogy in a real-life environment could yield findings that will improve learning outcomes for African American and other minoritized students.

Recommendations for Future Practice

This study identified strategies that teachers can use to develop their CRP as well as strategies to provide CRF to African American students. First, school/district professional development leaders should consider how they might be able to provide support to current CRP teachers. The CRP teachers in this study took the initiative to

educate and train themselves. Professional development leaders should invest in and build on what CRP teachers are doing by developing communities of practices led by CRP teachers. In doing so, teachers can collaborate and share best practices while learning from one another.

School leaders can also benefit from collaborating with CRP teachers to share the classroom context that is created. The sense of community and shared power is noteworthy. Replicating the strategies employed by CRP teachers to create such a context could have a positive school-wide effect for all students.

The results of the study point to the development of a teacher disposition for CRP teacher praxis. In the future, practitioners should consider intentionally developing their disposition for CRP. School and district leaders should consider doing the same.

Holistic reflection on the Problem Space

The researcher conducted the study to respond to the problem space identified in Chapter 2. There was a need to describe what teacher feedback to students looks like, how it is delivered, and how students respond to feedback (Skovholt, 2018) during math instruction from the teacher's perspective. Skovholt (2018) suggested that further study was needed to understand better how teachers deliver verbal feedback, and Schuldt (2019) called for the examination of factors that influence feedback. Additionally, researchers have indicated the need to explore the math teacher's perspectives on providing feedback to African American students (Hill, 2018; Savage et al., 2018). Also, scholars have called for further examination of culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al.,

2018). Therefore, the purpose of this qualitative descriptive study was to describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth-grade elementary students during math instruction. The results of this study addressed the problem space.

Savage et al. (2018) specifically called for the use of interviews of teachers to create a descriptive analysis of common practices, and Hill (2018) recommended a qualitative study on math achievement of African American boys with interviews to gather data on teacher feedback. Additionally, there was a recommendation for a study that included additional age groups (K-12) and a qualitative study where interviews are conducted to gather more data on teacher feedback. This study employed interviews and a focus group of CRP teachers that provided descriptions of their experiences through a qualitative descriptive study.

Teacher practices needed examination. Scholars recommended further study to examine teacher practices during instruction to effectively instruct African American and Hispanic American students in mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018; Savage et al., 2018). The results outlined in Chapters 4 and 5 contributed to the practices used to provide instruction to African American students. The data collected in the study led to key findings around feedback and culturally relevant pedagogy (a) CRP teachers describe the timing and setting to provide feedback to African American students, (b) CRP teachers describe how they recognize when African-American students need feedback, (c) CRP teachers describe their awareness of the impact of their culture on feedback, (d) CRP teachers describe considerations for feedback to African-American

students, (e) CRP teachers describe their beliefs and practices for the academic success of African-American students, and (f) CRP teachers describe the community built within the CRP classroom. This study provided additional insight into how teachers can provide CRF to African American students during math instruction.

The problem space called for further research to better understand how teachers give verbal feedback and what factors influence how feedback is given. The results generated two themes and three categories describing several ways elementary teachers develop their CRP to provide feedback. CRP teachers describe (a) CRP component strategies, (b) development of a teacher disposition for CRP teacher praxis, and (c) self-initiated CRP development. The results help contribute to this portion of the problem space.

Finally, the problem space called for an exploration into what feedback looks like and how it is delivered, along with an exploration of the factors that shape feedback practices within individual classrooms. Students described using African American culture in feedback through (a) connections to the family, (b) Black-to-Black racial congruence, and (c) general use of African American culture. Moreover, teachers described how corrective or disciplinary feedback is given to African American students during math instruction. The findings of this study provide descriptions of how CRF is delivered and the factors that shape feedback practices.

References

Abdulrahim, N. A., & Orosco, M. J. (2020). Culturally responsive mathematics teaching: A research synthesis. *The Urban Review, 52*(1), 1-25. https://doi.org/10.1007/s11256-019-00509-2

Adashi, E. Y., Walters, L. B., & Menikoff, J. A. (2018). The Belmont report at 40: Reckoning with time. *American Journal of Public Health*, *108*(10), 1345-1348.

Adler-Greene, L. (2019). Every Student Succeeds Act: Are schools making sure every student succeeds? *Touro Law Review*, *1*, 1-14.

Alfaro, C. (2019). Preparing critically conscious dual-language teachers: Recognizing and interrupting dominant ideologies. *Theory Into Practice, 58*(2), 194–203. https://doi.org/10.1080/00405841.2019.1569400

Allen, C. (2017). *Crime, drugs, and social theory: A phenomenological approach*. Routledge.

Allen, S. (2008). Eradicating the achievement gap: History, education, and reformation. *Black History Bulletin*, *71*(1), 13-17.

Allensworth, E., Cashdollar, S., & Gwynne, J. (2021). Improvements in math instruction and student achievement through professional learning around the common core state standards in Chicago. *AERA Open*, *7*. https://doi.org/10.1177/2332858420986872

Amador, J. M., Bragelman, J., & Superfine, A. C. (2021). Prospective teachers' noticing: A literature review of methodological approaches to support and analyze noticing. *Teaching and Teacher Education*, *99*, 1-16. https://doi.org/10.1016/j.tate.2020.103256

Anguera, M. T., Blanco-Villaseñor, A., Losada, J. L., Sánchez-Algarra, P., &
Onwuegbuzie, A. J. (2018). Revisiting the difference between mixed methods and
multimethod: Is it all in the name? *Quality & Quantity*, *52*(6), 2757-2770.

Aronson, B., & Laughter, J. (2016). The theory and practice of culturally relevant
education: A synthesis of research across content areas. *Review of Educational
Research, 86*(1), 163-206. https://doi.10.3102/0034654315582066

Asiamah, N., Mensah, H. K., & Oteng-Abayie, E. (2017). General, target, and accessible
population: Demystifying the concepts for effective sampling. *The Qualitative
Report, 22*(6), 1607-162.

Assari, S., Mardani, A., Maleki, M., Boyce, S., & Bazargan, M. (2021). Black-white
achievement gap: Role of race, school urbanity, and parental education. *Pediatric
Health, Medicine and Therapeutics*, *12*, 1-11.
https://doi.org/10.2147/phmt.s23887

Austin, Z., & Sutton, J. (2014). Qualitative research: Getting started. *The Canadian
Journal of Hospital Pharmacy*, *67*(6), 436-440.
https://doi.org/10.4212/cjhp.v67i6.1406

Baillie, L. (2019). Exchanging focus groups for individual interviews when collecting
qualitative data. *Nurse Researcher*, *27*(2), 15-
20. https://doi.org/10.7748/nr.2019.e1633

Baran, M. (2010). Teaching multi-methodology research courses to doctoral
students. *International Journal of Multiple Research Approaches*, *4*(1), 19-27.

Battey, D. (2013a). "Good" mathematics teaching for students of color and those in
poverty: The importance of relational interactions within instruction. *Educational*

Studies in Mathematics, 82(1), 125–144. https://doi-

org.lopes.idm.oclc.org/10.1007/s10649-012-9412-z

Battey, D. (2013b). Access to mathematics: "A possessive investment in

whiteness". *Curriculum Inquiry*, *43*(3), 332-359.

Battey, D., Leyva, L. A., Williams, I., Belizario, V. A., Greco, R., & Shah, R. (2018).

Racial (mis) match in middle school mathematics classrooms: Relational

interactions as a racialized mechanism. *Harvard Educational Review, 88*(4), 455-

482.

Battey, D., & Neal, R. A. (2018). Detailing relational interactions in urban elementary

mathematics classrooms. *Mathematics Teacher Education and Development,*

20(1), 23-42.

Berger, R. (2015). Now I see it, now I don't: Researcher's position and reflexivity in

qualitative research. *Qualitative Research*, *15*(2), 219-234.

Black, P., & William, D. (2018). Classroom assessment and pedagogy. *Assessment in*

Education: Principles, Policy & Practice, *25*(6), 551-575.

Blackburn, F. (2020). Cultural competence: Toward a more robust conceptualization.

Public Library Quarterly, 39(3), 229–245. https://doi-

org.lopes.idm.oclc.org/10.1080/01616846.2019.1636750

Blair, E. (2015). A reflexive exploration of two qualitative data coding

techniques. *Journal of Methods and Measurement in the Social Sciences*, *6*(1), 14-

29. https://doi.org/10.2458/v6i1.18772

Bourke, B. (2014). Positionality: Reflecting on the research process. *The Qualitative*

Report, 1-9. https://doi.org/10.46743/2160-3715/2014.1026

Bracken, W., & Wood, J. L. (2019). Examining the Mirror Effect: Culturally Relevant

    Images in a Testing Environment. *Western Journal of Black Studies*, *43*(1), 1-8.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative*

    Research in Psychology, 3(2), 77-101.

    https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. Sage.

Braun, V., Clarke, V., & Hayfield, N. (2019). 'A starting point for your journey, not a

    map': Nikki hayfield in conversation with Virginia Braun and Victoria Clarke

    about thematic analysis. *Qualitative Research in Psychology*, 1-

    22. https://doi.org/10.1080/14780887.2019.1670765

Brooks, S. D. (2018). Cultural competence, race, and gender: Portraits of teaching in high

    school college access programs. *The High School Journal, 101*(3), 177-198.

    https://doi.org/10.1353/hsj.2018.0009

Brown, B. A., Boda, P., Lemmi, C., & Monroe, X. (2018). Moving culturally relevant

    pedagogy from theory to practice: Exploring teachers' application of culturally

    relevant education in science and mathematics. *Urban Education*, *54*(6), 775-

    803. https://doi.org/10.1177/0042085918794802

Bullough, R. V., Jr. (2019). Empathy, teaching dispositions, social justice, and teacher

    education. *Teachers and Teaching, 25*(5), 507-522.

    https://doi.org/10.1080/13540602.2019.1602518

Byrne, D. (2017). Data analysis and interpretation. *Project Planner*.

    https://doi.org/10.4135/9781526408570

Candela, A. G. (2019). Exploring the function of member checking. *The Qualitative Report*, *24*(3), 619-628. https://doi.org/10.46743/2160-3715/2019.3726

Carcary, M. (2009). The research audit trial—enhancing trustworthiness in qualitative inquiry. *Electronic Journal of Business Research Methods*, *7*(1), 11-24.

Carcary, M. (2020). The research audit trail: Methodological guidance for application in practice. *Electronic Journal of Business Research Methods*, *18*(2), 166-177. https://doi.org/10.34190/JBRM.18.2.008

Carless, D., Salter, D., Yang, M., & Lam, J. (2011). Developing sustainable feedback practices. *Studies in Higher Education*, *36*(4), 395–407. https://doi.org/10.1080/03075071003642449

Chun Tie, Y., Birks, M., & Cross Francis, K. (2019). Grounded theory research: A design framework for novice researchers. *SAGE Open Medicine*, *7*. https://doi.org/10.1177/2050312118822927

Clarke, V., & Braun, V. (2013). *Successful qualitative research: A practical guide for beginners.* Sage. http://eprints.uwe.ac.uk/21156.

Clarke, V., & Braun, V. (2016). Thematic analysis. *The Journal of Positive Psychology*, *12*(3), 297-298. https://doi.org/10.1080/17439760.2016.1262613

Cram, B., & Alkadry, M. (2018). Virtue ethics and cultural competence: Improving service one administrator at a time. *Journal of Public Affairs Education, 24*(4), 518-537. https://doi.org/10.1080/15236803.2018.1484652.

Cunningham, C. T., Quan, H., Hemmelgarn, B., Noseworthy, T., Beck, C. A., Dixon, E., & Jetté, N. (2015). Exploring physician specialist response rates to web-based

surveys. *BMC Medical Research Methodology*, *15*(1), 1-8.

https://doi.org/10.1186/s12874-015-0016-z

De Kleijn, R., & Van Leeuwen, A. (2018). Reflections and review on the audit

procedure: Guidelines for more transparency. *International Journal of Qualitative

Methods*, *17*(1), https://doi.org/1609406918763214.

Diemer, M. A., Pinedo, A., Bañales, J., Mathews, C. J., Frisby, M. B., Harris, E. M., &

McAlister, S. (2021). Recentering action in critical consciousness. *Child

Development Perspectives, 15*(1), 12-17. https://doi.org/10.1111/cdep.12393

Dodman, S. L., Swalwell, K., DeMulder, E. K., View, J. L., & Stribling, S. M. (2021).

Critical data-driven decision making: A conceptual model of data use for

equity. *Teaching and Teacher Education, 99*.

https://doi.org/10.1016/j.tate.2020.103272.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling

and purposive sampling. *American Journal of Theoretical and Applied

Statistics*, *5*(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11

Firestone, W. A. (1993). Alternative arguments for generalizing from data as applied to

qualitative research. *Educational researcher*, *22*(4), 16-23.

https://doi.org/10.3102/0013189X022004016

Flory, S. B., & Wylie, R. A. (2019). Cultural competence of urban middle school

physical education teachers. *Physical Educator, 76*(5), 1319-1341.

https://doi.org/10.18666/TPE-2019-V76-I5-9131

Freire, J. (2020). Promoting sociopolitical consciousness and bicultural goals of dual

language education: The transformational dual language educational framework.

Journal of Language, Identity & Education, 19(1), 56-71.

https://doi.10.1080/15348458.2019.1672174.

Frey, B. B. (2018). *The SAGE encyclopedia of educational research, measurement, and evaluation (Vols. 1-4)*. SAGE Publications, Inc.

https://doi.org/10.4135/9781506326139

Fusch, P. I., & Ness, L. R. (2015). Are we there yet? Data saturation in qualitative research. *The Qualitative Report*, *20*(9), 1408-1416.

https://doi.org/10.46743/2160-3715/2015.2281

Fyfe, E. R., & Rittle-Johnson, B. (2017). Mathematics practice without feedback: A desirable difficulty in a classroom setting. *Instructional Science, 45(*2), 177-180.

https://doi.org/10.1007/s11251-016-9401-1.

Gamlem, S. M., Kvinge, L. M., Smith, K., Engelsen, K. S., & Hansen, V. L. (2019). Developing teachers' responsive pedagogy in mathematics, does it lead to short-term effects on student learning? *Cogent Education, 6*(1), 1-18.

https://doi.org/10.1080/2331186X.2019.1676568

Garneau, A. B., & Pepin, J. (2015). Cultural competence: A constructivist definition. *Journal of Transcultural Nursing*, *26*(1), 9-15.

https://doi.org/10.1177/1043659614541294

Ghaljaie, F., Naderifar, M., & Goli, H. (2017). Snowball sampling: A convenience method of sampling in qualitative research. *Strides in Development of Medical Education*, *14*(3), 1-4. https://doi.org/10.5812/sdme.67670

Giorgi, A. (2014). An affirmation of the phenomenological psychological descriptive method: A response to Rennie (2012). https://doi.org/10.1037/met0000015

Gjerde, K. A. P., Skinner, D., & Padgett, M. Y. (2018). Feedback effectiveness: Is it what you say or how much you say it? *Journal of Higher Education Theory & Practice*, *18*(3), 26–43. https://doi.org/10.33423/jhetp.v18i3.556

Godfrey, E. B., & Burson, E. (2018). Interrogating the intersections: How intersectional perspectives can inform developmental scholarship on critical consciousness., Envisioning the integration of an intersectional lens in developmental science. *New Directions for Child and Adolescent Development, 161*, 17-38. https://doi.org/10.1002/cad.20246

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods 18*(1), 59-82. https://doi.org/10.1177/1525822X05279903.

Hadi, M. A., & Closs, J. S. (2015). Ensuring rigor and trustworthiness of qualitative research in clinical pharmacy. *International Journal of Clinical Pharmacy*, *38*, 641–646. https://doi.org/10.1007/s11096-015-0237-6

Hanushek, E. A., Peterson, P. E., Talpey, L. M., & Woessmann, L. (2019). The achievement gap fails to close. *Education Next*, *19*(3), 8-17.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81–112. https://doi.org/10.3102/003465430298487

Henry, P. (2015). Rigor in qualitative research: Promoting quality in social science research. *Res J Recent Sci ISSN*, *2277*, 2502.

Hill, S. (2018). *An examination of factors associated with the achievement of middle school African American males in mathematics* [Unpublished dissertation]. Clark Atlanta University.

Hilton, C. E. (2017). The importance of pretesting questionnaires: a field research

    example of cognitive pretesting the Exercise referral Quality of Life Scale (ER-

    QLS). *International Journal of Social Research Methodology*, *20*(1), 21-34.

    https://doi.org/10.1080/13645579.2015.1091640

Hodge, L. L., & Cobb, P. (2019). Two views of culture and their implications for

    mathematics teaching and learning. *Urban Education, 54*(6), 860-884.

    https://doi.org/10.1177%2F0042085916641173

Howansky, K., Maimon, M., & Sanchez, D. (2021). Identity safety cues predict instructor

    impressions, belonging, and absences in the psychology classroom. *Teaching of*

    Psychology, https://doi.org/0098628321990362.

Howell, D., Norris, A., & Williams, K. L. (2019). Towards black gaze theory: How black

    female teachers make black students visible. *Urban Education Research & Policy*

    Annuals, 6(1), 20-30.

Huang Ju, & Shijing XU. (2015). A narrative inquiry into Chinese teacher induction in

    West China through cross-cultural teacher development. *Frontiers of Education in*

    China, 10(3), 470–492. https://doi.org/10.1007/BF03397080

Hyrkäs, K., Appelqvist-Schmidlechner, K., & Oksa, L. (2003). Validating an instrument

    for clinical supervision using an expert panel. *International Journal of nursing*

    studies, *40*(6), 619-625. https://doi.org/10.1016/S0020-7489(03)00036-1

Jackson, I., & Knight-Manuel, M. (2019). Color does not equal consciousness: Educators

    of color learning to enact a sociopolitical consciousness. *Journal of Teacher*

    Education, 70(1), 65-78. https://doi.org/10.1177/0022487118783189

Jacob, S., & Furgerson, S. (2012). Writing interview protocols and conducting

interviews: Tips for students new to the field of qualitative research. *The*

Qualitative Report, *17*(6), 1-10. https://doi.org/10.46743/2160-3715/2012.1718

Jenkins, K., & Rojas, R. (2020). Developing cultural competence from a funds of

knowledge framework: Ethnographic interviewing revisited. *Perspectives of the*

ASHA Special Interest Groups, 5(6), 1683–1686.

https://doi.org/10.1044/2020_PERSP-20-00081.

Jeynes, W. H. (2015). A meta-analysis on the factors that best reduce the achievement

gap. *Education and Urban Society*, *47*(5), 523-554.

Johnson, J. L., Adkins, D., & Chauvin, S. (2019). A review of the quality indicators of

rigor in qualitative research. *American Journal of Pharmaceutical*

Education, *84*(1), 138-146. https://doi.org/10.5688/ajpe7120

Johnson, C. S., Sdunzik, J., Bynum, C., Kong, N., & Qin, X. (2021). Learning about

culture together: Enhancing educators' cultural competence through collaborative

teacher study groups. *Professional Development in Education*, *47*(1), 177-

190. https://doi.org/10.1080/19415257.2019.1696873

Kelcey, B., Hill, H. C., & Chin, M. J. (2019). Teacher mathematical knowledge,

instructional quality, and student outcomes: a multilevel quantile mediation

analysis. *School Effectiveness and School Improvement*, *30*(4), 398-431.

https://doi.org/10.1080/09243453.2019.1570944.

Kena, G., Hussar, W., McFarland, J., de Brey, C., Musu-Gillette, L., Wang, X., Zhang, J.,

Rathburn, A., Wilkinson-Flicker, S., Dilberti, M., Barmer, A., Bullock Mann, F.,

& Dunlop Velez, E. (2016). The condition of education 2016. NCES 2016-

144. *National Center for Education Statistics*.

Kerr, J., & Andreotti, V. (2019). Crossing borders in initial teacher education: mapping

dispositions to diversity and inequity. *Race Ethnicity and Education, 22*(5), 647-

665.https://doi.org/10.1080/13613324.2017.1395326.

Kilic, H. (2018). Pre-service mathematics teachers' noticing skills and scaffolding

practices. *International Journal of Science & Math Education, 16*(2), 377-400.

https://doi.org/10.1007/s10763-016-9784-0.

Kohli, R., Lin, Y. C., Ha, N., Jose, A., & Shini, C. (2019). A way of being: Women of

color educators and their ongoing commitments to critical consciousness.

Teaching and Teacher Education, 82, 24-32.

https://doi.org/10.1016/j.tate.2019.03.005.

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part

4: Trustworthiness and publishing, *European Journal of General

Practice, 24*(1), 120-124. https://doi.org/10.1080/13814788.2017.1375092

Kotok, S. (2017). Unfulfilled potential: High achieving minoritized students and the high

school achievement gap in math. *The High School Journal*, *100*(3), 183–202.

https://doi.org/10.1353/hsj.2017.0007.

Kuhfeld, M., Gershoff, E., & Paschall, K. (2018). The development of racial/ethnic and

socioeconomic achievement gaps during the school years. *Journal of Applied

Developmental Psychology*, *57*, 62-

73. https://doi.org/10.1016/j.appdev.2018.07.001

Ladson-Billings, G. (1997). *The dreamkeepers: Successful teaching for African American students*. Jossey-Bass.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, *32*(3), 465-491.

Ladson-Billings, G. (2021). Three decades of culturally relevant, responsive, & sustaining pedagogy: What lies ahead? *The Educational Forum*, *85*(4), 351-354. https://doi.org/10.1080/00131725.2021.1957632

LaForett, D. R., & De Marco, A. (2020). A logic model for educator-level intervention research to reduce racial disparities in student suspension and expulsion. *Cultural Diversity and Ethnic Minoritized Psychology, 26*(3), 295–305. https://doi.org/10.1037/cdp0000303.

Lambert, V. A., & Lambert, C. E. (2012). Qualitative descriptive research: An acceptable design. *Pacific Rim International Journal of Nursing Research*, *16*(4), 255-256.

Larkin, D. B., & Hannon, L. V. (2019). Preparing teachers for students in juvenile justice settings. *Contemporary Justice Review*, *23*(4), 475-499. https://doi.org/10.1080/10282580.2019.1700374

Lasater, K., Bengtson, E., & Albiladi, W. S. (2021). Data use for equity?: How data practices incite deficit thinking in schools. *Studies in Educational Evaluation*, *69*, 1-10. https://doi.org/10.1016/j.stueduc.2020.100845

Lauri, M. A. (2019). WASP (Write a scientific paper): Collecting qualitative data using focus groups. *Early Human Development*, *133*, 65-68. https://doi.org/10.1016/j.earlhumdev.2019.03.015

Lee, M. Y., & Cross Francis, D. (2018). Investigating the relationships among elementary teachers' perceptions of the use of students' thinking, their professional noticing skills, and their teaching practices. *The Journal of Mathematical Behavior*, *51*, 118-128. https://doi.org/10.1016/j.jmathb.2017.11.007

Levitt, H. M., Pomerville, A., & Surace, F. I. (2016). A qualitative meta-analysis examining clients' experiences of psychotherapy: A new agenda. *Psychological Bulletin*, *142*(8), 801-830. https://doi.org/10.1037/bul0000057

Lorenza, B. (2018). Awareness, analysis, engagement: critical consciousness through foster youth advisory board participation. *Child & Adolescent Social Work Journal, 35*(2), 119–126. https://doi.org/10.1007/s10560-017-0515-3.

Louie, N. L. (2018). Culture and ideology in mathematics teacher noticing. *Educational Studies in Mathematics, 97*(1), 55-69. https://doi.10.1007/s10649-017-9775-2.

Macqueen, S. E., Reynolds, R., & Ferguson-Patrick, K. (2020). Investigating the cultural competence of preservice teachers: Comparisons and considerations. *Journal of International Social Studies, 10*(1), 113–137.

Maddamsetti, J. (2020). Cultivating culturally relevant and sustaining pedagogy through field experiences: Discourses of elementary preservice teachers of color. *The New Educator*, *16*(4), 352-375. https://doi.org/10.1080/1547688x.2020.1810374

Markey, K., Ventura, C. A., Donnell, C. O., & Doody, O. (2020). Cultivating ethical leadership in the recovery of COVID-19. *Journal of Nursing Management*, *29*(2), 351-355. https://doi.org/10.1111/jonm.13191

Martell, C. C., & Stevens, K. M. (2019). Culturally sustaining social studies teachers: Understanding models of practice. *Teaching and Teacher Education*, *86*, 1-11. https://doi.org/10.1016/j.tate.2019.102897

Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. In *Forum qualitative Sozialforschung/Forum: Qualitative social Research*,11(3),1-19.

McGrath, C., Palmgren, P. J., & Liljedahl, M. (2018). Twelve tips for conducting qualitative research interviews. *Medical Teacher*, *41*(9), 1002-1006. https://doi.org/10.1080/0142159x.2018.1497149

McIntosh, M. J., & Morse, J. M. (2015). Situating and constructing diversity in semi-structured interviews. *Global Qualitative Nursing Research*, *2*, 1-10. https://doi.org/10.1177/2333393615597674

Mensah, F. M. (2021). Culturally relevant and culturally responsive. *Science and Children*, *58*(4), 1-4.

Monteiro, V., Mata, L., Santos, N., Sanches, C., & Gomes, M. (2019). Classroom talk: The ubiquity of feedback. *Frontiers in Education*, *4*. https://doi.org/10.3389/feduc.2019.00140

Mosley, D. V., Hargons, C. N., Meiller, C., Angyal, B., Wheeler, P., Davis, C., & Stevens-Watkins, D. (2021). Critical consciousness of anti-Black racism: A practical model to prevent and resist racial trauma. *Journal of Counseling Psychology, 68(*1), 1-16. https://doi.org/10.1037/cou0000430

Munter, C., & Haines, C. (2019). Mathematics teachers' enactment of cognitively demanding tasks and students' perception of racial differences in

opportunity. *Mathematical Thinking and Learning*, *21*(3), 155-177.

https://doi.org/10.1080/10986065.2019.1576002

Neergaard, M. A., Olesen, F., & Andersen, R. (2009). Qualitative description – the poor

cousin of health research? *BMC Med Res Methodol, 9*(52), 1-5.

https://doi.org/10.1186/1471-2288-9-52

Nojan, S. (2020). Why ethnic studies? Building critical consciousness among middle

school students. *Middle School Journal, 51*(2), 25-35.

https://doi.org/10.1080/00940771.2019.1709259.

Onwuegbuzie, A. J., Dickinson, W. B., Leech, N. L., & Zoran, A. G. (2009). A

qualitative framework for collecting and analyzing data in focus group

research. *International Journal of Qualitative Methods*, *8*(3), 1-

21. https://doi.org/10.1177/160940690900800301

Ortiz, N. A., Capraro, M. M., & Capraro, R. M. (2018). Does it really matter? Exploring

cultural relevance within a majority White classroom. *Journal of Negro*

Education, *87*(4), 404-419. https://doi.org/10.7709/jnegroeducation.87.4.0404

Osher, D., Cantor, P., Berg, J., Steyer, L., & Rose, T. (2020). Drivers of human

development: How relationships and context shape learning and development.

Applied Developmental Science, 24(1), 6-36.

https://doi.org/10.1080/10888691.2017.1398650

Oxford, R. L., & Gkonou, C. (2018). Interwoven: Culture, language, and learning

strategies. *Studies in Second Language Learning and Teaching, 8*(2), 403-

426.https://doi.10.14746/ssllt.2018.8.2.10

Padua, J., & Gonzalez Smith, M. (2020). Intercultural communicative competence in

    teacher education: Cultural simulation insights from Hawai'i. *IAFOR Journal of*

    Education, 8(3), 59-76. https://doi.org/10.22492/ije.8.3.04

Palmer, C. B. (2020). *The relationship between autonomy, competence, and relatedness*

    and teachers' length of service (Publication No. 27996038) [Doctoral dissertation,

    Grand Canyon University]. ProQuest Dissertations and Theses Global.

Paris, D. (2012). Culturally sustaining pedagogy: A needed change in stance,

    terminology, and practice. *Educational researcher*, *41*(3), 93-97.

    https://doi.org/10.3102%2F0013189X12441244.

Park, J., & Park, M. (2016). Qualitative versus quantitative research methods: discovery

    or justification? *Journal of Marketing Thought*, *3*(1), 1–7.

    https://doi.org/10.15577/jmt.2016.03.01.1

Paschall, K. W., Gershoff, E. T., & Kuhfeld, M. (2018). A two-decade examination of

    historical race/ethnicity disparities in academic achievement by poverty

    status. *Journal of Youth and Adolescence*, *47*(6), 1164-1177.

Patterson-Williams, A. D., Higgs, J. M., & Athanases, S. Z. (2020). Noticing for equity to

    sustain multilingual literacies. *Journal of Adolescent & Adult Literacy, 63*(4),

    457-461. https://doi.10.1002/jaal.1025.

Patton, M. Q. (2015). *Qualitative evaluation and research methods.* Sage.

Polit, D. F., & Beck, C. T. (2010). Generalization in quantitative and qualitative research:

    Myths and strategies. *International Journal of Nursing Studies*, *47*(11), 1451-

    1458. https://doi.org/10.1016/j.ijnurstu.2010.06.004

Polkinghorne, D. E. (2005). Language and meaning: Data collection in qualitative research. *Journal of Counseling Psychology*, *52*(2), 137-145. https://doi.org/10.1037/0022-0167.52.2.137

Pollard, B. (2020). Exploring the impact of critical pedagogy: Do preservice teachers develop critical consciousness when taught by critical pedagogues*? Canadian Journal of Action Research, 20*(3), 74-100. https://doi.org/10.33524/cjar.v20i3.466.

Polleck, J., & Yarwood, J. (2020). Putting students at the center: Empowering urban alternative education teachers through culturally relevant and sustaining unit planning. *Preventing School Failure: Alternative Education for Children and Youth*, *64*(3), 191-200. https://doi.org/10.1080/1045988x.2020.1716675

Protheroe, N. (2007). What does good math instruction look like? *Principal*, *87*(1), 51-54.

Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the Nutrition Society*, *63*(4), 655-660. https://doi.org/10.1079/pns2004399

Rahman, M. S. (2016). The advantages and disadvantages of using qualitative and quantitative approaches and methods in language "Testing and assessment" research: A literature review. *Journal of Education and Learning*, *6*(1), 102-112. https://doi.org/10.5539/jel.v6n1p102

Rutherford, A. (2018). Feminism, psychology, and the gendering of neoliberal subjectivity: From critique to disruption. *Theory & Psychology*, *28*(5), 619-644. https://doi.org/10.1177/0959354318797194

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health*, *23*(4), 334-340. https://doi.org/10.1002/1098-240x(200008)23:4<334::aid-nur9>3.0.co;2-g

Sauermann, H., & Roach, M. (2013). Increasing web survey response rates in innovation research: An experimental study of static and dynamic contact design features. *Research Policy*, *42*(1), 273-286. https://doi.org/10.1016/j.respol.2012.05.003

Savage, D., Tsemenhu, R., Green, R., Truby, W., & Stelzer, J. (2018). Implementation of common core state standards for mathematics with African American and Hispanic American students: Successful common practices. *National Teacher Education Journal*, *11*(2), 75–87.

Savard, I., & Mizoguchi, R. (2019). Context or culture: What is the difference?. *RPTEL, 14*, 23-28. https://doi.org/10.1186/s41039-019-0112-5.

Schofield, M., & Jamieson, M. (1999). Sampling in quantitative research. In V. Minichiello, G. Sullivan, K. Greenwood, & R. Axford (Eds.), *Handbook of research methods in health sciences* (pp. 147-172). Addison-Wesley.

Schuldt, L. C. (2019). Feedback in action: Examining teachers' oral feedback to elementary writers. *Teaching and Teacher Education*, *83*, 64-76. https://doi.org/10.1016/j.tate.2019.03.020

Scott, C., & Medaugh, M. (2017). Axial coding. *The International Encyclopedia of Communication Research Methods*, *10*. https://doi.org/10.1002/9781118901731.iecrm0012

Scott, T. M., Gage, N., Hirn, R., & Han, H. (2019). Teacher and student race as a

    predictor for negative feedback during instruction. *School Psychology*, *34*(1), 22-

    31. https://doi.org/10.1037/spq0000251

Seider, S., Graves, D., El-Amin, A., Soutter, M., Tamerat, J., Jennett, P., Clark, S.,

    Malhotra, S., & Johannsen, J. (2018). Developing sociopolitical consciousness of

    race and social class inequality in adolescents attending progressive and no

    excuses urban secondary schools. *Applied Developmental Science*, *22*(3), 169–

    187. https://doi:10.1080/10888691.2016.1254557.

Shih, Y. H. (2018). Rethinking Paulo Freire's dialogic pedagogy and its implications for

    teachers' teaching. *Journal of Education and Learning, 7*(4), 130-235.

    https://doi.org/10.5539/jel.v7n4p230.

Simon, M. K., & Goes, J. (2018). *Dissertation and scholarly research: Recipes for*

    success: A practical guide to start and complete your dissertation, thesis, or

    formal research project (18th ed.). Dissertation Success.

Sinclair, K. (2019). Unsettling discourses of cultural competence. *Journal of Childhood*

    Studies, 44(4), 36-46. https://doi.org/10.18357/jcs444201919210.

Skovholt, K. (2018). Anatomy of a teacher–student feedback encounter. *Teaching and*

    Teacher Education, *69*, 142-153. https://doi.org/10.1016/j.tate.2017.09.012

Smith, K., Gamlem, S. M., Sandal, A. K., & Engelsen, K. S. (2016). Educating for the

    future: A conceptual framework of responsive pedagogy. *Cogent Education*, *3*(1),

    1-12. https://doi.org/10.1080/2331186x.2016.1227021

Souto-Manning, M., Llerena, L. C., Martell, J., Maguire, S. A., Arce-Boardman, A.,

      Duke, N. K., & Keene, E. O. (2018). *No more culturally irrelevant teaching (not*

      this but that). Heinemann.

Stephens, K. R. (2019). Teacher dispositions and their impact on implementation

      practices for the gifted. *Gifted Child Today*, *42*(4), 187-

      195. https://doi.org/10.1177/1076217519862330

Sturdivant, T. D., & Alanís, I. (2019). Teaching through culture. *Journal for*

      Multicultural Education, 13(3), 203-214. https://doi.org/10.1108/JME-03-2019-

      0019.

Styslinger, M. E., Stowe, J., Walker, N., & Hyatt Hostetler, K. (2019). Becoming

      teachers for social justice: Raising critical consciousness. *The Clearing House: A*

      Journal of Educational Strategies, Issues, and Ideas, *92*(1-2), 9-

      14. https://doi.org/10.1080/00098655.2018.1533797

Tate, W. F. (1995). Returning to the root: A culturally relevant approach to mathematics

      pedagogy. *Theory into Practice*, *34*(3), 166-173.

Taylor, K. B. (2021). Exploring the complexities of peer interactions in fostering

      development toward critical consciousness. *Journal of Diversity in Higher*

      Education, *14*(1), 50-62. https://doi.org/10.1037/dhe0000134

Tetnowski, J. (2015). Qualitative case study research design. *Perspectives on Fluency &*

      Fluency Disorders, *25*(1), 39–45. https://doi.org/10.1044/ffd25.1.39

Theofanidis, D., & Fountouki, A. (2018). Limitations and delimitations in the research

      process. *Perioperative Nursing*, *7*(3), 155–163.

      https://doi.org/10.5281/zenodo.2552022

Tintiangco-Cubales, A., Kohli, R., Sacramento, J., Henning, N., Agarwal-Rangnath, R.,
& Sleeter, C. (2014). Toward an ethnic studies pedagogy: Implications for K-12
schools from the research. *The Urban Review*, *47*(1), 104-
125. https://doi.org/10.1007/s11256-014-0280-y

Tong, A., & Dew, M. A. (2016). Qualitative research in transplantation: Ensuring
relevance and rigor. *Transplantation*, *100*(4), 710-712.
https://doi.org/10.1097/tp.0000000000001117.

Truscott, D., & Stenhouse, V. L. (2018). A mixed-methods study of teacher dispositions
and culturally relevant teaching. *Urban Education*.
https://doi.org/10.1177%2F0042085918801438.

Twyman, C. P. (2018). *It's not my problem: A quantitative examination of culturally
relevant word problems in fourth grade mathematics* (Publication No. 10749281)
[Doctoral dissertation, Mercer University]. ProQuest Dissertations and Theses
Global.

Underwood, J. B., & Mensah, F. M. (2018). An investigation of science teacher
educators' perceptions of culturally relevant pedagogy. *Journal of Science
Teacher Education, 29*(1), 46-64.
https://doi.org/10.1080/1046560X.2017.1423457.

Vaismoradi, M., & Snelgrove, S. (2019). Theme in qualitative content analysis and
thematic analysis. *Forum Qualitative Social Research*, *20*(3), 1-14.
http://dx.doi.org/10.17169/fqs-20.3.3376.

Valtierra, K. M., & Siegel, L. N. (2020). Qualitative self-coding as reflection: empowering teacher candidates with the tools of the researcher. *Reflective Practice*, *21*(3), 415-428.

Van Der Kleij, F., & Adie, L. (2020). Towards effective feedback: An investigation of teachers' and students' perceptions of oral feedback in classroom practice. *Assessment in Education: Principles, Policy & Practice*, *27*(3), 252-270. https://doi.org/10.1080/0969594x.2020.1748871

Warren, C. A. (2018). Empathy, teacher dispositions, and preparation for culturally responsive pedagogy. *Journal of Teacher Education, 69*(2), 169-183. https://doi.org/10.1177/0022487117712487

Whitaker, M. C., & Valtierra, K. M. (2018). The dispositions for culturally responsive pedagogy scale. *Journal for Multicultural Education, 12*(1), 10–24. https://doi-org/10.1108/JME-11-2016-0060.

Whiting, E. F., & Cutri, R. M. (2019). Teacher candidates' responses to examining personal privilege: Nuanced understandings of the discourse of individualism in critical multicultural education. *Frontiers in Education*, *4*. https://doi.org/10.3389/feduc.2019.00111

Williams, K. L., Coles, J. A., & Reynolds, P. (2020). (Re)Creating the script: A framework of agency, accountability, and resisting deficit depiction of black students in p-20 education. *Journal of Negro Education, 89*(3), 249–266.

Williams, M. T. (2018). Do no harm: Strategies for culturally relevant caring in middle level classrooms from the community experiences and life histories of black

middle level teachers. *RMLE Online: Research in Middle Level Education*, *41*(6), 1-13. https://doi.org/10.1080/19404476.2018.1460232

Wilson, A. (2015). A guide to phenomenological research. *Nursing Standard*, *29*(34), 38-43. https://doi.org/10.7748/ns.29.34.38.e8821

Wong, T. K., Tao, X., & Konishi, C. (2018). Teacher support in learning: Instrumental and appraisal support in relation to math achievement. *Issues in Educational Research*, *28*(1), 202-219.

Wu, K., & Dunning, D. (2020). Hypocognition and the invisibility of social privilege. *Advances in Group Processes*, 1-23. https://doi.org/10.1108/s0882-614520200000037001

Wullschleger, A., Garrote, A., Schnepel, S., Jaquiéry, L., & Moser Opitz, E. (2020). Effects of teacher feedback behavior on social acceptance in inclusive elementary classrooms: Exploring social referencing processes in a natural setting. *Contemporary Educational Psychology*, *60*, 1-12. https://doi.org/10.1016/j.cedpsych.2020.101841

Wynter-Hoyte, K., Braden, E. G., Rodriguez, S., & Thornton, N. (2019). Disrupting the status quo: exploring culturally relevant and sustaining pedagogies for young diverse learners. *Race Ethnicity and Education, 22*(3), 428-447. https://doi.org/10.1080/13613324.2017.1382465.

Xerri, D. (2018). Two methodological challenges for teacher-researchers: Reflexivity and trustworthiness. *Clearing House*, *91*(1), 37-41. https://doi.org/10.1080/00098655.2017.1371549.

Yin, R. K. (2015). *Qualitative research from start to finish*. Guilford publications.

Yu, E. (2018). The impact of culturally inclusive pedagogy on student achievement in a

multicultural urban school setting. *Urban Education*, *57*(1), 135-153.

https://doi.org/0042085918804013.

Zoino-Jeannetti, J., & Pearrow, M. (2020). Exploring Power: An Examination of Social

Privilege and Social Capital of Future Educators. *Educational Studies, 56*(5), 506-

518.

Appendix A.

Site Authorizations

Site Authorizations on file with Grand Canyon University.

Appendix B.

IRB Approval Letter

GRAND CANYON
UNIVERSITY

3300 West Camelback Road, Phoenix Arizona 85017   602.639.7500   Toll Free 800.800.9776   www.gcu.edu

DATE:	October 01, 2021
TO:	Tonya Strozier
FROM:	Grand Canyon University Institutional Review Board
STUDY TITLE:	Exploring Culturally Relevant Feedback to African American Students in Mathematics
IRB REFERENCE #:	IRB-2021-3993
SUBMISSION TYPE:	Submission Response for Initial Review Submission Packet
ACTION:	Determination of Exempt Status
REVIEW CATEGORY:	Category 2

Thank you for your submission of study materials.

Grand Canyon University Institutional Review Board has determined this study to be
EXEMPT FROM IRB REVIEW according to federal regulations. You now have GCU IRB
approval to collect data.

If applicable, please use the approved recruitment script and informed consent that
are included in your published documents.

We will put a copy of this correspondence on file in our office.

If you have any questions, please contact the IRB office at irb@gcu.edu or 602-639-7804.
Please include your study title and reference number in all correspondence with this office.

Appendix C.

Informed Consent

INFORMED CONSENT FORM

INTRODUCTION

The title of this research study is "Exploring Culturally Relevant Feedback to African American Students in Mathematics".

I am Tonya R. Strozier, a doctoral student under the supervision of Dr. Scott Greenberger, dissertation Chair, in the College of Doctoral Studies at Grand Canyon University. The purpose of this qualitative descriptive study is to explore how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona.

KEY INFORMATION

This document defines the terms and conditions for consent to participate in this research study.

- **How do I know if I can be in this study?**

  You are eligible for the study if you meet the following.
- Have taught math to African American students a minimum of one year.
- Teach third through fifth grade students.
- Have used culture to make learning relevant for a minimum of one year.
- Willing to answer personal information. This information may be identifiable. These questions are demographic questions. The questions are years teaching, race, educational level, training in culturally relevant pedagogy, including source and location of training.

  You are not eligible for the study if you meet the following.
- Have not taught math to African American students a minimum of one year.
- Do not teach third through fifth grade students.
- Have not used culture to make learning relevant for a minimum of one year.

- You are not willing to answer personal information. This information may be identifiable. These questions are demographic questions. Not willing to answer years teaching, race, educational level, training in culturally relevant pedagogy, including source and location of training.

- **What am I being asked to do?** If you agree to be in this study, you will be asked to:

  The activities for the study include the following.
- Choose to be a part of an individual interview or a focus group.
- Answer questions about your experiences about the topic in an interview or focus. The interview may be about 1-hour long, and the focus group may be about 1.5 hours long. There will be 6-10 other participants in the focus group.
- Attend the interview or focus group online via Zoom.
- Answer personal information. This information may be identifiable. These questions are demographic questions. The questions are years teaching, race, educational level, training in culturally relevant pedagogy, including source and location of training.
- Use a pseudonym during the interview or focus group sessions.
- Allow the researcher to record the audio of the individual interviews or focus group.
- Allow for the recordings to be transcribed by the Temi.com transcription service.
- Read your responses for accuracy and make corrections.
- Receive a $10 Target e-gift card after you have read your responses for accuracy and make corrections.
  When?
  In the month of August or September 2021.

  Audiotaping:
  I will use Zoom audio to record your responses. You cannot participate if you do not wish to be audio recorded. The recordings will be stored in a password-protected computer in my home under lock, and key and you will use a pseudonym during the interview or focus group session.
  Videotaping:
  The interview and focus group will not be video recorded. You will keep your computer camera off.

- **Who will have access to my information?** Myself, my dissertation committee, and GCU authorized persons. The transcription service, Temi.com, will only have the audio recording of the interview.

Participation is voluntary. You can leave the study at any time, even if you have not finished, without any penalty. If you decide to stop participation, you may

do so by telling me you want to stop. If so, I will use the data collected up to that point.

- **Any possible risks or discomforts?** There are no foreseeable risks or discomforts associated with the interviews. Due to the nature of a focus group, there is a risk that other participants may know your identity and what you have reported.

- **Any direct benefits for me?** No.

- **Any paid compensation for my time?** Participants will receive a $10 Target egift card for participation. Participants will receive the incentive upon completion of member checking.

- **How will my information and/or identity be protected?**

The researcher will assign pseudonyms to the data and research documents instead of names or other identifying information. The participants will use pseudonyms during the interview and focus group sessions. Hard copies of informed consent forms will be under locked and key at the researcher's home in a separate location from both the physical and the electronic coded data from the interviews and focus group.

The privacy agreement for Zoom can be viewed by clicking on the following link: https://zoom.us/privacy

The privacy agreement for Temi.com, the transcription service provider, can be found at the following link: https://www.temi.com/privacy.

Due to the nature of a focus group, the researcher cannot guarantee complete confidentiality of the data collected during this section. Should you choose to participate in the focus group it may be possible that others will know what you have reported.

PRESENTATION OF INFORMATION COLLECTED

The results will be presented to the GCU Doctoral Committee for approval and later publication. The data that will be presented will be grouped.

PRIVACY AND DATA SECURITY

- ***Will researchers ever be able to link my data/responses back to me?*** No
- ***Will my data include information that can identify me (names, addresses, etc.)?*** No

- ***Will researchers assign my data/responses a research ID code to use instead of my name?*** Yes
  - There will be research ID Codes of pseudonyms. Your real name will not be used. The informed consent forms will be kept in a separate location from the data with ID Codes.
- ***How will my data be protected (electronic and hardcopy)? Where? How long? Who will have access? Approximate destroy or de-identification date?*** Hard copies and electronic data will be stored under lock and key at the researcher's home. Electronic data will be password-protected and hard copies will be in a locked fireproof cabinet. Data will be stored for three years and then destroyed using computer software to permanently delete the files and fire. Only myself, my dissertation committee and GCU authorized persons will have access to the data.

- ***Where and how will the signed consent forms be secured?*** The signed consent forms will be stored in separate fireproof cabinet from the data. These will be stored under lock and key in the researcher's home. The consent forms will also be destroyed after three years by fire and permanently deleted from the computer.

FUTURE RESEARCH

Pseudonyms will be used for the data. Once any other possible identifiers (name, address, etc.) are removed from these data collected for this study, the de-identified data could be used for future publications without additional informed consent from you.

STUDY CONTACTS

Any questions you have concerning the research study or your participation in the study, before or after your consent, will be answered by Milinda Crawford, mcrawford1@gcu.edu and [redacted].

If you have questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the College of Doctoral Studies at IRB@gcu.edu; (602) 639-7804.

VOLUNTARY CONSENT

PARTICIPANT'S RIGHTS
- You have been given an opportunity to read and discuss the informed consent and ask questions about this study.
- You have been given enough time to consider whether or not you want to participate.
- You have read and understand the terms and conditions and agree to take part in this research study.

- You understand your participation is voluntary and that you may stop participation at any time without penalty.

Your signature means that you understand your rights listed above and agree to participate in this study.

_____

Signature of Participant or Legally Authorized Representative   Date

INVESTIGATOR'S STATEMENT

"I certify that I have explained to the above individual the nature and purpose, the potential benefits and possible risks associated with participation in this research study, have answered any questions that have been raised, and have witnessed the above signature. These elements of Informed Consent conform to the Assurance given by Grand Canyon University to the Office for Human Research Protections to protect the rights of human subjects. I have provided (offered) you a copy of this signed consent document."

(Your signature indicates that you have ensured the participant has read, understood, and has had the opportunity to ask questions regarding their participation.)

Signature of Investigator_____ Date_____

Appendix D.

Interview and Focus Group Protocol

Interview Setup and Location:

Interview Location: Via Zoom teleconference, with or without video. The Zoom interview will be recorded. Collected data will be primarily saved on an external hard drive. Collected data will be safeguard using passwords for computer and google drive files. Confidentiality and anonymity will be maintained throughout the entirety of the data. Data is kept by assigning pseudo names i.e. I1, I2 (for interviews) and FG1, FG2 for (for focus group).

A de-identified copy of the data and the data analysis will be stored on the learner's dissertation page in the folder that is placed there for that purpose, allowing access to the data for the Academic Quality Review (AQR) reviewers. Research data will be securely maintained for a period of three years after the Dean's signature. After the three-year period, data will be destroyed from primary external hard drive source.

Materials: Hard or soft copy of focus group questions for researcher, notebook for field notes to be taken by researcher during interview.

Length of interview: 45 - 60 minutes

Participants: teachers that use culturally relevant pedagogy.

Introduction: Good morning/afternoon/evening. I am Tonya Strozier, and I am a doctoral candidate at Grand Canyon University. Thank you for considering in being a part of this research study. Participation in this study is voluntary and you may discontinue at any point if you so choose.

Purpose: The purpose of this study is to explore the how teachers use culture and feedback to help Black or African American students learn math.

Study's Title: Exploring Culturally Relevant Feedback to Black or African American Students in Mathematics

Consent Forms: Please review the consent forms. Do you have any questions before we begin? Read and sign them using DocuSign if you agree with the content. After you submit through DocuSign and I confirm the forms are received, I will begin recording this interview session. Do you have any questions? Do I have your permission to record? Begin recording.

Recording Instructions: With your consent, I would like to record our conversation. This will enable me to accurately transcribe your statements and capture your sentiments regarding the subject matter. Please rest assured that your responses will be kept confidential. Researchers associated with this study were only people who can access this recording. Recordings will be securely stored for a period of three years and then destroyed at the conclusion of this research. I will ask you in a moment if I have your permission to record.

Interview questions: This will interview will include demographic, primary and probing questions to answer the research questions. Please complete the anonymous demographic questionnaire using the link provided in the chat.

Conclusion of interview: Do you want to share any additional insights? I will now stop recording. Thank you for your participation in the study. The next step of the study will be to prepare the transcripts of our interview. Once you have reviewed the transcripts for corrections and returned them, I will email the Target gift card for $10. I

will be sure to share the results of the study with you when it is approved and completed.

That concludes our interview. Thank you.

Research Question	Questions	Notes
RQ1: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students?	**Culturally relevant pedagogy is considered to be when a teacher makes learning relevant to culturally diverse students. How would you describe your first experience with making learning relevant to culturally diverse students?** Follow up questions • How does understanding of culturally relevant pedagogy or making learning relevant to culturally diverse students inform your classroom practices? • How would you describe what you have done since your initial learning to further develop your culturally relevant pedagogy or the ability to make learning relevant to culturally diverse students? **How have trainings or professional development provided by your school or district helped you in the development of making learning relevant to culturally diverse students?** Follow up question • How would you describe your key takeaways from those trainings or school provided professional development? **How did your teacher preparation or alternate route to certification experience help you develop the ability to make learning relevant to culturally diverse students?**	Aligned with the teacher's development of culturally relevant pedagogy.

	Follow up question:	
	• How were you able to apply that new information to your classroom practices? **In what ways do you improve upon making learning relevant to culturally diverse students in the classroom?** Follow up question • How has your cultural competence or knowledge of and positive attitudes towards the cultures of your students developed or evolved over time? • How has your sociopolitical/critical consciousness or ability to see and examine inequality and take action developed over time? • How has your academic success developed or improved over time? • How are social power structures integrated into your instruction?	
RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to Black or African American third through fifth grade elementary	**What factors do you consider when you are providing feedback to Black or African American students?** Follow up questions • How would you describe the way you use your Black or African American student's culture to provide feedback during math instruction? • What role does your culture play in providing feedback to Black or African American students? • How would you describe the way you provide corrective or	Aligned with the use of culturally relevant pedagogy to provide feedback to Black or African American students. Specifically, the teacher's knowledge and use of Black or African American culture.

students during math instruction?	disciplinary feedback to Black or African American students? • From your experience, when is the most effective time to provide feedback to Black or African American students?	
Research Question? RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to Black or African American third through fifth grade elementary students during math instruction?	**How do you use cultural competence** or knowledge of and positive attitudes towards the cultures of your students **when providing feedback to Black or African American students?** Follow up question • How do you incorporate Black or African American culture in your feedback?	Aligns with the use of the **cultural competence** tenet of the culturally relevant pedagogy theory.
RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to Black or African American third through fifth grade	**How do you help students** see and examine inequality and take action **through your feedback?** Follow up question: • How do you include students' lived experiences (student assets) into the taught curriculum? • How do you encourage Black or African American students to apply their lived experiences to what they are learning in mathematics?	Aligns with the use of the **sociopolitical/critical consciousness** tenet of the culturally relevant pedagogy theory by addressing the teacher's use of their sociopolitical/critical consciousness to provide feedback to students.

elementary students during math instruction?		
RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to Black or African American third through fifth grade elementary students during math instruction?	**How would describe your beliefs when it comes to facilitating academic success for Black or African American students in math?** Follow up question: • How do those beliefs show up in the feedback you provide? **How do you know when Black or African American students have misconceptions or misunderstandings in math?** Follow up questions: • How do you encourage Black or African American students to share their thinking around math with you? • How do you build on that information or respond to provide feedback? • How would you describe your questioning style when providing feedback to Black or African American students?	Aligns with the use of the **academic success** tenet of the culturally relevant pedagogy theory by addressing the teacher's disposition and noticing in providing feedback.

Focus Group Protocol

Focus group setup and location:

Interview Location: Via Zoom teleconference, with or without video. The Zoom interview will be recorded. Collected data will be primarily saved on an external hard drive. Collected data will be safeguard using passwords for computer and google drive files. Confidentiality and anonymity will be maintained throughout the entirety of the data. Data is kept by assigning pseudo names i.e. I1, I2 (for interviews) and FG1, FG2 for (for focus group).

A de-identified copy of the data and the data analysis will be stored on the learner's dissertation page in the folder that is placed there for that purpose, allowing access to the data for the Academic Quality Review (AQR) reviewers. Research data will be securely maintained for a period of three years after the Dean's signature. After the three-year period, data will be destroyed from primary external hard drive source.

Materials: Hard or soft copy of focus group questions for researcher, notebook for field notes to be taken by researcher during focus group.

Length of focus group: 60 -90 minutes

Participants: teachers that use culturally relevant pedagogy.

Introduction: Good morning/afternoon/evening. I am Tonya Strozier, and I am a doctoral candidate at Grand Canyon University. Thank you for considering being a part of this research study. Participation in this study is voluntary and you may discontinue at any point if you so choose.

Purpose: The purpose of this study is to explore the how teachers use culture and feedback to help Black or African American students learn math.

Study's Title: Exploring Culturally Relevant Feedback to Black or African American Students in Mathematics

Consent Forms: Please review the consent forms. Do you have any questions before we begin? Read and sign them using DocuSign if you agree with the content. After you submit through DocuSign and I confirm the forms are received, I will begin recording this interview session. Do you have any questions? Do I have your permission to record? Begin recording.

Focus group questions: This will focus group will, include demographic, primary and probing questions to answer the research questions. Please complete the anonymous demographic questionnaire using the link provided in the chat.

Recording Instructions: With your consent, I would like to tape record our conversation. This will enable me to accurately transcribe your statements and capture your sentiments regarding the subject matter. Please rest assured that your responses will be kept confidential. Researchers associated with this study was only people who can access this recording. Recordings will be securely stored for a period of three years and then destroyed at the conclusion of this research. I will ask you in a moment if I have your permission to record.

Conclusion of interview: Do you want to share any additional insights? I will now stop recording. Thank you for your participation in the study. The next step of the study will be to prepare the transcripts of our interview. Once you have reviewed the transcripts for corrections and returned them, I will email the Target gift card for $10. I will be sure to share the results of the study with you when it is approved and completed. That concludes our interview. Thank you.

Research question	Questions	Notes
RQ1: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students?	**Culturally relevant pedagogy is considered to be when a teacher makes learning relevant to culturally diverse students. How would describe your motivation for developing your culturally relevant pedagogy?** Follow up question • How does your reasoning compare or contrast with what was shared? **How would you describe the different ways you have developed your culturally relevant pedagogy** or the ability to make learning relevant to culturally diverse students**?** Follow up question • How would describe the support you received to develop your culturally relevant pedagogy or the ability to make learning relevant to culturally diverse students? **How would you describe your experience of developing your culturally relevant pedagogy** or the ability to make learning relevant to culturally diverse students**?** Follow up questions • How would you describe the challenges you experienced when developing their culturally relevant pedagogy or the ability to make learning relevant to culturally diverse students?	Aligned with development of culturally relevant pedagogy.

	• How would you describe the successes you experienced while developing your culturally relevant pedagogy or the ability to make learning relevant to culturally diverse students?	
RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to Black or African American third through fifth grade elementary students during math instruction?	**Cultural competence component** **You are asking questions to students during a class lesson on fractions and notice the Black or African American students are not providing correct answers. How would you handle this situation?** Follow up questions • How would describe the way you use what you know about Black or African American student's culture to provide feedback during math instruction? • In providing feedback to Black or African American students, what role does your culture play? • How do you use cultural competence or knowledge of and positive attitudes towards the cultures of your students to build rapport with Black or African American students when providing feedback?	Aligns with the use of the **cultural competence** tenet of the culturally relevant pedagogy theory. Specifically, respect and rapport as supported in literature.
RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to Black or African	**Sociopolitical/critical consciousness component** **One's sociopolitical/critical consciousness is considered to be the ability to see and examine inequality and take action**. **How do you incorporate current sociopolitical/critical consciousness into feedback?**	Aligns with the use of the **sociopolitical/critical consciousness** tenet of the culturally relevant pedagogy theory by addressing the teacher's use of their sociopolitical/critical consciousness to

American third through fifth grade elementary students during math instruction?	Follow up questions: - As a culturally relevant teachers how do you make sociopolitical/critical consciousness or the ability to see and examine inequality and take action meaningful to Black or African American students? - How does your experience with helping students or the ability to see and examine inequality and take action compare or contrast with what was shared?	provide feedback to students.
RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to Black or African American third through fifth grade elementary students during math instruction?	**Academic success component** **Teacher disposition is comprised of the beliefs and values that influence behaviors toward students and facilitate learning. As a culturally relevant teacher, how would you describe your disposition?** Follow up questions: - How do you use your disposition or beliefs and values that influence behaviors toward students and facilitate learning in providing feedback to Black or African American students during math? - As a culturally relevant teacher, how would you describe your values in relation Black or African American students? - As a culturally relevant teacher, how would you describe your beliefs about Black or African American students?	Aligns with the use of the **academic success** tenet of the culturally relevant pedagogy theory.

	How do you provide feedback when **Black or African American students have misconceptions or misunderstandings in math?** Follow up questions: • How do you encourage Black or African American students to share their thinking around math with you?	

Demographic Questions

How many years have you been teaching?

What race or ethnicity do you identify with?

What is your highest educational level?

What is the source of your culturally relevant pedagogy training?

How many hours of training have you received in Culturally Relevant Pedagogy?

What county and state do you reside in?

Appendix E.

Codebook

Code	Code Description	Code Count
Category: CRP Component Dev Strategies		
Academic Success	CRP teachers describe the development of their Academic success.	9
Critical Consciousness	Participants describe strategies employed to develop their critical consciousness.	16
Cultural Competence Dev	Participants describe strategies used to develop their cultural competence through dialogue and relational interactions.	20
Category: Teacher Praxis from CRP Dev		
Disposition: Values	Teachers describe their values	13
Disposition: Belief	Teachers describe their beliefs	5
Disposition: Behavior	Participants describe the values, attitudes, and patterns of behaviors developed from CRP.	27
knowledge of self	Participants describe the necessity of knowing themselves	2
Knowledge of students	Participants describe the necessity of knowing themselves and a deep knowledge of their students to appropriate relate to students.	6
Curriculum Practices	Participants describe curriculum approaches and practices from developing their culturally relevant pedagogy.	11
Category: Self-Initiated CRP Development		

Teacher motivation for dev CRP	Participants describe their motivation for developing their CRP	6
Dev Facilitated by Personal exp	Participants describe CRP development that was facilitated by a personal experience.	24
Teacher seeking to learn from others	Participants describe how they sought to develop their CRP by collaborating and dialoguing with colleagues and learning from students.	15
Teacher internal growth	Participants describe their ability to grow on a personal or internal level in respect to culturally relevant pedagogy.	10
Dev from self-paid/personal pursuit of trainings	Participants describe using their personal funds to pay for and attend professional development and trainings to develop their CRP.	5
Self-directed reading and research for CRP Dev	Participants describe developing CRP through self-initiated reading and research.	11
Category: Teacher Prep to Support CRP Dev		
Teacher prep support to dev CRP	Participants describe minimal support from teacher preparation and pre-service to develop their culturally relevant pedagogy.	6
Teacher prep did not support dev of CRP	Participants describe teacher preparation program as unsupportive in the development of their culturally relevant pedagogy.	10
Category: School/district PD/trainings to support CRP Dev		
School/district PD/trainings do not support CRP Dev	Participants describe how school or district professional development and trainings do not support the development of their culturally relevant pedagogy.	11
School/district support dev of CRP	Participants describe how district and school professional developments and trainings provide support in the	11

	development of their culturally relevant pedagogy.	
Category: Timing and setting of CRF		
Timing of feedback	CRP teachers describe the most effective time to provide feedback to African American students is immediate, either one-on-one or in a small group	17
Setting of FB	CRP teachers describe the most effective time to provide feedback to African American students is either one-on-one or in a small group	5
Category: Teacher noticing		
Notice thru assessments	CRP teachers describe how they recognize through assessments when an African American student has misconceptions or misunderstandings in mathematics to provide feedback.	22
Notice new behavior	CRP teachers describe how they recognize new behavior when an African American students have misconceptions or misunderstandings in mathematics to provide feedback.	6
Category: Considerations for feedback		
consider feedback reaction	CRP teachers describe their considerations of student reaction when providing feedback to African American students.	3
consider feedback words	CRP teachers describe their considerations of their word choice when providing feedback to African American students.	4
consider feedback tone	CRP teachers describe their considerations of their tone when providing feedback to African American students.	3
consider std family	CRP teachers describe their considerations of the student's family when providing feedback to African American students.	4

consider ed experience	CRP teachers describe their considerations of the student's educational experience when providing feedback to African American students.	4
consider student	CRP teachers describe their considerations of the individual student when providing feedback to African American students.	8
Category: Teacher culture		
power dynamics	CRP teachers describe the impact of power dynamics they see in providing feedback to AA students	9
values	CRP teachers describe the impact of their values in providing feedback to AA students	11
Lived experiences	CRP teachers describe the impact of their lived experiences in providing feedback to AA students	8
Category: Teacher beliefs and practices		
Teacher Practices	CRP teachers describe their beliefs when it comes to facilitating academic success for Black or African American students in math.	13
Asset Beliefs	CRP teachers describe their beliefs when it comes to facilitating academic success for Black or African American students in math.	12
Believe All successful	CRP teachers describe their belief that all students can be successful	16
Believe teacher responsible	CRP teachers describe their believes teacher is responsible when it comes to facilitating academic success for Black or African American students in math.	12
Teacher creates atmosphere	CRP teachers describe their belief that teachers create class atmosphere	10
Category: Community built		

within the classroom		
Community Reflective teacher	CRP teachers describe being reflective to build the classroom community	6
Relatable Community	CRP teachers describe making sure class content is relatable to the students to build the classroom community	12
Openness in Community	CRP teachers describe using openness for building the classroom community	7
Safety in community	CRP teachers describe creating a sense of safety in the classroom community	23
Comfort in Community	CRP teachers describe a sense of comfort in the classroom community	7
Power/voice in the community	CRP teachers describe students using their voice/power in the classroom community	18
Supportive classroom community	CRP teachers describe using creating a supportive classroom community	37
Category: Use AA culture by connecting to family		
Conversations with AA Family	CRP teachers describe using conversations to learn AA culture to provide feedback to AA students	13
AA Family dynamics	CRP teachers describe learning family dynamics to learn AA culture to provide feedback to AA students	9
AA Family values	CRP teachers describe learning and using family values to provide feedback to AA students	7
AA Stories	CRP teachers describe using family stories learn AA culture and to provide feedback to AA students	6
To use AA culture is to know the student well	CRP teachers describe how using AA culture is to know the student well.	4

Category: Black to Black Racial Congruency		
Black Code Switching	Black CRP teachers describe code switching to provide feedback	17
Black Sense of responsibility	Black CRP teachers describe having a sense of responsibility when providing feedback to AA students	8
Black Role Model	Black CRP teachers describe being a role model to AA students	9
Black shared experience	Black CRP teachers describe a shared experience of being black in education setting	8
Category: Use of AA culture		
Use Call and response	CRP teachers described using call and response manifestation of African American culture	17
Use Movement	CRP teachers described using movement as a manifestation of African American culture	14
Use Storytelling	CRP teachers described using storytelling manifestation of African American culture	8
Category: Communicate Caring and Respectful Feedback		
Respectful Feedback	CRP teachers describe giving corrective/disciplinary feedback by demonstrating respect for the AA student	9
Communicate Care	CRP teachers describe giving corrective/disciplinary feedback by demonstrating care for the AA student	15
Methods of Corrective Feedback		
Tailored feedback	CRP teachers describe tailoring their approach to corrective/disciplinary feedback based on the AA students' individual needs	5

Feedback conversation	CRP teachers describe how corrective/disciplinary feedback is delivered through private conversation with AA student	12

Code	Code Description	Code Count
Category: CRP Component Dev Strategies		
Academic Success	CRP teachers describe the development of their Academic success.	9
Critical Consciousness	Participants describe strategies employed to develop their critical consciousness.	16
Cultural Competence Dev	Participants describe strategies used to develop their cultural competence through dialogue and relational interactions.	20
Category: Teacher Praxis from CRP Dev		
Disposition: Values	Teachers describe their values	13
Disposition: Belief	Teachers describe their beliefs	5
Disposition: Behavior	Participants describe the values, attitudes, and patterns of behaviors developed from CRP.	27
knowledge of self	Participants describe the necessity of knowing themselves	2
Knowledge of students	Participants describe the necessity of knowing themselves and a deep knowledge of their students to appropriate relate to students.	6
Curriculum Practices	Participants describe curriculum approaches and practices from developing their culturally relevant pedagogy.	11
Category: Self-Initiated CRP Development		
Teacher motivation for dev CRP	Participants describe their motivation for developing their CRP	6
Dev Facilitated by Personal exp	Participants describe CRP development that was facilitated by a personal experience.	24

Code	Code Description	Code Count
Teacher seeking to learn from others	Participants describe how they sought to develop their CRP by collaborating and dialoguing with colleagues and learning from students.	15
Teacher internal growth	Participants describe their ability to grow on a personal or internal level in respect to culturally relevant pedagogy.	10
Dev from self-paid/personal pursuit of trainings	Participants describe using their personal funds to pay for and attend professional development and trainings to develop their CRP.	5
Self-directed reading and research for CRP Dev	Participants describe developing CRP through self-initiated reading and research.	11
Category: Teacher Prep to Support CRP Dev		
Teacher prep support to dev CRP	Participants describe minimal support from teacher preparation and pre-service to develop their culturally relevant pedagogy.	6
Teacher prep did not support dev of CRP	Participants describe teacher preparation program as unsupportive in the development of their culturally relevant pedagogy.	10
Category: School/district PD/trainings to support CRP Dev		
School/district PD/trainings do not support CRP Dev	Participants describe how school or district professional development and trainings do not support the development of their culturally relevant pedagogy.	11
School/district support dev of CRP	Participants describe how district and school professional developments and trainings provide support in the development of their culturally relevant pedagogy.	11
Category: Timing and setting of CRF		
Timing of feedback	CRP teachers describe the most effective time to provide feedback to African American students is immediate, either one-on-one or in a small group	17
Setting of FB	CRP teachers describe the most effective time to provide feedback to African American students is either one-on-one or in a small group	5

Code	Code Description	Code Count
Category: Teacher noticing		
Notice thru assessments	CRP teachers describe how they recognize through assessments when an African American student has misconceptions or misunderstandings in mathematics to provide feedback.	22
Notice new behavior	CRP teachers describe how they recognize new behavior when an African American students have misconceptions or misunderstandings in mathematics to provide feedback.	6
Category: Considerations for feedback		
consider feedback reaction	CRP teachers describe their considerations of student reaction when providing feedback to African American students.	3
consider feedback words	CRP teachers describe their considerations of their word choice when providing feedback to African American students.	4
consider feedback tone	CRP teachers describe their considerations of their tone when providing feedback to African American students.	3
consider std family	CRP teachers describe their considerations of the student's family when providing feedback to African American students.	4
consider ed experience	CRP teachers describe their considerations of the student's educational experience when providing feedback to African American students.	4
consider student	CRP teachers describe their considerations of the individual student when providing feedback to African American students.	8
Category: Teacher culture		
power dynamics	CRP teachers describe the impact of power dynamics they see in providing feedback to AA students	9
values	CRP teachers describe the impact of their values in providing feedback to AA students	11

Code	Code Description	Code Count
Lived experiences	CRP teachers describe the impact of their lived experiences in providing feedback to AA students	8
Category: Teacher beliefs and practices		
Teacher Practices	CRP teachers describe their beliefs when it comes to facilitating academic success for Black or African American students in math.	13
Asset Beliefs	CRP teachers describe their beliefs when it comes to facilitating academic success for Black or African American students in math.	12
Believe All successful	CRP teachers describe their belief that all students can be successful	16
Believe teacher responsible	CRP teachers describe their believes teacher is responsible when it comes to facilitating academic success for Black or African American students in math.	12
Teacher creates atmosphere	CRP teachers describe their belief that teachers create class atmosphere	10
Category: Community built within the classroom		
Community Reflective teacher	CRP teachers describe being reflective to build the classroom community	6
Relatable Community	CRP teachers describe making sure class content is relatable to the students to build the classroom community	12
Openness in Community	CRP teachers describe using openness for building the classroom community	7
Safety in community	CRP teachers describe creating a sense of safety in the classroom community	23
Comfort in Community	CRP teachers describe a sense of comfort in the classroom community	7
Power/voice in the community	CRP teachers describe students using their voice/power in the classroom community	18
Supportive classroom community	CRP teachers describe using creating a supportive classroom community	37

Code	Code Description	Code Count
Category: Use AA culture by connecting to family		
Conversations with AA Family	CRP teachers describe using conversations to learn AA culture to provide feedback to AA students	13
AA Family dynamics	CRP teachers describe learning family dynamics to learn AA culture to provide feedback to AA students	9
AA Family values	CRP teachers describe learning and using family values to provide feedback to AA students	7
AA Stories	CRP teachers describe using family stories learn AA culture and to provide feedback to AA students	6
To use AA culture is to know the student well	CRP teachers describe how using AA culture is to know the student well.	4
Category: Black to Black Racial Congruency		
Black Code Switching	Black CRP teachers describe code switching to provide feedback	17
Black Sense of responsibility	Black CRP teachers describe having a sense of responsibility when providing feedback to AA students	8
Black Role Model	Black CRP teachers describe being a role model to AA students	9
Black shared experience	Black CRP teachers describe a shared experience of being black in education setting	8
Category: Use of AA culture		
Use Call and response	CRP teachers described using call and response manifestation of African American culture	17
Use Movement	CRP teachers described using movement as a manifestation of African American culture	14
Use Storytelling	CRP teachers described using storytelling manifestation of African American culture	8
Category: Communicate Caring and Respectful Feedback		

Code	Code Description	Code Count
Respectful Feedback	CRP teachers describe giving corrective/disciplinary feedback by demonstrating respect for the AA student	9
Communicate Care	CRP teachers describe giving corrective/disciplinary feedback by demonstrating care for the AA student	15
Methods of Corrective Feedback		
Tailored feedback	CRP teachers describe tailoring their approach to corrective/disciplinary feedback based on the AA students' individual needs	5
Feedback conversation	CRP teachers describe how corrective/disciplinary feedback is delivered through private conversation with AA student	12

Appendix F.

Transcripts

Excerpt of Coded Interview with Antoinette:

⚙	48	Okay. And so, as a teacher, you know, having, you're having this awareness or knowing about different cultures how have you worked on that or develop that over time? Just your ability to know about different cultures, the cultures of your students. Have you worked on that?
	49	Antoinette:
..Cult Competenc	50	I think for me, it's just, again, having those discussions with them, but also just taking the time and getting to know these different cultures and that in itself, you know, can be tricky because, you know, it's like, I want to be able to do things the right way and not, I'm not going to be like, oh, well, this kid over here, you know, you know celebrates Kwanzaa. So I'm going to talk to this kid about it, you know, and have him talk to the class or anything. Like, I want to be aware so that I'm just teaching the students and then if they have anything they want to say to, you know, discuss those things. So I would say over time, I've learned a little bit more. I even, I would say even like my first year of teaching, I feel like I was actually kind of dumb when it came to being like, you know, aware of stuff. Cause I was still kind of going through the motions of, okay, well, here's what I know how to do this. I've kind of had to step out of my comfort zone a little bit, like with different books and with taking time on different things so that, you know, I can give them that cultural difference than I used to.
..CRP Teacher Dis	51	Researcher:
	52	Yeah. So, you know, knowing that like socio that there's this term it's called critical consciousness, which is like this ability to see and examine any qualities that different social groups and communities experience, you know, like I know it I'm aware. And then I take action, like as a teacher. How has your ability to do that changed over time? How has your critical consciousness been developed or changed over time?
	53	Antoinette:
..Strategies to De'	54	I would say over time, it has, I don't even know if I want to say it's gotten significantly better, but it has gotten a little better. I mean, it sort of goes in with some of those PDs we would have about being aware of like a child's background and being able to, you know, teach them a certain way or whatever. But for me, I I've never really wanted to like single any of my kids out because their behavior or anything like that, I will say that I've with certain kids coming into my class that either this is the first time they've been, you know, dealt with behavior wise seriously, or they have not been for full I had an African-American boy in my class who, you know, his mom was talking to me one day and she was just like, you're his favorite teacher?
	55	Antoinette:
..CRP Teacher Dis	56	You know, he hasn't gotten in trouble or anything like that. And I'm like, he's got, he hasn't gotten in trouble. What does that mean? And she's like, well, last year he got in a lot of trouble with the teachers he had the previous year. And I'm thinking why, because he's not really a bad kid at all. He likes to talk a little bit, but I had way worse kids that were in the same classes that, you know, I had to deal with. And so for me, I don't want to be treating a kid a certain way because of, you know their background or how they look or anything like that. I kind of want to just sort of have a unified class and, you know, there's differences. Everybody looks different and is different. I want to embrace that too, but I also don't want to be like, oh, this kid has a pattern of being bad.

Excerpt of Coded Focus Group:

	2	Okay. So I want to welcome everyone to this research focus group. My name is Tonya Strozier. I'm a doctoral candidate at grand canyon university. And so we're going to go ahead and get started. Let' talk first. Here's our first question. And really, again, this is just a conversation. So culturally relevant pedagogy is considered to be when a teacher makes learning relevant to culturally diverse students How would you describe your motivation for developing that skill of being culturally relevant? And anyone can chime in and start and just kick us off?
	3	Marie:
..Teacher motivati / ..Knowledge of se / ..Curriculum Prac	4	Well, I'll start. I, I, for me, the motivation is always the students and my ability to connect with them And it's not enough to connect just academically or just personally, but getting to know who they a and then knowing that everything they bring, whether it's their culture, whether it's their hobbies with whether it's, how they relate to their own families or the other people around them isn't is important to their ability to connect academically. And I know as a kid myself I did not feel I was, I was good academically, but I did not feel connected to the academics. It was something outside of me. And so I think when we talk about culturally relevant, it has to mean something to the kids and they have to be able to see themselves in what they're doing, rather than it just be something that's pushed on them from the outside.
	5	Researcher:
	6	Anyone else want to chime in or compare or anything similar or different from what has already bee shared by Marine?
	7	Dana:
..Teacher motiva ..Black to Black ..Teacher motiva	8	So Dana Danna wants to chime in. So my motivation is really the survival of black people or black boys. You know, it's just I literally want to save lives, you know, I mean, it seems like a big thing, but, or, you know, like grandiose or whatever, but black folks are in real trouble in this country. An you know, I just feel a responsibility to help particularly black boys kind of survive the system and indeed figure out how to, I don't know if we want to thrive in it or throw it over or what, but you ha to be able to, you read, you know, you just have to be able to read. And, and that's really kind of what, what, why I thought I would become a teacher because I was seeing, I was working with sixth graders, well at a middle school and I could just see how many, they just couldn't handle sixth grac material. And it's like, you know, what's going to happen to these guys. And so that's kind of like me, I just said, I just need to help people read because you can, you know, you're not defenseless completely if you can read any additional thoughts.
	9	Solomon:
..Teacher motivati	10	Yeah, definitely. Thank you, Dana, for sharing that, Dan, I'm sorry. Thank you, Donna, for sharing that. Yeah, I mean, I think I guess as a white person, I, I came to and come to teaching as like justic work, social justice work. And I think like as a, as a kid I, I definitely loved information. I loved learning, but I think I and you know, that's part of how I came to this work too, but yeah, I came to teaching work fueling the, the responsibility that I have as a white person in this country and in this world to, you know, fight against white supremacy and to, to work, to, to undo it and its, and its workings in, in the systems that we work in and live in.

Appendix G.

Feasibility and Benefits Checklist

Gatekeepers: Who are the possible gatekeepers? (i.e., If you are in a school district, have you checked with the principal and the superintendent's office or their designee to see what the process is for research? Or, if you are at a company, talked with the management, etc.? If you are planning on collecting data from a college, what is the process? It is preferred that you obtain Institutional Review Board (IRB) approval from that institution prior to applying for GCU's IRB approval).	[redacted] Facebook Groups
Gatekeeper Contact: Who do you need to keep in contact with as you form your research project to ensure that the benefits outweigh the risk, and you can conduct your research? How will you initiate and maintain contact with them?	[redacted] – [redacted] Facebook Group. Contact via Messenger or post. [redacted] – Administrators for [redacted] Facebook Group. Contact via Messenger or post.
Outside IRB: If you are planning on recruiting participants or getting data from a college (or other institutions with an IRB), have you talked to their IRB determine the process and what participants/data they will allow you access? Please note, IRB approval typically takes some time.	N/A
Study Benefits: What is the benefit of your research? Who do you need to keep in contact with as you form your research project to ensure that the benefits outweigh the risks? *Remember that research should have a benefit; what benefit does your research have to others beside yourself?*	Culturally relevant teachers will provide a description of how culturally relevant feedback is provided to African American students to improve math achievement.
Research Activity: Is your research part of *normal everyday activities*? This is significant because this must be outlined in your site authorization. A preliminary site authorization letter could simply be an email from a school/college/organization that indicates they understand what you want to do and how that benefits the school/college/organization. In some cases this will determine the classification of the study (this is especially important for educational research studies). ***Please see below for information regarding preliminary site authorization	The research is part of normal everyday activity for teachers.

Recruitment: Please describe your recruitment strategy. How do you plan to involve your participants in the process? What would your flyer/email say?	Researcher will contact Facebook group administrators to post research flyer. The flyer will contain a description the study, benefits, information about informed consent, criteria to participate, researcher's contact information, and Calendly link to schedule interview/focus group.
Data Collection What are you asking of participants? Are you asking them personal information (like demographic information such as age, income, relationship status)? Is that personal information necessary? How much time are you asking of participants (for example, if you are asking them to be interviewed, be in a focus group, fill out a questionnaire, fill out a journal/survey, collect artifacts, etc.)? How much time will they have to spend to be in your study? Does each part of your data collection help answer your research question? Participants <u>must be told how long it will take to participants to participate in each activity</u>. Are you concerned that the activities would take too long, and participants might not finish/drop out? Can you collect your data in a reasonable amount of time considering the stakeholders and possible challenges of gaining access to participants?	Participants will be asked to participate in an interview or focus group. The interview will last 30-60 minutes. The focus group will last 1-1 ½ hours. Data collection will take place via Zoom or Facetime. The interview and focus group questions, research questions, and theory are in alignment.
Child Assent. Studies with children often fall under the regulations for a full board review (full board reviews take significantly longer in IRB). Each child must fill out a child assent AFTER there is parental consent. (It can be very difficult to get parental consent, especially if this is something sent home to parents).	N/A
Informed Consent Participants <u>must be told how long it will take to participants to participate in each activity</u>. Are you concerned that the activities would take too long, and participants might not finish/drop out?	The interview times are reasonable, and the participants will be informed ahead of time.
Site Authorization Do you have a site authorization letter? How difficult will this be to get from the school/ school district/college/organization? Use the GCU template to ensure the correct information is included.	Site authorization from the Facebook groups will be pursued in March 2021.
Can you collect your data in a reasonable amount of time considering the stakeholders and possible challenges of gaining access to participants?	Yes
Organizational Benefits: Have you talked to your principal/supervisor/district/college/boss/ organization about your research? If so, have you	My supervisor is aware of my research.

asked them what you can do to help the district/organization/school?	
What is the overall benefit of your research to participants?	Contribute to knowledge about how to helps improve math achievement for African American students.
What are the risks of your research? Please note that there are usually some risks (like revealing participant identity) in all research.	There is a risk of revealing participant identity, but pseudonyms will be used.
Now that you have contemplated the above questions, how long do you imagine it will take you prior to access your participants/data? AND how much are you asking of your participants?	One hour for interviews and 90 minutes for the focus group.
Based on the information that you have learned, is your study feasible? Why or why not? If not, how can you modify your ideas to make your study manageable?	The study is feasible.

Appendix H.

Recruitment Materials

Copy of the Invitation to Participate (Study Advertisement)

Grand Canyon University
College of Doctoral Studies
3300 W. Camelback Road
Phoenix, AZ 85017
Phone: 602-639-7804
Email: irb@gcu.edu

RECRUITMENT

Date: September 1, 2021

I am a doctoral learner lead by Dr. Greenberger in the College of Doctoral Studies at Grand Canyon University. My name is Tonya R. Strozier. I am doing research on how teachers learn how to make learning relevant to culturally diverse students. I will look closely at how feedback is given to African American students during math instruction in Arizona.

I am recruiting individuals that meet these criteria:

- Have taught math to African American students a minimum of one year.
- Teach third through fifth grade students.
- Have used culture to make learning relevant for a minimum of one year.
- Willing to answer personal information. This information may be identifiable. These questions are demographic questions. The questions are years teaching, race, educational level, training in culturally relevant pedagogy, including source and location of training.

You cannot be in this study if:

- Have not taught math to African American students a minimum of one year.
- Do not teach third through fifth grade students.
- Have not used culture to make learning relevant for a minimum of one year.
- You are not willing to answer personal information. This information may be identifiable. These questions are demographic questions. Not willing to answer years teaching, race, educational level, training in culturally relevant pedagogy, including source and location of training.

The activities for the study include the following.

Choose to be a part of an individual interview or a focus group. Answer questions about your experiences about the topic in an interview or focus. The interview may be about 1-hour long, and the focus group may be about 1.5 hours long. There will be 6-10 other participants in the focus group. Attend the interview or focus group online via Zoom. Answer personal information. This information may be identifiable. These questions are demographic questions. The questions are years teaching, race, educational level, training in culturally relevant pedagogy, including source and location of training (10 minutes).

Participants can skip questions in the study

Your participation in this study is voluntary.

All data in this study will be protected by not asking personal information such as first and last name, employer, or address. If this information is shared, it will be left out during transcription by the researcher. All participant information will be kept confidential. The researcher will lock any and all personal information into a password-secured folder on a password-secured computer. The computer will be kept in a password

protected safe within a locked room. The information will be kept for 3 years after the

study is completed. The information will be permanently deleted from the hard drive of

the computer.

 If you are interested in participating in this study, please contact me at

tstrozier@my.gcu.edu and [redacted].

 Thank you!

Purpose I am doing research on how teachers learn how to make learning relevant to culturally diverse students. I will look closely at how feedback is given to African American students during math instruction in Arizona.

Research Participants Needed

Are you a 3rd-5th grade Math teacher?

You can be in this study if you: Have taught math to African American students a minimum of one year. Teach third through fifth grade students. Have used culture to make learning relevant for a minimum of one year. Willing to answer personal information. This information may be identifiable. These questions are demographic questions. The questions are years teaching, race, educational level, training in culturally relevant pedagogy, including source and location of training.

To Thank you for your participation, a $10 Target gift card will be emailed after documents are returned.

Tonya R. Strozier
Doctoral Student
Grand Canyon University

Research Activities

Choose to be a part of an individual interview or a focus group. Answer questions about your experiences about the topic in an interview or focus. The interview may be about 1-hour long, and the focus group may be about 1.5 hours long. Answer personal information. This information may be identifiable. These questions are demographic questions. The questions are years teaching, race, educational level, training in culturally relevant pedagogy, including source and location of training.

If you or someone you know are interested in participating in this study, please contact Tonya Strozier at tstrozier@my.gcu.edu or ▮▮▮▮▮▮

Appendix I.

Ten Strategic Points

Ten Strategic Points	
The ten strategic points emerge from researching literature on a topic, which is based on, or aligned with a defined need or problem space within the literature as well as the learner's personal passion, future career purpose, and degree area. The Ten Strategic Points document includes the following key points that define the research focus and approach:	
Strategic Points Descriptor	**Learner Strategic Points for study**
1. **Dissertation Topic**- Provides a broad research topic area/title.	How teachers that use culturally relevant pedagogy describe the influence of culturally relevant feedback on African American student's math achievement
2. **Literature Review** - Lists primary points for four sections in the Literature Review: (a) Background of the problem and the need for the study based on citations from the literature; (b) Theoretical foundations (Theories, models, and concepts) and if appropriate the conceptual framework to provide the foundation for study); (c) Review of literature topics with key themes for each one; (d) Summary.	Background to the problem There is a need to explore how teachers develop their culturally relevant pedagogy to provide feedback, as well as how those strategies are used to provide feedback to African American math students. Specifically, Skovholt (2018) suggested that further study is needed to better understand how teachers deliver verbal feedback, and Schuldt (2019) called for the examination of factors that influence feedback. Additionally, researchers have indicated the need to explore the math teacher's perspectives on providing feedback to African American students (Hill, 2018; Savage et al., 2018). Also, scholars have called for further examination of culturally relevant practices in the classroom as potential strategies to mitigate the lingering achievement gap in many subjects, including

		mathematics (Allen, 2008; Martell & Stevens, 2019; Ortiz et al., 2018).
		Theoretical foundation
		Culturally relevant pedagogy (CRP) is a pedagogical approach, developed by Gloria Ladson-Billings in 1994, that addresses student achievement, affirms, and uses the student's culture, and develops sociopolitical consciousness (Ladson-Billings, 1995). CRP was developed to identity effective strategies for teaching African American students and to guide teachers in addressing gaps in academic achievement of minoritized students using culture (Ladson-Billings, 1995). The CRP theory is right for the study because of the focus on minoritized students and academic achievement. Culturally relevant pedagogy impacts students emotionally and academically (Bracken & Wood, 2019). Student anxiety and stereotype threat were significantly reduced when culturally relevant images were used with college students on an ACT-like assessment measuring math and verbal abilities (Bracken & Wood, 2019). The study will contribute to the theory by describing how elementary teachers that use culturally relevant pedagogy describe the influence of the tenets of culturally relevant feedback on African American 3rd through 5th grade elementary student's math achievement.
		Three tenants of the theory:
		Teacher cultural competence Critical Consciousness Academic Success

		Review of literature topics **Theme: Learning and Culture:** This theme involves an examination of interconnectedness of learning and culture (Oxford & Gkonou, 2018), relationships and context (Osher et al., 2020), and culture versus context (Savard & Mizoguchi, 2019). **Theme: Cultural Competence:** This theme involves an examination of cultural competence tenet within Culturally Relevant Pedagogy (Ladson-Billings, 1995; Polleck & Yarwood, 2020). The theme involves cultural competence applied in other fields as well as the classroom. **Theme: Sociopolitical/Critical Consciousness**: This theme involves an examination of the sociopolitical/critical consciousness tenet within Culturally Relevant Pedagogy (Freire, 2020; Ladson-Billings, 1995). The theme involves sociopolitical/critical consciousness from both the teacher and student perspective **Theme: Strategies for Academic Success**: This theme involves a discussion of the CRP element according to Ladson-Billings (1995). Hinderances to academic success will be addressed including deficit ideology (Lasater et al., 2021), teacher disposition (Stephens, 2019), teacher noticing (Louie, 2018), and students and teachers as learners (Hackenberg et al., 2020).

			Theme: Teacher Feedback Practices in Mathematics: This theme involves a discussion of feedback (Wullschleger et al., 2020), feedback and learning (Brooks et al., 2019), feedback and mathematics (Wong et al., 2018).
3.	**Problem Statement** - Describes the problem to address through the study based on defined needs or problem space supported by the literature		It is not known how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction.
4.	**Sample and Location** – Identifies sample, needed sample size, and location (study phenomena with small numbers).		**Location:** The United States of America. **Population:** elementary teachers in the United States of America (1.8 million). The largest group of eligible participants based on upon at least one common criteria (Asiamah et al., 2017). **Target Population:** grade level teachers of third through fifth grade students in public elementary schools in Arizona. **Sample: (convenience)** Those drawn from the target population and willing to participate (Asiamah et al., 2017). Sample will include 15-20 grade level math teachers of African American students in Arizona. The third through fifth grade teachers are members of Facebook groups and that use culturally relevant pedagogy. One focus group with 6-10 teachers will be the second method of data collection. The participants differ from those participating in the interviews.

5.	**Research Questions** – Provides research questions to collect data to address the problem statement.	RQ1: How do elementary teachers describe the development of their culturally relevant pedagogy to provide feedback to students? RQ2: How do elementary teachers describe their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction?
6.	**Phenomenon** - Describes the phenomenon to be better understood (qualitative).	The phenomenon of interest involves how elementary teachers develop their culturally relevant pedagogy and use of their culturally relevant pedagogy in providing feedback to African American third through fifth grade elementary students during math instruction.
7.	**Methodology and Design** - Describes the selected methodology and specific research design to address the problem statement and research questions.	The methodology is qualitative. The design is descriptive.
8.	**Purpose Statement** – Provides one sentence statement of purpose including the problem statement, methodology, design, target population, and location.	The purpose of this qualitative descriptive study is to explore how elementary teachers describe the development of their culturally relevant pedagogy in providing feedback to students and their use of culturally relevant pedagogy in providing feedback specifically to African American third through fifth grade elementary students during math instruction in Arizona.
9.	**Data Collection** – Describes primary instruments and sources of data to answer research questions.	Responses from Teachers in Interviews: (10-15 participants) The semi-structured interviews contain open-ended questions related to the research questions with opportunities to ask follow-up questions allowing the participants to provide additional information.

| | | Responses from Teachers in a Focus Group: (1 group, 6-10 participants) The focus group will be the second method to collect data. The participants in one focus group will differ from those is the interviews.

Steps:

1) Develop interview guide

2) Expert panel to review interview guide

3) Field test interview and focus group questions

4) Site permission from Facebook Groups Administrator

5) IRB Approval

6) Participants will be invited via social media (Facebook groups)

7) Participants will be offered an incentive to participate ($10 gift card)

8) Participants will receive the informed consent form via email and sign via electronic DocuSign

9) Schedule interviews and focus group

10) Conduct interviews and focus group

11) Transcribe interviews and focus group using transcription service

12) Compile and clean data by identifying and correcting errors on the transcripts |
|---|---|---|

		13) Send copy of transcripts to participants for member checking 14) All participants who return the transcripts from member checking will receive a $10 gift card 15) Complete Data Collection
10.	**Data Analysis** – Describes the specific data analysis approaches to be used to address research questions.	One on one interviews and focus groups will be recorded and coded for identification of themes to address the research questions. Conduct thematic analysis and coding according to Braun and Clarke (2006) method to answer the research questions.