Forming Positive Classroom Environments Through the Use of a Culturally Responsive-Sustaining Mixed Reality Intervention Package

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Submitted to the Graduate Faculty of the

School of Education in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy

University of Pittsburgh

2022

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

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Forming Positive Classroom Environments Through the Use of a Culturally Responsive-Sustaining Classroom Management Intervention Package

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University of Pittsburgh, 2022

As classrooms become more diverse and inclusive, classroom management is a consistent issue that new teachers, in particular special education teachers report being ill prepared for. The enactment of Every Student Succeeds Act (ESSA, 2015) and continued punishment referral patterns have given rise to concerns regarding the overuse of exclusionary disciplinary practices and their harmful effects. ESSA (2015) now mandates the use of positive behavior interventions by schools. Given this mandate and the education departments push to restructure discipline systems, the growing special education teacher shortages and voiced struggles expressed by teachers for working in diverse inclusive settings, an investigation of classroom management training during pre-service years is warranted.

Using a pre-test post-test randomized controlled design this study explored the efficacy of a culturally responsive-sustaining classroom management (CRCM) training package on pre-service teachers culturally responsive self-efficacy scores and positive/negative interactions within a mixed reality classroom setting. Eight pre-service special education teachers were randomized to either an intervention or control group. The intervention group participated in a one hour culturally responsive classroom management training and received performance feedback after observations. Culturally responsive classroom management training covered the following topics: positive framing, communicating in culturally consistent ways, behavior specific praise, cultivating relationships, discipline gap, recognizing ethnocentrism and implicit biases in

classroom management approaches. Each pre-service teacher in the intervention and control group was recorded teaching a lesson in a mixed reality classroom prior to intervention and post intervention. Findings indicate that pre-service teachers who received the CRCM training on average had higher culturally responsive classroom management self-efficacy scores post-test than those in the control group. Findings also indicated a significant change in positive verbal interactions between pre-test and post-test. Pre-service teachers who participated in the study reported feeling more prepared to work with diverse learners and better able to respond to student behaviors.

Table of Contents

List of Tables

List of Figures

Preface

I dedicate this work to all of the students that I have had the honor of serving as their educator. I hear you and I see you.

A sincere thank you to my family and friends who provided tremendous support throughout this process. Your support and consistency within my life enabled me to be successful in taking up this work. To my mom, this would not be possible without the strong foundation that you provided. You instilled a love for service, teaching and learning within me at a very young age.

I'd like to thank my advisor, Dr. Douglas Kostewicz for your guidance, expertise and advice throughout my doctoral journey. To my committee, Dr. Conway, Dr. Delale-O'Connor, and Dr. Robertson thank you for providing your time, feedback and support of my research.

To my cohort, you have all been such a great support system and an amazing group of critical thinkers that challenged and pushed my thinking to new levels.

1.0 Introduction

The U.S. educational system serves as a microcosm of the larger society (Weinstein et al., 2003). Within this microcosm, school policies (e.g., 'get tough' and zero tolerance policies) and teacher practices (e.g., exclusionary disciplinary practices, increased reliance on school resource officers, and etc.) perpetuate broader social challenges and structural inequities (Feldman, 2018; Darling-Hammond, 2015; Weinstein et al., 2003). Perpetuation happens through promotion of policies and practices that feeds a pipeline to prison disproportionately across groups of students (Fitzgerald et al., 2018; Gregory et al., 2010; Losen & Martinez, 2013).

Scholars have used the term 'school to prison pipeline' and 'cradle to prison pipeline' to represent a national crisis of systemic barriers that funnel and push Black, Indigenous, People of Color (BIPOC), students from low-income backgrounds, students with disabilities, and emergent bilingual students to the juvenile justice system (Delale-O'Connor et al., 2017; Milner, 2018). Throughout this paper, the term 'school to prison pipeline' will be used to acknowledge the practice of pushing students who live at the intersection of race and poverty out of school and toward the juvenile and criminal justice systems. Although many social and economic factors influence a child's chances of incarceration (e.g., housing instability, health care access, reduced access to employment or education), the criminalization of childhood behavior that happens alongside implementation of exclusionary disciplinary practices within spaces that serve a high proportion of BIPOC students is a major contribution to the school to prison pipeline (Kim et al., 2010; Noguera, 2005; Schiff, 2013).

A crucial part of dismantling the school to prison pipeline and clearing a path for accessibility and opportunity is reducing the use of exclusionary and punitive disciplinary practices

by school practitioners. A substantive amount of research and provisions within teacher education standards (e.g., Council for Exceptional Children Standards for Multicultural Competence, 2012) and educational policies (i.e., Every Student Succeeds Act, 2015) have illuded to a few recommendations for reducing exclusionary disciplinary practices (Cook et al., 2016). Those recommendations include additional teacher support and training on the use of proactive classroom management (MacSuga-Gage et al., 2012) and culturally responsive practices (CEC, 2012; Weinstein et al., 2004). However, scant research has empirically examined the impact of an intervention package that incorporates proactive and culturally responsive strategies with pre-service teachers. Therefore, this study will seek to explore the influence of a classroom management package with each of the aforementioned components.

In this study, the term classroom management is understood as the actions and arrangements a teacher makes "to create an environment that supports and facilitates both academic and social-emotional learning" (Evertson and Weinstein 2006, p.4). In addition, it involves, "planning, facilitating and monitoring experiences that are conducive to high levels of learning for a wide variety of students" (Gay, 2003). Proactive classroom managers take a positive approach to respond to classroom management dilemmas in the classroom. In addition, proactive classroom managers facilitate the growth of students with a "can do" attitude and authoritative style (Delpit, 2006), and organizes the classroom to promote positive behavior (Milner et al., 2019). Moreover, as academic instruction is delivered proactive classroom management strategies are implemented ongoing. On the contrary, reactive approaches such as exclusionary disciplinary practices negatively influence school climate (Gregory et al., 2011; Spoden & Fricke, 2018), prevent students from making academic progress (Gregory et al., 2010), and increases unwanted behavior frequency and intensity over time (Mayer, 1995; Mayer & Butterworth, 1979; Sugai &

Horner, 2002). Research findings show that for every suspension a student's chance of graduating from high school is lowered by 20% (Gregory et al., 2016). Nationally, BIPOC students rank high on out-of-school suspension and expulsion rates (i.e., 1.1 million Black students, 660,000 in special education, 600,000 Latinx, 210,000 multilingual students; Losen et al., 2015; U.S. Department of Education, 2016). While these findings and statistics demonstrate detrimental effects and a strong need for additional teacher training on classroom management, many pre-service teachers believe they are insufficiently prepared to effectively implement classroom management practices (Oliver & Reschly, 2010).

As the heterogeneity of students in classroom spaces rises amidst the teaching force remaining predominately white, monolingual, and middle class (Conner, 2010), classroom management remains a major challenge faced by novice general and special education teachers leading to teacher stress and high attrition (Evertson & Weinstein, 2006; Greenberg et al., 2014; Simonsen & Myers, 2015). In urban classrooms, approximately 50% of teachers leave the classroom within the first three years (Berry et al., 2002). Additionally, teachers teaching in schools with 25% or more BIPOC students were more likely to leave teaching or move, in comparison to schools with less than 25% BIPOC, controlling for school size and student poverty (Carver-Thomas & Darling-Hammond, 2017). Researchers have also found that even teacher concerns about classroom management are intensified in settings that are comprised of highly diverse student populations (Milner et al., 2019).

Inadequate preparation in serving culturally and linguistically diverse students, and inadequate classroom management training during preservice preparation have been cited as reasonings for classroom management difficulties (Oliver &. Reschly, 2007; Melnick & Meister, 2008). Pre-service teachers receive little opportunity to acquire and practice a variety of classroom

management strategies before entering the field (Stough & Montague, 2014). Courses are criticized for being too general and lacking depth (Evertson & Weinstein, 2006). In an evaluation of university special education teacher preparation programs, Oliver and Reschly (2010) found most programs emphasized reactive approaches and very few had courses dedicated to classroom management. In a review of state policies regarding preservice teacher preparation and course catalogs in classroom management, Freeman et al. (2014) found that evidence-based or research-based practices were not emphasized in course catalogs. In addition, courses during pre-service teacher training on classroom management frequently lacked conversations regarding race, class, or cultural and linguistic impacts. Pre-service teachers have been reported to often express fear or resistance to working with students from backgrounds different from their own (Gay & Kirkland, 2003). Thus, when ill-equipped pre-service teachers who lack the disposition to guide diverse groups of children enter the field, they may frequently encounter classroom management challenges and resistance from students (Gay, 2013).

1.1 Culturally Responsive-Sustaining Classroom Management and Positive Learning Environments

At the foundation of the development of a positive, caring classroom learning environment is the ability of pre-service teachers to deliver culturally responsive-sustaining classroom management practices (Milner et al., 2019). The monocultural teacher approaches to classroom management convey that the behaviors of the dominant culture are the standard for success and any deviation is viewed as a deficit or problematic on the part of the culturally linguistically diverse learner. Behaviors of students are more positive in classrooms where students feel they are

supported, belong, and are relevant rather than incongruent (Gay, 2013). Culturally responsiveness demands for a positive caring classroom environment that is flourished through positive relationships between the teacher and the student (Gay, 2002; Ladson-Billings, 1994; Weinstein et al., 2004). In addition, culturally responsive-sustaining practices encourages students to maintain their cultural practices from home and pushes teachers to question the deficit lens that may exist. When working with students, some teachers are not aware of their own implicit management decisions and because countless teachers adopt color-blind ideologies with students, the classroom management decisions that are made could be harmful to students (Milner et al. 2019). Therefore, pre-service teachers must continuously grapple with the convergence of their classroom management practices and cultural competency. Gay's (2002) seminal work described five core elements for preparing pre-service teachers to be culturally responsive: cultural diversity knowledge base, culturally relevant curricula, demonstrate cultural caring and building a learning community, cross cultural communications, and cultural congruity in classroom instruction. To extend culturally responsive teaching practices to a classroom management application Weinstein et al. (2003, 2004) described that teachers must do the following: recognize one's own ethnocentrism and biases to understand that definitions of appropriate or inappropriate behavior is rooted in culture; develop knowledge of student's cultural backgrounds; awareness of the broader social, economic and political context; ability and willingness to use culturally appropriate management strategies; and, commitment to building caring classroom communities. In an examination of culturally responsive classroom management practices of thirteen teachers Brown (2004) found that teachers avoided power struggles, did not humiliate students, but instead set clear expectations and established the classroom as a place of learning.

1.1.1 Increasing Positive and Negative Communication Behaviors

Embedded within the framework of culturally responsive (sustaining) classroom management is the relationship factor (Milner et al.,2019). One understudied technique of proactive classroom management that helps to foster positive learning environments and centers the development of a relationship is the implementation of high ratios of positive-to-negative communication behaviors between teachers and students (Conroy et al., 2009). Within the behavioral literature, positive interactions have been referred to instances when the teacher interacts with a student who is engaged in teacher acceptable behavior (Sprick et al., 2008), or to show approval for student behaviors. Reviewed literature indicates that positive interactions can be achieved through a variety of teacher behaviors. One highly effective behavior is teacher praise. Teacher praise has been found to motivate students in ways that decreases challenging behaviors (Conroy et al., 2009). Teacher praise is defined as any verbal statement or gesture indicating teacher approval of a desired behavior and can be delivered in the form of general or specific (Jenkins & Flores, 2015). Teacher praise that includes specific statements about a child's behavior explicitly shows children which behavior is desired and acknowledged (Conroy et al., 2009).

Contrastingly, negative interactions are instances when the teacher either displays disapproval, reprimands, or provides correction in response to a student's behavior (Cook et al., 2017; Pisacreta, Tincani, Connell, & Axelrod, 2011). The element of coercion may also be used to describe some of the above negative interactions when there is confrontation, power battles, or threats (Alderman & Green, 2011). Although positive interactions would be ideal, it was reported in literature that rates of teacher praise and positive communication behaviors are underused (Rathel et al., 2008), instead, negative teacher interactions tend to occur more frequently (McClowry et al., 2013).

Various studies have explored how increasing a teachers positive-negative interaction ratio impacts student development across social, emotional, behavioral and academic areas (McGrath & Van Bergen, 2014). For example, Cook et al. (2017) trained general education teachers on how to achieve a 5:1 positive to negative interaction ratio. Results of this study indicated improvements with students' academic engagement and a decrease in disruptive behavior. Rathel et al. (2008) used a multiple baseline design to examine the effects of performance feedback on pre-service teachers rates of positive and negative communication behaviors. Findings showed that specific performance feedback increased the ratio of positive and negative teacher communication behaviors. Other research on positive-negative teacher communication behaviors suggest that teacher preparation should emphasize improving the positive-negative ratio rather than adherence to an arbitrary rule such as 5:1 ratio (Sabey et al., 2019).

Scholars such as Delpit (2009), Gay (2013), Weinstein (2004), and Milner et al. (2019) provide an understanding and framework for conceptualizing culturally responsive classroom management. Culturally responsive classroom management is more than control and compliance. Culturally responsive classroom management involves "creating and sustaining classroom environments that are personally comfortable, racially and ethnically inclusive, and intellectually stimulating" (Gay, 2013). Teacher training in proactive classroom management paired with culturally responsive teaching practices is necessary for both those seeking general and special education teacher paths. However, since previous research has found BIPOC students with disabilities are overrepresented within the juvenile justice system (Osgood et al., 2010), and disproportionately suspended (Achilles et al., 2007) it becomes very imperative to strategically place efforts on training special education teachers to use effective practices. Practices that work to reduce the use of exclusionary disciplinary practices and create positive learning environments

(Oliver & Reschly, 2010). One new promising skill building approach to bridging the connections between theory and practice in teacher education without the high stakes of causing real student harm is the use of mixed reality simulations (Bradley & Kendall, 2014).

1.1.2 Mixed Reality Simulations

A simulation is a "accurate, valid and dynamic model of reality implemented as a system" which "allows users to encounter problem situations, try decisions and actions, experience the results and modify their behavior without risking harm" (Kaufman & Ireland, 2016, p. 261). In comparison to role playing, where pre-service teachers may focus more on the acting skills or experience a potential lack of structure in how the role-playing scenario should unfold or what it should entail, during simulations students focus more on building their individual skills (Petracchi & Collins, 2006). While practicum experiences also provide valuable learning and practice experiences, they tend to be susceptible to many problems including: poor integration of university curriculum, host teacher's ineffective teaching practices, and lacks opportunity to work with students with disabilities (Kaufman & Ireland, 2016).

Simulations have also been used in previous research studies with students across other fields to help develop culturally competent practitioners. Across these studies, engagement in simulation activities have been touted as being a way for students to gain insight into their identity (e.g., race, gender, physical abilities, SES, ethnicity etc.) and how it positions them within society (Brown et al., 2020). The simulations allowed students to practice ways to engage with students that do not harm or offend the students' cultural background. Although relatively uncommon in teacher education compared to business, medical and health education, simulations have many advantages for learning and practice. Therefore, this study will seek to use simulations, in

particular mixed reality simulation, with intent to add to the small special education teacher education literature base on the usage of simulations for classroom management and culturally responsiveness.

1.2 Purpose and Research Questions

The purpose of this study is to examine the effects of a culturally responsive classroom management intervention using mixed reality simulations. The research questions this study sought to answer were:

1. What effect does a culturally responsive classroom management intervention package using positive and negative interaction strategies have on pre-service special educators' frequency of positive and negative verbal interactions in a mixed reality environment?

    1. To what extent did the frequency of positive and negative verbal interactions improve for preservice teachers in the intervention condition relative to pre-service teachers in the control condition?

2. To what extent did participation in the culturally responsive classroom management intervention influence pre-service teachers' belief that they could implement culturally responsive classroom management practices?

3. To what extent did teachers find the intervention acceptable and effective?

2.0 Literature Review

While most of the previous literature regarding classroom management has focused mainly on "fixing kids", the emphasis of the Every Student Succeeds Act (ESSA, 2015) on school accountability and teacher quality provoked the restructuring of a variety of policies and systems that impact classroom management practices and pre-service special educator behavioral training (McLeskey et al., 2017). Under Title I, states and districts are required to describe how they will support districts and schools in reducing the overuse of exclusionary disciplinary practices and behavioral interventions that compromise student health and safety. Thus, necessitating preparatory training to emphasize effective behavioral interventions. In addition, the ESSA (2015) emphasizes the use of a preventative tiered framework through the use of a multi-tiered system of support and positive behavioral interventions to increase access to effective behavioral instruction. The ESSA (2015) also recognizes the incorporation of efforts such as student mental health and trauma-informed services into positive behavior intervention support frameworks. The aforementioned behavioral intervention policy mandates have the possibility of influencing what components are stressed when preparing teachers on the topic of classroom management (McLeskey et al., 2017).

2.1 Purpose of the Current Systematic Review

Scant literature has studied classroom management interventions for pre service special educators at the teacher level and even less literature has studied the structure, characteristics and

outcomes of classroom management interventions post ESSA (2015). As the ESSA (2015) has been implemented for a few years, it's important to understand what classroom management intervention/training packages are being used with pre service special educators to implement classroom management interventions after the enactment of these mandates.

The approach to examining the literature on classroom management interventions targeting pre service teachers was that of systemic review (Thomas & Harden, 2008).

This review addresses the following questions:

1. What are the effects of interventions examined since the passing of the ESSA (2015) act that focus on building preservice special educators' knowledge and skills regarding classroom/behavior management techniques?

   a. What are the backgrounds of the participants and in what types of settings have researchers studied classroom management for pre-service special education teachers?

   b. What are the characteristics of the interventions?

   c. What outcomes have been examined upon implementation of the intervention?

2.2 Methodology

2.2.1 Inclusion and Exclusion Criteria

To ensure that the review was governed by a set of rules target studies had to meet all of the following criteria for acceptance in this systematic literature review:

1. Articles were published in English in a peer reviewed journal.

2. Articles were published after the historical passing of Every Student Succeeds Act (ESSA) December 2015 to October 2021. The ESSA Title 1 provisions marks the first time that the federal government required state educational agencies to describe and report their plans and progress in supporting local education agencies in reducing a.) bullying and harassment, b.) the overuse of discipline practices that remove students from the classroom, and c.) the use of aversive behavioral interventions (National Council on Disability, 2018). Furthermore, this date is also a critical point to review literature because the ESSA (2015) provisions also provoked state discussions on enhancing pre service teacher education to better prepare them for the realities of the classroom especially in high need areas.

3. Participants were students enrolled in special education teacher preparation courses and/or considered a special education pre-service/teacher candidate with the study taking place within the United States. Studies occurring outside the United States (e.g., Dockerty, 2019; O'Neill, 2016) or did not include preservice special educators (i.e., general education or in-service teachers) (e.g., Sallese & Vannest, 2020) or did not disaggregate special educator's data were excluded (e.g., Larson, Hirsch, McGraw, & Bradshaw, 2020).

4. Directly measured the effects of at least one independent variable (i.e., implementation of a classroom behavior management targeted strategy intervention) on a change in a dependent variable (i.e., knowledge and/or skills) preservice special educator. For the purposes of this paper, a classroom behavior management intervention is the creation of systems that support positive behavior within the classroom (e.g.., opportunities to respond, practice, praise, feedback).

2.2.2 Search Procedures

A computerized systematic search of three databases (i.e., Educational Resources Information Center (ERIC), PsycArticles and PsycINFO) was initially conducted. The following terms: ("pre-service" or "teacher candidate" or "preservice" or "student teacher") AND ("special education" or "special need*" or disabilit*) AND ("classroom management" or "behavior management") served as the descriptors used for the Boolean search that was entered into the search fields of ERIC, PsycINFO and PsycArticles in October of 2021. Variations of these terms were not used, only the spellings, as shown. In addition to the date restriction, the initial search was narrowed to only pull articles that were peer reviewed and written in English. The computerized search using these initial parameters yielded 55 total articles. Of those, 12 articles were generated from PsycArticles and PsycINFO and 43 from ERIC. The titles and abstracts of the articles were reviewed to identify studies that matched the criteria for inclusion. Next, articles that were duplicates amongst the three databases were omitted. Application of the full inclusion and exclusion criteria resulted in 6 articles meeting criteria to be within the sample for this literature review (Hudson et al., 2019; Kirkpatrick et al., 2021; Klopfer et al., 2019; Markelz et al., 2018; Peterson-Ahmad, 2018; Sciuchetti & Yssel, 2019)

Additionally, as a journal known to report on teacher development, a hand search of Teacher Education and Special Education was also completed to find additional studies. One additional article was found during the hand search (Dawson & Lignugaris-Kraft 2016). An ancestral search of the identified articles that fit criteria followed the computerized and hand search resulting in one additional article (Hudson et al., 2018)

2.2.3 Coding Procedures

To evaluate the 8 articles a systematic process was followed. First, a table was created using Microsoft Excel that included each article cited on individual rows. Next, vertical columns were created to capture pre-determined key information from the studies to aid in synthesis of the information. The columns included sections for participants and settings (student's major or type of preparatory program, number and age percentages of participants), intervention utilized (type of intervention, duration of the intervention, frequency of the intervention), dependent variables, type of methodology, procedures, IOA, and results of the study. Anecdotal notes were placed in the appropriate cells as each article was reviewed. One author coded all studies. Discussion and consultation with a colleague were also done to clear up any discrepancies with regards to inclusion or exclusion of articles.

Review of articles about classroom managmeent interventions that studied intervnetions for pre service special educators

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Initial search yielded 55 studies

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6 articles were selected for an abstract review

↓

Hand search and ancestral search yielded 2 additional articles,

↓

A total of 8 articles met inclusionary criteria
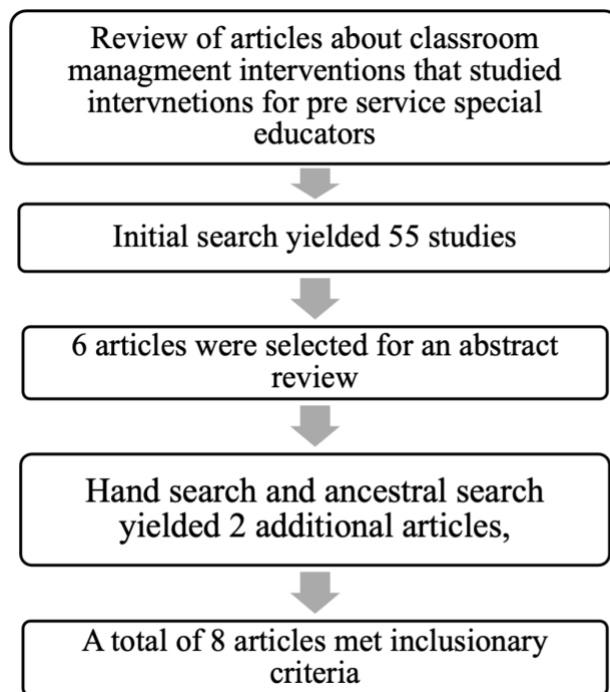
Figure 1 Selection Process

2.3 Results

Of the 8 studies examining the effects of classroom behavior management interventions on the skills and knowledge of pre service teachers, articles were published between the years 2016 and 2021. In addition, a little more than half of the articles were published within the last three years. Study articles were published across a variety of peer reviewed journal topics including behavior specific journals (1), teacher education or training journals (3), special education (2), technology or virtual reality (2), and education sciences (1). Three of the articles were single case multiple baseline designs, one used a randomized control trial, whereas four used mixed methods. Coding results were synthesized by the following participant descriptions and setting, intervention characteristics, dependent variables (measures and social validity), and outcomes of the study. Below, we provide a descriptive summary of the studies. A descriptive summary of included studies is also provided in Appendix A.

2.3.1 Special Education Pre-service Teacher Participants

A total of approximately 167 undergraduate or graduate level pre service teachers were included in 8 studies. Four of these studies (50%) (Hudson et al., 2019; Hudson et al., 2018; Kirkpatrick et al., 2021; Peterson-Ahmed, 2018) were conducted with undergraduate students; two (25%) (Dawson & Lignugaris-Kraft, 2016; Markelz et al.,2018) were conducted with graduate-level participants; two studies (25%, Klopfer et al., 2019; Sciuchetti & Yssel, 2019) did not explicitly provide the status of the participating students in the study. Of the eight studies, four reported pre-service teacher's previous classroom management experience and training while one reported prior teaching experience. Two of the studies (Hudson et al., 2019; Hudson et al., 2018)

reported that it was the students first time learning and applying classroom management strategies, where as one study (Kirkpatrick et al., 2021) reported that all but one of the participants reported no prior experience with behavior management interventions. One study (Klopfer et al., 2019) reported that pre service teachers received six hours of education in general classroom management prior to the intervention.

There were two studies (25%) (Hudson et al., 2019; Hudson et al., 2018) that included pre service teachers who were majoring in special education general curriculm or adapted curriculum; one study specifically included students concentrating on mild/moderate alternative teacher preparation (Dawson & Lignugaris-Kraft, 2016); three studies (38%) (Kirkpatrick et al., 2021; Markelz et al., 2018; Sciuchetti & Yssel, 2019) were conducted with participants seeking dual certifications.

Five of the studies provided information about the age range for participants, which ranged from 18 to 45 years old with the majority of participants across the studies falling within the 18- to 29-year-old range. The same five studies also provided information related to ethnicity and race; less than 10% of the participants were of a minoritized background. Three articles did not de-aggregate by race. Seventy eight percent of the participants within the identified sample of studies were female.

Special education pre service teachers' participants were recruited to participate in the studies primarily through purposeful sampling (Dawson, et al., 2017; Hudson et al., 2018; Hudson et al., 2019; Kirkpatrick et al., 2021; Markelz et al., 2018; Sciuchetti, et al 2019). Two studies used random selection. For example, Peterson-Ahmad (2017) randomly selected participants from a pool of interested individuals and Klopfer et al. (2019) had students chose an elective course for which they were randomly placed in either the intervention or control group.

2.3.1.1 Student Participants

Across the eight studies, student participants were included in the form of avatars for 50% of the studies (Dawson & Lignugaris-Kraft, 2016; Hudson et al., 2019; Hudson et al., 2018; Peterson-Ahmad, 2017). Within these four studies, there were 20 student avatars in total represented. Two of the studies used middle school students (Dawson & Lignugaris-Kraft, 2016; Hudson et al., 2018), one used fifth graders (Hudson et al., 2019), and one study did not report the grade of the students (Peterson-Ahmad, 2017). Four studies included students from special education preservice teachers' placements (Kirkpatrick et al., 2021; Markelz et al., 2018; Sciuchetti & Yssel, 2019) and in particular Dawson et al (2016) tested the generalization of skills learned in the mixed reality environment using avatar students with elementary students in grades 2-4th at the pre-service teacher's placement. Across these four studies, two studies reported that the students were early childhood/elementary students (Kirkpatrick et al., 2021; Dawson et al., 2016), one study was 6th graders (Markelz et al., 2018) and one study did not report the grade level of students (Sciuchetti, 2019). Four of the studies reported that students were diagnosed with a disability (Dawson & Lignugaris-Kraft, 2016; Kirkpatrick et al., 2021; Markelz et al., 2018; Sciuchetti et al., 2019). Two of the studies reported that student participants were identified with emotional and behavioral disabilities (Markelz et al., 2018), learning disabilities (Markelz et al., 2018), autism spectrum (Kirkpatrick et al., 2021), and dyslexia (Kirkpatrick et al., 2021). Pre-service teachers worked in groups of 3 to 8 student participants at their placement sites. One study did not have any student participants and instead used college student actors to role play as students (Klopfer et al., 2019).

2.3.1.2 Setting

The location of universities for pre-service special educator participants were also spread out across different areas of the United States (e.g., southwestern, southeast, and western) thus the participants in the included studies represented a wide spectrum of special education pre service teachers. The setting for which the participants implemented the intervention varied between a mixed reality environment conducted in a university classroom lab (Dawson & Lignugaris-Kraft, 2016; Hudson et al., 2019; Hudson, Voytecki, & Zhang, 2018; Peterson-Ahmad 2018). Three of the studies were also conducted at the special education pre service teachers' placement/field base experience (Dawson et al., 2016, Kirkpatrick et al., 2020; Markelz, 2018, Sciuchetti & Yssel, 2019). For example, Kirkpatrick et al. (2020) collected data during the participants field experiences at a university affiliated treatment center for students with developmental disabilities. Markelz et al. (2018) conducted the study during the participants teaching practicum at a rural school district in a 6th grade resource classroom with students diagnosed with learning disabilities and/or emotional and behavioral disabilities. Two studies had a setting primarily in the participants university lecture classroom (Klopfer et al., 2019; Sciuchetti & Yssel, 2019).

2.3.2 Research Designs

Regarding research design, researchers used a variety of methods to evaluate the efficacy of interventions that focus on building preservice special educators' knowledge and skills regarding classroom/behavior management techniques. Four of the eight studies utilized a mixed method design (Hudson et al., 2019; Hudson et al., 2018; Sciuchetti & Yssel, 2019; Peterson-Ahmad, 2018). Each of these studies utilized thematic coding of the studies' qualitative data. Of the four studies that used a mixed methods design, three of the studies reported triangulation of

data from qualitative and quantitative aspects of the study. One study used randomized control trial (Klopfer et al., 2019), while three of the studies utilized a single case methodology (Dawson et al., 2016; Kirkpatrick et al., 2021; Markelz et al., 2018). All three of the studies that used a single case methodology specifically used multiple-baseline. One of the single case studies used a multiple baseline across participants while two of the three single case studies reported using a multiple baseline across behaviors/skill (Dawson et al., 2016; Markelz et al., 2018) for which replications of the intervention occurred for the same pre-service teacher across three different behaviors. Only one study incorporated a generalization phase within the study to a real-life classroom (Dawson et al., 2016). A maintenance phase was incorporated in three of the study designs (Dawson et al., 2016; Kirkpatrick et al., 2021; Klopfer et al., 2019).

2.3.3 Intervention/Independent Variable Characteristics

The intervention agent/implementer was described in three of the studies as the instructor/professor (Hudson et al., 2019; Hudson et al., 2018; Klopfer et al., 2019), three studies reported the researcher (Dawson et al., 2016; Kirkpatrick et al., 2021; Markelz et al., 2018) and two studies did not report the intervention agent (Peterson-Ahmad, 2017; Sciuchetti, 2019). Technology tools were incorporated by the intervention agents throughout the majority of the studies, however more than half of the studies' used technology as a primary way for implementing the intervention. For example, 50% of the studies utilized Teach Live/Mursion virtual classroom simulations as an opportunity for teachers to practice skills (Dawson et al., 2017; Hudson et al., 2019; Hudson et al., 2018; Peterson-Ahmad, 2018) and one study used apple watch technology to send text messages for prompting (Markelz et al., 2018). In addition to the use of technology, other materials used throughout the interventions included materials to support lesson implementation

when working with virtual or in person students. For example, three studies required participants to implement literacy instruction to students concurrently with demonstrating a classroom management skill (Dawson et al., 2017; Kirkpatrick et al., 2020; Markelz et al., 2018). Kirkpatrick et al. (2020) required participants to use the CORE Phonics Survey and materials for teaching children how to blend phonemes with students during data collection of the use of a token economy; Dawson et al. (2017) required their participants to utilize the STORYtown program/ Bold Moves language arts vocabulary lessons during their immersion experience with virtual students. In contrast, one study did not use reading/language arts materials and instead required participants to teach lesson from the Focusing Together: Promoting Self-Management Skills in the Classroom (Peterson-Ahmad, 2018).

2.3.3.1 Intervention Components.

Other characteristics included the various components of the interventions implemented among the eight studies. Strategically aligned course work series or instruction was a component of three studies (Kirkpatrick et al., 2020; Klopfer et al., 2019; Sciuchetti et al., 2019). For example, Klopfer et al. (2019) implemented an errorless classroom management course for preservice special education teachers that focused on providing strategies for functional equivalence, reinforcement and extinction as well as ecological, antecedent and rapport-based approaches. Additional components of the interventions are as follows: prompting targeted teaching behaviors (Markelz et al., 2018), coaching (Dawson et al., 2017; Peterson-Ahmad, 2018), feedback (Dawson et al., 2017; Hudson et al., 2019; Hudson et al., 2018; Kirkpatrick et al., 2020) practicum and student teaching placements (Sciuchetti et al., 2019), reflection (Dawson et al., 2017; Hudson et al., 2019; Hudson et al., 2018; Markelz et al., 2018; Peterson-Ahmad, 2018), modeling

(Kirkpatrick et al., 2020), and rehearsal/practice opportunities (Dawson et al., 2017; Hudson et al., 2019; Hudson et al., 2018; Kirkpatrick et al., 2020; Klopfer et al., 2019). Practice opportunities included implementing lessons with student actors or interreacting in the virtual classroom. Dawson et al. (2017) provided a form of different practice for participants by permitting them to have three practice opportunities per session so that they could become familiar with the instructional content to be able to focus on the behavioral target skills. Other components of the interventions within the studies included didactic instruction (Dawson et al., 2017), and behavior skills training using a variety of mediums for instruction (Kirkpatrick et al., 2020).

2.3.3.2 Dosage

In regard to dosage, the length of time that special education preservice teachers received the intervention was different across studies. With regards to the four studies that utilized mixed reality environments, one of the studies (Dawson et al., 2017) reported participants received instruction on providing opportunity to respond during a 93-minute baseline session. In addition, participants of this study watched a video on the target skill for their teaching session for 7 to 12 minutes before each session. Across the four mixed reality studies, participants interacted within the virtual classroom for a range of two to five minutes per session. The number of sessions that each of these studies had ranged from 3 to 15 sessions. The time span for when those sessions took place ranged from five weeks to a full semester. Although reflection sessions were reported in four studies, only two studies reported the self-reflection to last one minute and group reflection sessions lasted about 10 minutes (Hudson et al., 2019; Hudson et al., 2018). The two studies that utilized strategic course planning as the independent variable lasted from a range of nine weeks (Klopfer et al., 2019) to four consecutive semesters over the course of two years (Sciuchetti et al., 2019). With regards to the other two studies, Markelz et al. (2018) conducted 20 sessions 15

minutes each with 10 prompts being sent through the apple watch to the pre service special education teacher on a variable interval schedule with behaviors randomly selected. Kirkpatrick et al. (2019) provided 45 minutes of behavior skills training and each participant was observed twice during their 30 minutes of instruction for a total of four observations per week for a duration of 5 minutes. Participants who did not meet mastery criteria received a one-time 10-minute feedback session.

2.3.3.3 Treatment Fidelity/Procedural Integrity and Social Validity

There were two studies that utilized video recording to score treatment fidelity (Dawson et al., 2016; Hudson et al., 2019) and one study maintained a permanent product (Markelz et al., 2018). Standardized procedures for implementing the intervention were reported across the studies in the form of consulting with experts weekly to ensure adherence to guidelines and consistency across intervention agents (Klopfer et al., 2019), using scripted lesson plan materials (Peterson-Ahmad, 2018), using preparation guidelines (Hudson et al., 2019), and procedural/intervention component checklists (Dawson et al., 2016; Kirkpatrick et al., 2020). Markelz et al. (2018) researchers also reviewed text message prompt records to make sure enough prompts were delivered by the researcher (Markelz et al., 2018).

2.3.4 Dependent Variable and Instrumentation

Across all studies, dependent variables and measurement tools were diverse. Two studies investigated a change in the specific praise rate of participants (Dawson et al., 2016; Markelz et al., 2019). Four studies measured the self-efficacy of participants classroom and behavior management abilities (Hudson et al., 2019; Hudson et al., 2018; Klopfer et al., 2019; Sciuchetti et

al., 2019). The dependent variables also included percentage of correctly delivered error correction steps (Dawson et al., 2016), percentage of correctly delivered praise around steps (Dawson et al., 2016), accuracy of token economy steps completed per session (Kirkpatrick et al., 2020) , frequency per session of opportunity to respond (Peterson-Ahmad, 2018), engagement in active questioning (Markelz et al., 2018), conducting classroom scanning (Markelz et al., 2018), usage of various teaching strategies to manage difficult situations, and attitudes toward children with emotional learning and behavioral difficulties. The dependent variables were operationally defined in two studies (Dawson et al., 2016; Markelz et al., 2018; Peterson-Ahmad, 2018). For example, Dawson et al. (2016) operationally defined classroom scanning as "systematically observing students not in the small group from one side of the classroom to the other."

2.3.4.1 Instrumentation

Four studies utilized surveys/scales as an instrument to measure the dependent variables (Klopfer et al., 2019; Hudson et al., 2019; Hudson et al., 2018; Sciuchetti et al., 2019). Survey instruments that were used were adapted from some of the following likert type survey instruments: Behavior Management Self Efficacy Scale, Teacher Efficacy in Classroom Management and Discipline, Teachers Sense of Self Efficacy Scale, Swiss Teaching Style Questionnaire, Teachers' Attitudes toward Learning and Behavioral Problems Scale, and Participants Perceptions Survey.

Five studies used direct observation to score teachers proficiency with target skills (Dawson et al., 2017; Kirkpatrick et al., 2020; Klopfer et al., 2019; Markelz et al., 2018; Peterson-Ahmad, 2018). In addition to direct observation, target skills were also scored from video footage (Dawson et al., 2017). Four studies used measurement tools that required self-report by participants (Hudson et al., 2019; Hudson et al., 2018; Klopfer et al., 2019; Sciuchetti et al., 2019).

2.3.4.2 Social Validity and Reflection

As an additional dependent measure, three studies explicitly reported information regarding social validity of the intervention (Dawson et al., 2017; Kirkpatrick et al., 2020; Markelz et al., 2018). Questionnaires were utilized for social validity in each of the three studies (Dawson et al., 2017; Kirkpatrick et al., 2020; Markelz et al., 2018). Although not explicitly referenced as social validity, three studies collected reflection data about participants experiences with the intervention (Hudson et al., 2019; Hudson et al., 2018; Peterson-Ahmad, 2017). Three studies did not report social validity data (Klopfer et al., 2019; Sciuchetti, et al., 2019)

2.3.5 Effectiveness of Intervention

To assess the effectiveness of the interventions in changing the skills or self-efficacy as it pertains to classroom and behavior management, examination of outcome data was done closely across all eight studies. Most studies had several outcome variables, ranging from 1 to 4 variables.

2.3.5.1 Proactive Classroom Management Strategies

Five studies examined outcomes focused on enhancing proactive skills/techniques relevant to classroom management (Dawson et al., 2016; Kirkpatrick et al., 2020; Klopfer et al., 201 Markelz et al., 2018; Peterson-Ahmad, 2018). Across all five studies participants improved their usage of proactive classroom management strategies. For example, Peterson-Ahmad (2018) found that participation in Mursion sessions increased pre service teachers use of opportunity to respond between the first and final sessions. Similarly, the frequency of praise (Klopfer et al.,2019), active questioning (Markelz et al., 2018) and classroom scanning (Markelz et al., 2018) increased when participants received an intervention. When observing teaching behaviors, Klopfer et al. (2019)

found that participants who received errorless classroom management training were more likely to use proactive strategies rather than reactive strategies with medium to large effect size (Klopfer et al., 2019). Preservice teachers who received training in proactive methods showed the greatest differences in the use of rapport building and prompting strategies as well compared to untrained teachers (Klopfer et al., 2019).

2.3.5.2 Self-Efficacy

Four studies measured the self-efficacy of participants classroom and behavior management (Hudson et al., 2019; Hudson et al., 2018; Klopfer et al., 2019; Sciuchetti et al., 2019). Two studies noted increased self-efficacy scores (Hudson et al., 2018; Sciuchetti et al., 2019). Two studies reported unchanged self-efficacy ratings as a result of the intervention (Hudson et al., 2019; Klopfer et al., 2019). For example, Klopfer et al. (2019) reported that students enrolled in the ECM course compared to the control group did not differ in self efficacy or endorsement of a teaching style. In another study, Hudson et al. (2019) reported that participant ratings on their teaching ability were highest after the first and second surveys but decreased during their third survey.

2.3.5.3 Other Outcomes

In addition to skills and self-efficacy there were other findings reported across the eight studies. For example, Sciuchetti et al. (2019) required participants to respond to items on a self-efficacy survey in which they self-reported the extent to which they possessed a theoretical or practical understanding of a strategy or technique. Participants rated themselves highest on the following knowledge items: knowing techniques to redirect a disruptive student quickly and having knowledge of the types of rewards to keep students engaged. Findings also included positive emotions and reactions toward students with behavioral difficulties for teachers in the

intervention group compared to teachers who did not receive the intervention (Klopfer et al., 2019).

In addition, participants consistently reported a need in specific evidence-based practices

(Sciuchetti et al., 2019). Participants also learned how to incorporate individualized student needs

in their teaching (Peterson-Ahmad, 2019).

2.4 Discussion

Novice teachers face complex challenges and moral dilemmas consistently within the

United States public school context. One of the most frequently reported challenges cited within

the literature for pre service teachers is classroom management (Kafman & Moss, 2010; Marzano

et al., 2003; Milner, 2019; Oliver & Reschly, 2007; Reed, 1989) Therefore, to better understand

interventions focused on classroom management for preservice teachers this review sought to

investigate the following research questions:

1. What are the effects of interventions studied post Every Student Succeeds Act (ESSA,

    2015) that focus on building preservice special educators' knowledge and skills of

    classroom/behavior management techniques?

    a. What are the backgrounds of the participants and in what types of settings have

       researchers studied classroom management for pre-service special education

       teachers?

    b. What are the characteristics of the interventions?

    c. What outcomes have been examined upon implementation of the intervention?

Eight intervention studies met the criteria for classroom management interventions post

ESSA (2015) targeting pre service special education teachers. Although previous literature reviews

have been conducted to examine the influence of classroom management techniques on student outcomes (Korpershoek et al., 2016), this review specifically examined pre service teachers' outcomes. The discussion that follows will describe four important findings as they relate to the research questions guiding the review.

2.4.1 Participant and Setting Characteristics

Researchers have suggested that inadequate training and preparation for classroom management is a possible cause for the struggle novice teachers report experiencing within their first years of teaching (Hirsch et al., 2021; Hoy et al., 2013; Oliver & Reschly, 2007; O'Neill & Stephenson, 2012). Unfortunately, one important finding of this review is out of the four studies that reported pre-service special educator's prior classroom management training and experience, three reported that prior to the study pre service special educators had no prior experience or training with classroom management interventions. In addition, Klopfer et al. (2019) reported that the pre service teachers in their study received 6 hours of education in general classroom management prior to the intervention. Many of these teachers were at a sophomore or junior level except for the participants in Klopfer et al. (2019) study where the level was not reported, but the mean age was reported to be 27.7 years old. Therefore, suggesting a higher college level. This finding indicates that pre-service special educators were possibly either not going to receive classroom management training outside of the study intervention or not enrolled in a classroom management course until they were further into their preparatory program. In contrast to elementary certification programs where classroom management techniques are woven across multiple methods courses, special education preparation programs have been found to more likely concentrate classroom management content into one or two classes (Freeman et al., 2014). The

isolated classroom management course structure of special education preparation programs reported in the literature appears to resonate with the findings of this review regarding participants of this study. However, adequate exposure and acquirement of classroom management content is critical to beginning teacher's success. In addition to a lack of background/experiences with classroom management this study also found that 78% of the participants were female and less than 10% were of a minoritized background. When examining demographic information on special education teachers 85.6% of special education teachers are female and 77% of special education teachers are White (Non-Hispanic) (DataUSA, n.d.). Although this resonates with the pre-service demographic information collected in this review given that six of the studies used purposeful sampling rather than random selection it is difficult to defend the representativeness of the sample and whether selection of participants based on convenience was appropriate.

2.4.2 Characteristics of the Intervention

Within the field of education lacks a uniformed decision regarding specific elements of classroom management that should be taught or practiced within a preservice preparatory program. However, there is some consensus that when mastering new skills, a learner progresses through a series of learning stages and should be supported through those stages (i.e., acquisition, fluency, generalization, and adaptation; Haring et al., 1978; Myers et al., 2017). When applying this series of learning stages to the characteristics of the eight interventions found within this study a few important noticing's should be mentioned. First, as previously mentioned, many of the pre-service special educators in this study did not have prior experience with classroom management therefore, it is likely that they are in the acquisition stage of learning. The goal of the acquisition stage is for the learner to be able to perform the skills with little adult support although they may not yet be

28

able to perform the task with high accuracy. Since many of the pre service special educators were already far along in their program it's an indication that they may exit their teacher training before becoming fluent in classroom management. This is a reoccurring finding within the field of teacher education and why many novice teachers feel unprepared to deal with challenging behaviors in the classroom (Poznaski et al., 2018).

Another finding with regards to the characteristics of the intervention is that there was a lack of generalizability to the classroom setting as only one study incorporated a generalization phase and the bulk of the studies focused on acquisition and/or fluency. This is an important component of classroom interventions because it demonstrates that the pre service special educator can apply the skill to various situations. The need to teach preservice teachers to generalize skills learned in a university space across time and settings is well established in the literature (Han and Weiss, 2005; Noell et al., 1997; Oliver & Reschly, 2007). Given that inadequate literature exists to inform the field on ways to provide training to help pre service teachers generalize their skills to the K-12 setting, additional research should seek to teach pre service teachers to generalize their acquired skills to their own classroom. Research in the field of programming for generalization has suggested that immediate feedback be given to aide with acquisition of the behavioral skill, and that interventions with pre service teachers should focus on reaching a mastery level rather than a fixed amount of training (Scheeler et al., 2009). This was observed in Kirkpatrick et al. (2020) where feedback was provided to participants who did not meet the post behavioral skill training mastery criteria.

Another noteworthy finding was related to the use of technology. Of the eight studies, four reported using mixed reality classrooms. Previous research has cited that although the goal of many studies is to train pre-service teaches to work with children, children face the risk of being exposed

to ineffective treatment (Sawyer et al., 2017). The use of mixed reality classrooms provides a promising way for pre-service teachers to interact with human like student avatars that are ultimately unaffected by the experience (Ersozlu et al., 2021). Instructors are able to use the technology to create scenarios for pre service teachers to practice new classroom management skills. A literature review on mixed reality technology found that classroom management skill development was the second most common studied research topic used with TeachLive/Mursion technology and is a promising method for preservice special educator teacher development (Ersozlu et al., 2021).

In addition to findings regarding the way pre-service teachers were expected to learn and acquire a new skill, additional findings revealed a lack of attention to a culturally responsive classroom management lens by the intervention agent. Although the construct of culturally responsive classroom management is rather new, the disproportionate suspension and exclusion of Black and Brown students has prompted special attention to the extent that classroom management practices used by teachers are attentive to students' culture and justice oriented (Skiba et al., 2006; Sullivan, 2014; U.S. Department of Ed., 2016; Weinstein et al., 2003). The research on classroom management interventions for special education pre-service teachers has paid very little attention to issues of cultural diversity and vice versa. Milner (2019) reminds us that as teachers remain white, student diversity is increasing creating incongruence that should be attended to when discussing issues of classroom management, diversity and learning. Across the 8 studies of this literature review that focused on classroom management for pre service special educators not one explicitly stated that the intervention incorporated or aided the teachers in a culturally responsive approach. Weinstein et al. (2004) call for the following culturally responsive classroom management practices: (a) engaging in recognition of their own ethnocentrism or biases (b)

communicating in culturally consistent ways (c) awareness of how current practices and policies may reinforce institutional discrimination, (d) creation of inclusive classrooms, and (e), organization of the physical environment to communicate reaffirm connectedness and community. This is an important finding given the urgent need expressed in ESSA (2015) to address the inequitable discipline and classroom management practices that plague public schools. Research on pre service special educators and culturally responsive classroom management is needed.

2.4.3 Measurements and Outcomes

Regarding measurement, five examined outcomes focused on proactive skills/techniques and four measured self-efficacies of participants. Outcomes that used measures of self-efficacy were mixed across the four studies with half showing no change and the other half showing increases. Delale-O'Connor et al. (2017) have cited that teachers can enhance their sense of self efficacy and shape their classroom management practices through three context focused principles: (a) learn about students and build relationships, (b) learn about students outside of school context and (c) recognize and respond to student trauma. It is possible that these varied across the four studies that measured self-efficacy and thus creating different results. However, neither of the studies reported this pertinent information.

Moreover, one measure that was not found within this review, but has been commonly used by practitioners and cited within the literature to proactively manage a positive classroom climate is the ratio of positive and negative interactions (Cook et al., 2017). There is evidence that suggests that positive teacher-student interactions are connected to student's sense of social/school cultural belonging. and their teacher-student relationship (Cook et al., 2018). Many studies have demonstrated that teacher-student relationship factors predict student outcomes and have

protective benefits on student's emotional and behavioral development (Cook et al., 2018; O'Connor et al., 2011). Making pre-service special educators aware of their language use through positive/negative interactions can also bring awareness to the cultural lens for which pre-service special educators see and understand classroom management and student behavior.

In summary, the results of this literature review suggest that classroom management interventions for pre-service special educators appear to have positive results on pre-service special educator's behavior when measures are focused on building proactive classroom management skills. However, the reviewed studies could be enhanced to further understand how pre service special educators respond to training on other proactive management strategies that are rooted in a culturally responsive classroom management framework.

2.5 Recommendations for Future Research

This literature review illuminates the need for additional research to be done on the training of pre service special educators in the area of classroom management. More specifically, further research should investigate the generalizability of practice and training to real world conditions. This will assist in impacting pre-service teachers' self-efficacy, feelings of preparedness and practice during their first few years of teaching. Studies should also include observable behavior of pre-service teachers to include more direct observation of pre-service teacher practices to the literature base. The review also illuminated a need for additional classroom management research to infuse an equity or culturally responsive lens when studying teacher prep or teacher education. If as a country we are to address the devasting impact of exclusionary disciplinary practices in schools with students of color, students below the poverty line, students whose first language is

not English, and students with disabilities then a collective movement needs to be made where researchers are posing research questions that have a concentrated focus on culture, race, power and equity. Lastly, the research has suggested that positive teacher-student relationships are correlated to positive interactions which means a more positive classroom climate and less punitive measures used (O'Connor et al., 2018). Therefore, additional research should seek to investigate pre-service teachers positive and negative interactions with students

2.6 Implications for Future Practice

Issues of special education teacher shortage and attrition have been of great concern to administrators, teacher preparers, and policy makers for decades. As teacher preparers review their current practices and frameworks for teaching pre service special educators how to become classroom managers it is critical that classroom management is not framed as a one size fits all approach or in isolation of culture, power and control. I also encourage classroom management professional development facilitators to provide enough time, practice, and coaching for novice teachers to move beyond acquisition of skills or practices and to provide ample opportunities for teachers to become fluent in their classroom practices, generalize and then adapt when behaviors intensify.

2.7 Limitations

There are several limitations to this systematic literature review. This review had very specific inclusion and exclusion criteria which could have limited other studies done on classroom behavior management with pre service special education teachers. Another limitation to this review was that many measures were used to determine the effectiveness of the interventions which limited the ability to group measures together on the same metric and make true statistical comparisons. Additionally, with little information about the context and student participants for which some of the pre-service special educators implemented their classroom management practices, it is difficult to discern for whom the practices were effective for and not effective for. Moreover, since studies were limited to the United States findings have limited generalizability.

2.8 Conclusion

Identifying classroom management techniques that positively impact the knowledge and skills of preservice special educators is of high priority for addressing the over use of exclusionary discipline practices for minoritized students with disabilities and for retaining teachers in the field of special education. However, it is also a difficult task because effective classroom management requires teachers to have the ability to build positive relationships through positive interactions while being culturally responsive in the midst of possible student and teacher incongruence. The research study that follows this systematic literature review will attempt to intervene on pre-service teachers' implementation of positive and negative interactions using culturally responsive classroom management practices.

2.9 Current Study Purpose and Research Questions

The purpose of this study is to investigate the effects of a culturally responsive classroom management intervention package on pre service teacher's self-efficacy scores and classroom management practices. First this study will examine the effects that the intervention has on a known classroom management practice (i.e., positive to negative interaction ratios) followed by exploring if perceived confidence in the ability to engage in culturally responsive classroom management influences the ratio of positive to negative interactions. Given the evidence that the school to prison nexus continues to remain (Vincent & Tobin, 2011; McIntosh et al., 2014) it is essential to expand on work examining culture and classroom management in an environment that minimizes harm and provides an opportunity for true practice (i.e., mixed reality simulations).

Therefore, this study examines the following research question:

1. What effect does a culturally responsive classroom management intervention package using positive and negative interaction strategies have on pre-service special educators' frequency of positive and negative verbal interactions in a mixed reality environment?

    1. To what extent did the frequency of positive and negative verbal interactions improve for students in the intervention condition relative to students in the control condition?

2. To what extent did participation in the culturally responsive classroom management intervention influence pre-service teacher's belief that they could implement culturally responsive classroom management practices?

3. To what extent did teachers find the intervention acceptable and effective?

While exploratory in nature, I hypothesized that pre-service teachers with a lower ratio of positive to negative interactions would also report lower self-efficacy scores. I also expect that pre-service teachers with relatively higher ratio of positive to negative interactions would report higher self-efficacy scores. In accordance with past research on praise and positive interactions, it is also my assumption that pre-service teachers at the pre-test will display lower rates of positive to negative interactions than post-test.

2.10 Researcher Positionality Statement

The author of this work is a Black woman with prior experiences as a teacher within inclusive urban classroom spaces. Her post-secondary education and experiences as a Black woman growing up in an urban, low-income community informed her research interests, teaching practices and dedication to social justice and equity. As a student and a classroom teacher, she learned how the educational system participated in the reproduction or perpetuation of social inequality. In particular, during her experiences in schools with disproportionate rates of Black and Brown students identified for special education, she learned how a genuine display of love and care for students helped to establish a positive classroom environment that allowed students, and in particular students with perceived challenging behaviors, to thrive socially and academically. Given these prior experiences, the researcher wanted to know more about forming

positive classroom environments and the implications of culturally-responsive sustaining practices and teacher-student interactions.

3.0 Methods

3.1 Participants and Settings

3.1.1 Participants

The University Institutional Review Board (IRB) approval and informed consent for participation was collected from each participant (see appendix). Eight pre-service special education teachers attending a large northeastern university further referred to as preservice teachers throughout this study participated in the study. Pre-service teachers were recruited from two special education teacher certification programs at the university. Upon completion of one of the programs (Program A) participants obtain a Bachelor of Science in Applied Developmental Psychology and a Master of Education in Instruction and Learning. While pursuing licensure preservice teachers complete two semesters of practicum experience in PreK and life skills classrooms and two semesters of student teaching experience in elementary and high incidence classrooms. Participants in the other program (Program B), Master of Special Education, were recently enrolled for four terms and obtained teaching certifications for PK-12th and a secondary content area during the same semester that recruitment for the study began. Program B required participants to complete a one semester practicum in a content area with low incidence disabilities placement and another semester in a content area with high incidence disabilities. At the end of each of the two programs, preservice teachers acquire a PK-12 Instructional I certificate.

Convenience sampling was used to recruit participants because it allowed for the selection of information-rich cases and participants that were willing to be studied given the time

commitment and participant requirements. The principal investigator sent a recruitment email and flyer to faculty within the school of education who advised pre-service teachers within the two programs aforementioned. Faculty distributed the email to incoming, current, or recently graduated pre-service teachers who were studying special education. After participants expressed interest via email to the principal investigator, participants received an onboarding video that explained the study in more detail, and consent to participate was obtained via Qualtrics. Each participant received a unique identification number and then the numbers were randomly selected to assign participants to either the control or intervention group.

Table 1. Pre-Service Teacher Participant Demographics

Teacher	Age	Gender	Race	Home Language	Teaching Experience	Highest Level Education	Major
Lilly	20	Female	White	English	0	Some college	Applied Developmental Psychology *Program A*
Jasmine	20	Female	White	English	0	Some college	Applied Developmental Psychology *Program A*
Rachel	21	Female	Hispanic /Latino	Spanish	0	Some college	Applied Developmental Psychology *Program A*
Erin	21	Female	White	English	0	Some College	Applied Developmental Psychology *Program A*
Laketon	23	Non binary	White	Russian	1	Master's Degree	Social Studies, PK-12 Special Education-*Program B*
Susan	21	Female	White	English	0	Some College	Applied Developmental Psychology *Program A*
April	25	Female	White	English	4	Master's Degree	Music Education, Early Childhood Education and PK-12 Special Education *Program B*
Eva	21	Female	White	English	0	Some College	Applied Developmental Psychology *Program A*

Demographic information for each pre-service teacher, including their race, highest level of education obtained, age, gender, teaching experience, and classroom management experience is found in Table 1. The age of participants ranged from 20 to 25 and the average age for participants in this study was 21.5 years old. 75% of the participants identified English as their home language and 25% identified a language other than English such as Spanish (n=1) or Russian (n=1).

Participants in the randomized control group consisted of 100% female pre-service teachers (n=4) who were enrolled in Program A. 75% of the participants in the control group identified as being white (n=3) and 25% identified as Hispanic/Latino (n=1). None of the participants in the control group identified as having any prior teaching experience including student teaching experience prior to participation in this study. One pre-service teacher in the control group reported no prior training in classroom management. Two pre-service teachers in the control group reported completing two prior classroom management trainings or courses and one pre-service teacher reported that she has taken many classroom management trainings or courses. As it pertains to culturally responsive training or course completion, two pre-service teachers reported no prior training, one pre-service teacher reported completing one training and another reported "many".

Participants in the experimental group (n=4) consisted of 75% female and 25% nonbinary. Each of the pre-service teachers in the experimental group identified as being white. Two participants in this group recently completed Program B with specialties in music education and social studies. Two participants in the experimental group were also enrolled in Program B. Full-time teaching experience including student teaching experience ranged from 0 to 4 years in the experimental group. The range of previous classroom management training, courses, or professional development completed by the experimental group was between 1 and 10. Two

preservice teachers reported participating in one course, one reported participating in approximately 5, and another reported approximately 10. Additionally, the range of previous culturally responsive training or courses ranged from 1 to 10. Two preservice teachers reported participating in two courses/trainings, one reported participating in approximately three, and another reported approximately 10.

3.1.2 Setting

Mixed Reality Classroom. The SIMPACT mixed reality synchronous classroom served as the setting and learning environment for this study. The human looped system used an interactor who was responsible for controlling the movement and responses of the avatar students. The student avatars are controlled from a remote location by an interactor. The interactor is able to view the pre-service teacher and engage with the avatars in the mixed reality classroom through the use of Zoom. Therefore, pre-service teachers were able to access the SIMPACT platform from their own remote workspace. The mixed reality classroom consisted of a group of five upper elementary avatar students (see Figure 2). Other aspects of the intervention (i.e., training and feedback) were also delivered remotely.

Figure 2 Mixed Reality Classroom Photo

3.2 Materials

Instructional materials for the intervention group consisted of voice over PowerPoints. PowerPoints were adapted from previous training materials and books (Milner et al., 2019; Mrachko et al., 2017). Power points and supporting materials such as lesson plan templates were individually stored in a One Drive folder per participant (see Appendix E). In addition to instructional materials for the didactic portion of the intervention, participants used their laptop/computer and a camera to access the mixed reality practice session and training materials. SIMPACT was purchased using Urban Special Education Scholar dissertation funds and made accessible via Zoom to provide a synchronous mixed reality learning environment (see appendix B).

3.3 Dependent Variables

Observation data was collected from the recorded SIMPACT simulation sessions during pre and post-test. For the analysis of this study, the classroom management skill/s targeted is verbal interactions. The frequency of each positive verbal interactions and negative verbal interactions was noted. In addition, data regarding teachers perceived ability to implement culturally responsive classroom management strategies was also collected. Adopted from previous literature on positive/negative communication teaching behaviors (Mrachko et al., 2017), operational definitions of the observable dependent variables are found below.

3.3.1 Positive Verbal Interactions

A positive verbal interaction is defined as an exchange between a teacher and student(s) that consist of all of the following positive verbal teacher communication behaviors: behavior specific praise and general praise (Mrachko et al., 2017). In addition to positive teacher interactions involve the act of expressing praise, positive interactions also include the expression of admiration, encouragement or approval in response to student behavior. Behavior specific praise refers to any verbal statement that indicates approval and names the behavior. An example of behavior specific praise includes a statement such as, "You did a wonderful job lowering your voices after my quiet signal was given." A general praise statement refers to any verbal statement that indicates approval but does not name a specific behavior. Examples of general praise statements includes "Excellent work," or "Good job."

Literature on culturally responsiveness has also indicated that to create a positive climate verbal interaction, "appreciate, builds upon and affirms cultural identities" through applications of

empathy and perspective taking (Gay, 2010; Warren, 2013). For example, perspective taking may include interactions that demonstrate knowledge of the community or current world context, using the theme of family to communicate behavioral expectations or using aspects of the student's home language. Ultimately, the goal of perspective taking is the act of understanding a situation from an alternative point of view. For example, a teacher may emphasize that all opinions are welcomed or respected, or ask open ended questions to seek understanding. Empathetic interactions display an understanding and/or sharing of another's positive emotions or negative emotional state. For example, statements beginning with "I understand", or "I'm sorry". These all represent different forms of positive interactions for the purpose of this study and will be analyzed quantitatively and qualitatively.

3.3.2 Negative Verbal Interactions

A negative interaction is defined as a rule reminder, disapproval, or negative statements (e.g., "Stop that", "No quit!") about a student's abilities and efforts or other punitive interactions (e.g., pointing at the door to leave the room; Mrachko et al., 2017). Negative teacher behaviors and interactions also include coercive statements (e.g., lecture/logic, criticism, yelling, arguing) such as, "If you don't stop, then I will move your seat" and other argumentative or sarcastic interactions.

3.3.3 Culturally Responsive Classroom Management Self Efficacy Survey

Pre-service teacher's perceived abilities to implement culturally responsive classroom management strategies was measured by the use of Siwatu et al. (2015) *Culturally Responsive*

Classroom Management Self Efficacy Scale (CRCMSE Scale). Participants received the CRCMSE Scale before starting the study and at the conclusion of the study. The self-efficacy measure is grounded in social cognitive theory which contends that pre-service teachers have the ability to use their personal agency to manage a classroom of culturally and linguistically diverse learners or if they don't have the skills, they have the ability to find someone who does. However, these two forms of agency depend on the pre-service teachers' perceptions of their own ability (Bandura, 1977). The CRCMSE Scale served as a useful tool to gather information about preservice teachers' self-efficacy to perform classroom management tasks that are associated with culturally responsiveness. The scale was comprised of 35 items that required participants to rate how confident they were on a scale of 0 (not confident at all) to 100 (very confident) in their ability to perform various culturally responsive classroom management tasks. Examples of items on the CRCMSE scale include, "clearly communicate classroom policies" or "manage situations in which students are defiant". Pre-service teachers with higher scores are considered to be more confident in their abilities to engage in culturally responsive classroom management practices (see Appendix C). The initial Cronbach's alpha of the CRCMSE scale is a= .97, demonstrating a relatively high internal consistency (Siwatu et al., 2015).

3.4 Independent Variable

The primary independent variable for this study was didactic instruction on positive/negative interactions with a culturally responsive classroom management framework. In addition, performance feedback was provided through email to pre-service teachers in the

intervention group. Pre-service teachers in the control group did not receive any of the intervention components (i.e., training or performance feedback).

3.4.1 Didactic instruction

Pre-service teachers receive training through three 20-minute narrated instructional PowerPoints on the following skills: positive interactions, negative interactions, and culturally responsive classroom management. Components of these three trainings were taken from the text *These Kids Are Out of Control: Why We Must Reimagine Classroom Management for Equity,* previous research on positive/negative interactions (Mrachko et al., 2019), and interactive materials from the IRIS modules classroom management and culturally responsive series.

Training 1: Introduction to Culturally Responsive Classroom Management and Rapport Building. This first Powerpoint set the premise that when discussing culturally responsive classroom management a shift in thinking must occur from how do I change a child's behavior to what is it about my own behavior or beliefs that needs modified to better form a positive classroom environment. Moreover, this training emphasized how teachers can develop caring classrooms and build strong rapport with students using the 'stay close' strategy. The training emphasized that when teachers 'stay close' or 'study their students' (Ladson-Billings, 2009) then they are able to draw on the cultural assets of students, families, and communities which can be used to build rapport and make classroom management moves.

Training 2: Positive Framing/Communicating in Culturally Consistent Ways. The second Powerpoint discussed the use of culturally and ethnically congruent communication processes to engage in positive interactions with students. During this training pre-service teachers were directed to the IRIS module to complete a linguistic diversity activity and listen to experts in the

field (Dr. Alfredo Artiles and Dr. Donna Ford) discuss how to value different storytelling and interactive communicative styles. For example, one part of the activity explored how a student who repeatedly interrupts a teacher in the classroom could be culturally acceptable and how to avoid reacting negatively to this style. Furthermore, strategies regarding providing behavior specific praise and avoiding junk behavior were provided in this training. There was a strong emphasis throughout the training on the importance of teachers using a positive framing to help students see and feel that they belong in the classroom.

Training 3: Avoiding Coercion/Recognizing Ethnocentrism. The third Powerpoint described coercion traps (arguments, force, sarcasm, pleading, etc.) that teachers get caught in and how to avoid those traps. There was also a discussion about teacher beliefs, bias and self-awareness and how sometimes, as humans we often act and react from our implicit bias. Pre-service teachers were prompted to engage in questions that enabled them to examine their own implicit biases to gain a deeper interpersonal aspect of classroom culture. For example, pre-service teachers were directed to complete the Harvard Implicit Bias activity.

In the notes section of each training PowerPoint, pre-service teachers were prompted to engage with and respond to one to two overarching reflection questions to check for understanding of skills and concepts. To determine if the training was accessed by participants, viewing time and the participant's notes were reviewed by the principal investigator and a follow-up email was provided if pre-service teachers did not access the materials.

3.4.2 Performance Feedback Emails

The four pre-service teachers in the intervention group received performance feedback emails following their mixed reality session. The performance feedback email included the number

of positive and negative interactions completed within the observed time frame. The email also included examples that the pre-service teacher used of positives and negatives. There was also a section within the email providing some feedback or thought-provoking questions regarding cultural responsiveness. The email also included areas of success and areas of growth for the pre-service teacher to display in the next session.

3.5 Procedures

3.5.1 Onboarding

Consent letters were received from each participant. Preservice teacher participants were provided a handout with some brief context and background information on the study. At the initial onset of onboarding, ten consent letters were received, however during the onboarding process, two participants withdrew because they could not commit to the mixed reality sessions. Once signed consent was received, participants were randomly assigned to either the control or experimental group. Each participant was assigned a unique number and the number was pulled from a hat to assign preservice teachers to the intervention or control group. The principal investigator provided a ten-minute onboarding video to discuss the following: a review of the study, a review of expectations of participants regarding completion of intervention training, and confidentiality with regards to the study. Participants emailed any questions that resulted from watching the video to the principal investigator who provided clarification. After informed consent was received, each participant signed up for two 15-minute mixed reality sessions. Pre-service

teachers were provided a morning meeting lesson plan template within their personal One Drive folder to help with the preparation and planning for their mixed reality session.

3.5.2 Pre-test

Pre-service teachers completed the CRCMSE Scale through Qualtrics as a pre-test measure. Additionally, during the pre-test session, pre-service teachers taught a short fifteen-minute morning meeting lesson within the SIMPACT mixed reality classroom. During the pre-test SIMPACT session, preservice teachers implemented a morning meeting/classroom meeting lesson that included the following elements: greeting, rules/expectations review, sharing session, activity, and morning message. Preservice teachers had the autonomy to design the details of their own lesson within the structure of a morning meeting lesson. This was done to resemble the variability that would occur in a typical school environment, where teachers are responsible for their lesson planning. Each pre-test session was video recorded for future review and coding.

3.5.3 Implementation of Intervention

After pre-test items were completed the researcher uploaded training materials for the intervention group. Training materials were uploaded to each individual preservice teacher's One Drive folder. The One Drive folder provided the intervention group with access to the three prerecorded 20-minute sessions on positive interactions, negative interactions, and what it means to apply culturally responsive classroom management practices when interacting with students to increase positive interactions. Participants viewed the pre-recorded training and completed checking for understanding questions about the training materials over the course. Materials

remained available to the intervention group for the entire study. Mixed reality sessions were recorded so that the principal investigator could review and provide feedback to the pre-service teachers. Pre-service teachers in the control group did not receive the didactic instruction or feedback after the pre-session.

3.5.4 Post-test

Upon completion of the didactic training participants in the intervention group and participants in the control group were scheduled to complete their post-15-minute mixed reality session on zoom. Depending on which of the available mixed reality sessions fit the pre-service teacher's availability the time span between pre-test and post-test varied for each participant. The procedures in the post-test session were the same as the procedures in the pre-test session. All pre-service teachers completed the CRCMSE Scale a second time after participating in the SIMPACT session. Training materials were distributed to pre-service teachers in the control group after the post-test CRCMSE was completed.

3.6 Experimental Design and Data Analysis

This study employed a pre-test-post-test randomized control group design to examine the effects of a CRCM training package on self-efficacy and teacher interactions. To enhance the internal validity of this study, the researcher randomly assigned preservice teachers to either the control or intervention group. Using the list of participants, each participant was assigned a unique identifying number. A random number generator was used to place each preservice teacher in one

of the two groups (i.e., intervention or control). Preservice teachers in the intervention group received the culturally responsive classroom management intervention package whereas those in the control group did not until after the study was completed. Pre-test and post-test observations were coded to analyze within and across group comparisons. Descriptive statistics and an independent and paired t-test were used to analyze the data quantitatively while qualitative coding methods were used to dive deeper into teacher interactions.

3.6.1 Descriptive Statistics

The mean and standard deviation for pre-test and post-test averages for observed positive and negative interactions were reported for both the intervention and control group. Using descriptive statistics, a plot was also created for the control and intervention group. The plot allows for a comparison in the scores of the intervention and control group between the testing sessions.

Descriptive statistics was also calculated for the CRCMSE scale. Scores on the CRCMSE Scale were summed to generate a total-score. The range of total scores obtainable on the CRCMSE Scale is between 0 and 3,500. The total score was then divided by the total number of items to create a CRCMSE strength index. The strength index is an indicator of the strength of each preservice teacher's CRCMSE beliefs. The index value will range from 0 to 100. The higher the index value, the higher the self-efficacy of the pre-service teacher.

3.6.2 Inferential Statistics

Inferential statistics was used to test whether the observed differences in teacher-student interactions between the intervention and control group were significant or by chance. The independent group t test was used to compare means between the control and intervention group. The null hypothesis tested was: H_0: $M_c=M_i$ where M stands for the mean number of interactions (i.e., positive or negative) for the control (M_c) and intervention group (M_i). The alternative hypothesis is that the means are not equivalent. Requirements of the independent group t test include: normal distributions and equal variances between the two groups. Assumptions for performing the t-test were checked for any violations by analyzing histograms, Q-Q Plots, and tests of normality. A statistical data analysis program, SPSS was used to conduct the t-test. For significant testing, if the p-value was below .05 then the conclusion was made that there is a statistically significant difference between the two group means.

3.6.3 Qualitative Analysis of Positive Interactions

A combination approach of deductive coding and inductive coding was used to analyze the positive interactions displayed by pre-service teachers during the mixed reality sessions. The coding process started by developing a codebook with the initial predetermined set of codes. The initial set of codes were taken from the training materials and included the different types of praise statements that pre-service teachers could use in their classroom. These three initial codes were: general praise, behavior specific praise and other. During the first round of coding, the data was analyzed by viewing the video recordings and excerpts were assigned to the three codes within the codebook. As the data was sifted through in the next round, new codes were developed from the

data for the "other" category to gain a deeper understanding of what other positive interactions pre-service teachers were engaging in that may not be captured as praise. Then, during the next round, codes were grouped together to form subcategories to the other pre-determined codes.

3.7 Reliability of Dependent Measures

To monitor and assess the human errors that may occur within the measurement process, a secondary trained observer was used. The secondary trained observer was a certified Applied Behavior Analyst and a special education doctoral candidate. To collect interobserver agreement (IOA), the secondary observer was trained by the principal investigator on the behavioral codes and measurement system. During this initial training the secondary coder was provided a pre-recorded Powerpoint that described the study, the observational procedures and measurement system. After the secondary coder watched the Powerpoint the principal investigator and the secondary coder met via Zoom to review any questions. Additionally, during this meeting the principal investigator and the secondary observer reviewed dependent variable definitions, observational recording sheets, and used sample video footage to practice coding and discussing participants' verbal interactions collaboratively. The secondary coder independently scored a total of 5 (31.25%) randomly selected mixed reality sessions. IOA was collected and calculated on 37.5% of pre-test observations, 25% post-test observations, and 25% of control group observations, 37.5% intervention group observations. If there were any discrepancies regarding consistency across observers then sessions were re-watched and discussion occurred between the researcher and secondary observer around questions or concerns regarding whether the dependent variable occurred or did not occur.

A percent agreement approach to IOA was calculated for each session using the frequency of positive interactions and negative interactions across each minute of data collection. To calculate percent agreement IOA, the following formula was used *agreements/agreement+disagreements ×100*. For example, if the secondary coder identified 44 positives and 4 negatives while the principal investigator coded 47 positives and 5 negatives, IOA was calculated by taking the total agreements (48) and dividing by the agreements plus the disagreements (48+4) resulting in .92 or 92%. Each session coded for IOA reached 80% or above. The range for IOA was 82% to 100% for the five sessions coded for IOA.

3.8 Treatment Integrity

All training materials were pre-recorded and made available to participants. The pre-recording of the pieces of training ensured that the delivery of the training materials was the same for each participant. A checklist was used by the principal investigator prior to and after the mixed reality practice sessions to determine the extent to which the session and follow-up was being administered as planned. The treatment integrity score represents the accuracy of implemented intervention components. The mixed reality sessions were conducted as planned (100%), the training materials included all necessary components (100%), and each of the performance feedback emails included all required elements as outlined in the template (100%).

3.9 Social Validity Measure

At the conclusion of the study, participants of this study completed a questionnaire of ten questions with likert scale questions and open-ended questions. Pre-service teachers answered questions pertaining to the value, perceived acceptability and usefulness of the intervention to their classroom management abilities. For example, "To what extent do you think the intervention will impact your interactions with students now that the study is over?", "How do you feel your skills in applying culturally responsive practices to the classroom management strategy of positive interactions changed?" The quantitative rating scale portion of the social validity measure was analyzed using descriptive statistics. The open-ended questions of the social validity questionnaire were analyzed using thematic coding procedures.

4.0 Results

The purpose of this study was to assess the effectiveness of a culturally responsive classroom management training on preservice teachers' positive and negative teacher interactions and culturally responsive classroom management self-efficacy scores. As discussed in Chapter 3, this research study employed a pre-test post-test randomized control group design. Pre-service teachers in both the intervention and control group took a pre-test to measure their baseline level of culturally responsive classroom management self-efficacy scores and positive/negative interactions. After the one-hour intervention, pre-service teachers in both groups took an identical post-test and the results were analyzed using SPSS 15. The principal investigator used SPSS 15 to calculate the descriptive statistics (mean, range, standard deviation) for pre-service teacher behaviors. To assess for statistically significant differences between and within groups independent and paired t-tests were conducted.

The results of the analysis are organized into five sections. The first section focuses on the frequency and ratio of pre-service teachers' positive and negative scores during the pre-test and post-test mixed reality sessions (RQ1). As a follow-up to the quantitative data presented in the first section, this section will also present a discussion of the qualitative analysis of teachers' positive and negative vocal statements. The second section focuses on the CRCMSE Survey results from the pre-test and post-test (RQ2). The third section provides pre-service teachers' social validity survey results (RQ4).

4.1 Quantitative Analysis of Positive and Negative Verbal Interactions

4.1.1 Pre-test Positive and Negative Interactions

All eight preservice teachers participated in a baseline mixed reality session. Table 2 shows pre-test descriptive statistics scores of positive and negative interactions for each pre-service teacher. Prior to running any t-test on the data, a test of normality using the Shapiro Wilk test (p>.05) and an examination of Normal Quantile-Quantile plots were done for each measure. Based on the tests of normality, it can be assumed that the data fits the assumption of normality. The assumption of homogeneity was also tested using Levene's Test (p>.05) which indicated that the assumption of homogeneity was met. In the control group, pre-service teachers scored between 20 and 23 positive verbal interactions with an average score of 22.5 positive verbal interactions. Negative interactions for the control group during the pre-test ranged from 3 to 6 with a mean of 4.25. In the intervention group, teachers scored between 14 and 44 positive verbal interactions with a mean score of 29. Negative interactions for the intervention group during the pre-test ranged from 4 to 5 with a mean of 4.75.

Table 2 Pre-Test PVI and NVI Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Positive Verbal Interactions Pre-test	Control	4	22.50	1.732	.866
	Intervention	4	29.00	12.490	6.245
Negative Verbal Interactions Pre-test	Control	4	4.25	1.500	.750
	Intervention	4	4.75	.500	.250

The null hypothesis tested when running an independent sample two-tailed t-test indicated that there is not a significant difference between the control and intervention group pre-test frequency scores of positive and negative interactions. Given the results of the independent samples t-test for PVI (t=-1.03, $p >$.05) and NVI (t=-.632, $p >$.05) not being statistically significant we fail to reject the null hypothesis and assume that there is not a significant difference between the control and intervention group pre-test scores.

In addition, when examining the ratios of PN interactions, at pre-test the average ratio for the control group was 5.3:1 and the average ratio for the intervention group was 6:1 (Table 3). This means that the intervention group had a slightly higher ratio at pre-test then the control group, but otherwise relatively close PN ratios.

Table 3. Individual Participant Pos/Neg Scores and Ratios

Participant	Pre-test +	Pre-test -	Ratio	Post-test +	Post-test -	Ratio
Control Group						
Lilly	20	5	4:1	31	7	4.4:1
Jasmine	24	6	4:1	34	8	4.2:1
Rachel	23	3	7.6:1	23	8	2.9:1
Erin	23	3	7.6:1	27	6	4.5:1
Mean	22.5	4.25	5.3:1	28.75	7.25	3.9:1
Intervention Group						
Laketon	32	5	6.4:1	50	8	1.3:1
Susan	14	5	2.8:1	33	1	33:1
April	44	4	11:1	57	5	11.4:1

Eva	26	5	5.2:1	39	3	13:1
Mean	29	4.75	6:1	44.75	4.25	10.5:1

4.1.2 Post-test Positive and Negative Interactions

Table 4 presents post-test descriptive statistics scores for pre-service teachers' positive and negative interactions. Normality and homogeneity assumptions were tested using the same procedures listed above with pre-test data. There were no violations of assumptions for the post-test data scores. The control group ranged from a minimum of 23 to a maximum of 34 PVI with a mean of 29. Negative verbal interactions ranged from a minimum of 6 to a maximum of 8 NVI with a mean of 7 at post-test. The intervention group ranged from 30 to 57 PVI with a mean of 44.75 and a minimum of 1 to a maximum of 8 NVI at post-test with a mean of 4. An independent sample two tailed t-test ran on the post-test counts showed that there was a statistically significant difference for PVI between the intervention and control group ($t= -2.71$, $p<.05$). The NVI did not show a statistically significant difference ($t = 1.91$, $p>.05$). In addition, when examining the ratios of PN interactions, at post-test the average ratio for the control group was 3.9:1 and the average ratio for the intervention group was 10.5:1 (Table 3). This means that the intervention group at post-test had a higher PN interaction ratio.

Table 4. Post-test Descriptive Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Positive Verbal Interactions Post-test	Control	4	28.75	4.79	2.39
	Intervention	4	44.75	10.78	5.39
Negative Verbal Interactions Post-test	Control	4	7.25	.96	.48
	Intervention	4	4.25	2.99	1.49

4.1.3 Group Comparisons

The control groups average PN ratio decreased by 1.4:1. In comparison, the intervention groups PN ratio increased by 4.5:1 (see Table 3). To assess the overall effects of the intervention a paired t-test was conducted. Since the pre-service teachers in this study are observed twice (pre and post-test) a paired t-test is helpful in examining mean differences. For this test, the mean difference between pre-test and post-test frequency scores for the intervention group and the mean difference between pre-test and post-test scores for the control group are observed and compared to determine if there is statistical evidence that the mean difference is significantly different from zero (H_0: μ_1 - $\mu_2 = 0$). In general, for all pre-service teachers, the paired t-test concluded that there is a significant difference between pre-test and post-test scores for PVI (t=-4.8, p<.05). There was not a significant difference between pre-test and post-test scores for NVI (t = -1.2, p>.05).

With regards to the control group, in particular, there is no statistical evidence that the mean difference between pre-test (M=22.5) and post-test (M=28.75) positive verbal interactions is significantly different from zero (t = -2.41, p >.05). However, there is statistical evidence that the mean difference between pre-test (4.25) and post-test (7.25) negative verbal interactions is significantly different from zero (t = -4.24, p <.05). With regards to the intervention group, there is statistical evidence that the mean difference between pre-test (M=29) and post-test (M=44.75) positive verbal interactions is significantly different from zero (t = -9.84, p <.01). On the contrary, there is not statistical evidence that the mean difference between pre-test (4.75) and post-test (4.25) negative verbal interactions is significantly different from zero (t = .32, p >.05). Figure 2 and Figure 3 display a bar graph comparing the pre and post test scores for positive and negative verbal interactions.
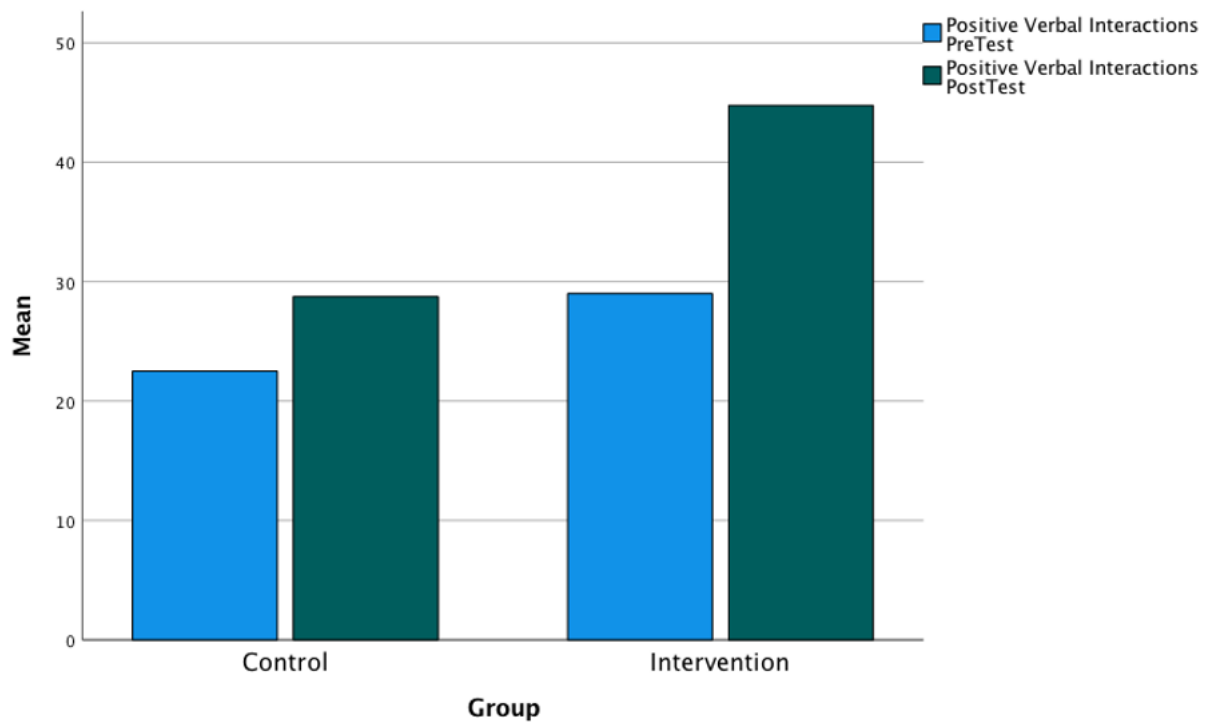
Figure 3 Positive Verbal Interactions Pre and Post
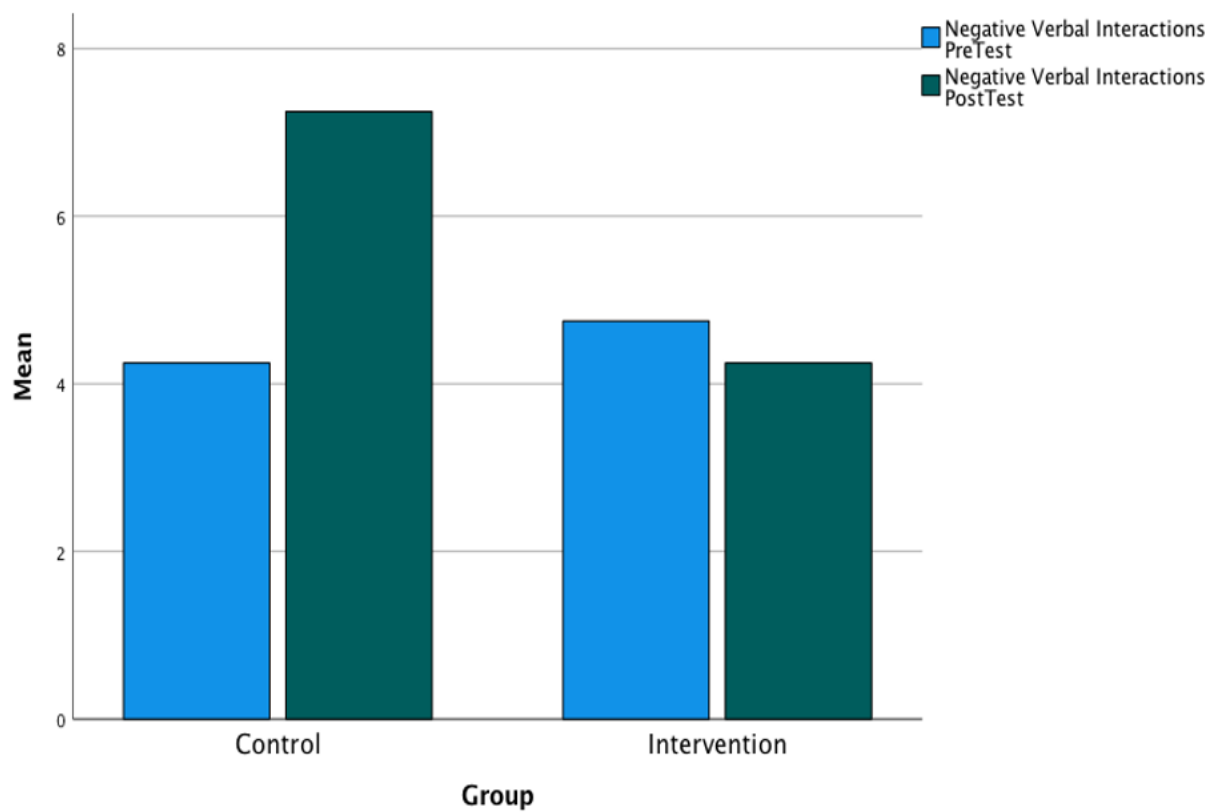
Figure 4 Negative Verbal Interactions Pre and Post

4.2 Qualitative Analysis of Positive and Negative Interactions

The quantitative data derived more positive interactions across each pre-service teacher. In addition, there were a lot of teacher moves made during the mixed reality sessions that were positive, but didn't necessarily fall within the definition of general or specific praise. It was within these "other" positive interaction moments that pre-service teachers displayed relationship-building moves that are essential to culturally responsive classroom management, warranting a more in-depth analysis of those interactions. A qualitative analysis of pre-service teachers' positive interactions in response to student behavior was conducted.

4.2.1 General Praise

General praise statements were identified as fitting within two subcategories: one word used to acknowledge approval, expression of surprise, joy or amazement, or statements that vaguely praise without specifically stating the behavior. Table 5 provides illustrative quotes from the data. For example, general praise using one word for acknowledgement, approval, joy or amazement included words such as "Nice!" or "Wow". When these types of praise statements were given pre-service teacher's, voice changed in pitch and facial expressions also changed. General praise statements that praise without specifically mentioning the behavior included, "That's awesome." or "Very good."

4.2.2 Behavior Specific Praise

Behavior specific praise statements specifically identified the student or the class and behavior paired with a term of praise. For example, "I like that you added some plot and another character to our story" and "Thank you for raising your hand." Pre-service teachers tended to use behavior specific

62

praise statements when pivoting or towards the entire class when all students were engaging in the desired behavior.

4.2.3 Other Positive Statements

Subcategories that emerged from the "other" positive statements included: empathetic statements beginning with I, positive references to student's personalities, skills or character traits, encouragement to make mistakes, validation or affirmation of student's statements or feelings, validation or affirmation of student's statements or feelings with personal connection made, affirmation of student's family perspectives, and acquiring additional information about students through open ended questions. Each of these subcategories were essential to relationship building and perspective taking. See Table 5 for illustrative quotes.

Table 5 Themes and Quotes from Analysis of Teacher Positive Interactions

Theme	Context Examples	Illustrative Quotes Examples
	General Praise	
One word to acknowledge approval, expression of surprise, joy or amazement.	•After volunteering to participate or after answering a question prompted by the teacher • When each student is expected to share out and the teacher uses this praise to transition to the next student	•Nice! •Excellent! •Yep •Great •Wow! •Oooo! •Awesome
Statements that praise without specifically stating the behavior	•When a student makes a contribution to the group discussion.	•That's perfect. •Thank you. •I love that. •That's awesome. •That's a good idea. •I like that word. •Very good
	Behavior Specific Praise	

Specifically identifies the student or class and student behavior paired with a term of praise	• Used when the pre-service teacher is attempting to pivot from unwanted behavior occurring in the classroom •Used when the entire class is displaying behaviors that were requested from the pre-service teacher • Used when a student provides a response that is more novel or varies from other students	•Thank you to the rest of the classmates for listening so nicely. I can tell you we're all interested in what he was saying. •I like that you're trying to remember and taking initiative. •Thank you for sharing. •That's a great job. I like that you added some plot and another character to our story. •Thank you for elaborating on that Carlos.
Other Positive Interactions		
Empathetic statements beginning with I	•When a student expresses disinterest in a class or activity	•I'm sorry you feel like that Will. •I'm sorry. •I understand. You're right that is not good. •I want your day to get better. •I hope this helps you Will or anyone not feeling good. I'm going to play relaxing music and we are going to work on breathing.
Positive references to student's personalities, skills or character traits	•In response to students expressing doubt •In response to students identifying positive characteristics about themselves •In response to a discussion about classroom norms and assuming best intentions	•You are very joyful. •I think you're magical. •I'm sure that you will be successful. It sounds like you're working really hard and very knowledgeable. •Together we complement each other. I think you're all wanting to be successful in this class.
Encouragement to make mistakes	•A student in the class reprimands another student for not following the classroom rules •A student in the class voices frustration aloud with the writing activity because they keep making mistakes	•That's okay, we can help each other. •It is imperfect and sometimes we do make mistakes and we can recover from those too. It's okay. •We are always learning and always working on our mistakes, but it's okay that we make mistakes. •It's okay if it's not perfect.
Validation or affirmation of student's statements or feelings	• In response to students sharing out their interests or feelings pertaining to	•That sounds like a { } experience. •You're right. •You're right. It is hard and it can be frustrating or scary.

	events that happened outside of the school •In response to students voicing concerns regarding traumatic experiences such as school violence	•That sounds like a really fun activity. •You're right, the world is very chaotic right now and it's normal to feel confused or overwhelmed.
Validation or affirmation of student's statements or feelings with personal connection made.	• In response to students sharing out their interests or feelings regarding family activities or even conflicts	•That sounds so fun. I love swimming. •Change can be kind of hard when you don't like something like that. I'm the same way.
Affirmation of student's family perspectives	•When students express comments such as "My mom said…" or "My dad said"	•I'm glad that your dad is teaching you how to advocate for yourself and say when you do and don't want to be touched, that's very important. •Your moms are both right that having other people over to support you is a great way to be a friend.
Acquiring additional information about students through open ended questions	•Student shares out to the class something that they are proud of and excited about. •Student shares out to the class their feelings of discontent, sadness frustration	•Do you have any questions that you would like to ask Carlos about it, it seems like you're also interested in his robot? •Why didn't you have a good morning? Would you like to share?

4.3 Culturally Responsive Classroom Management Self Efficacy (CRCMSE) Scores

To measure pre-service teachers 'change in culturally responsive classroom management self-efficacy before and after participation in the online training the CRCMSE measure was used. Data were analyzed through descriptive statistics and by employing t-tests to determine if there was a significant difference in teacher efficacy mean scores over time.

4.3.1 Pre-test

Table 6 display the descriptive statistics for the CRCMSE pre-test. During pre-test, the range of CRCMSE scores ranged from 42 to 83.86 with a mean of approximately 63.33 for the control group and 61.45 for the intervention group. An independent t-test was conducted to determine if there was a statistically significant difference in the pre-test scores for the control and intervention group. The results of the t-test indicate that there is not a statistically significant difference between the pre-test scores of the control and intervention group (t=.175, p>.05).

Table 6 Pre-test Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pre	Control	4	63.33	7.43	3.71
	Intervention	4	61.45	20.18	10.08

4.3.2 Post-test

Table 7 displays the descriptive statistics for the post-test. During post-test the range of CRCMSE scores ranged from 53.29 to 89 with mean of 64.61 for the control group and 74.14 for the intervention group. An independent t-test was conducted to determine if there was a statistically significant difference in the post-test scores for the control and intervention group. Based on the results of the t-test, there is not a statistically significant difference between the post-test scores of the control and the intervention group (t = -1.01, p >.05).

Table 7 Post-test Group CRCMSE Descriptive Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Post	Control	4	64.61	13.39	6.7
	Intervention	4	74.14	13.15	6.58

4.3.3 Group Comparison

A paired sample t-test was conducted to generally compare all of the pre-test scores to the post-test scores. The mean post-test scores in general were higher (*M*=69.37) than the pre-test score (*M*=62.39) representing a mean difference of 6.98. The mean difference was not statistically significant (*t*=-2.01, *p*>.05). Cohens D was calculated to identify the effect size, the difference between the two sample means of pre and post-tests is .70, indicating a medium effective size.

For the control group in particular, the mean difference (1.28) from pre-test (*M*=63.32) to post-test (*M*=64.61) was not statistically significant (t = -.28, p>.05). Effect size for the control group was .14 indicating a small effect. For the intervention group, the mean difference (12.69) from pre-test (*M*=61.45) to post-test (*M*=74.14) was statistically significant (t = 3.4, p<.05). Effect size for the intervention group was 1.70 indicating a very large effect size. Overall, self-efficacy scores from the intervention group improved from the pre-test condition demonstrating a strong relationship between higher pre-service teacher self-efficacy and participation in the intervention (see Table 8). The intervention group also had a higher mean difference between pre-test and post-test self-efficacy scores in comparison to the control group.

4.3.4 CRCMSE Individual Item Analysis

An analysis of each item on the CRCMSE survey pre and post-test was examined to see if any change happened on particular question items. At pre-test high scored items across the control group included items related to modifying lesson plans so that students remain actively engaged ($M=84.75$), address inappropriate behavior without relying on traditional methods of discipline ($M=83.25$), redirect student's behavior without the use of coercive means ($M= 82.75$), and communicate with students using expressions that are familiar to them ($M= 82.5$). At post-test high scored items across the control group included: clearly communicate classroom policies ($M=77.25$), redirect students' behavior with the use of coercive means ($M=76.5$), and structure the learning environment so that all students feel like a valued member of the learning community ($M= 75.75$).

At pre-test high scored items across the intervention group included: redirect student's behavior without the use of coercive means ($M=79.63$), modifying lesson plans so that students remain actively engaged ($M=77.75$), critically assess whether a behavior constitutes misbehavior ($M=77.38$), and structure the learning environment so that all students feel like a valued member of the learning community ($M=76$). The highest scored items at post-test for the intervention group included modify lesson plans to actively engage students ($M= 84.75$), address inappropriate behavior without relying on traditional methods ($M=83.25$), and redirect students' behavior without the use of coercive means ($M=82.75$).

Table 8 CRCM Self Efficacy Individual Mean Scores

	Participant	Pre-test	Post-test
Control	Lilly	55.68	60.57
	Jasmine	71.4	84.03
	Rachel	58.54	53.29
	Erin	67.69	60.54
Intervention	Laketon	47	62.29
	Susan	42	63.89
	April	83.86	89
	Eva	72.94	81.37

4.4 Social Validity Analysis

Social validity was assessed at the conclusion of the study. A brief survey with ten questions was provided to pre-service teachers in the control and experimental group after they completed the post-test. The first six questions on the survey provided statements and pre-service teachers had to identify the extent to which they agreed or found the study component mentioned in the statement useful ranging from: strongly disagree/not useful, slightly disagree/somewhat not useful, slightly agree/somewhat useful, strongly agree/very useful, and not applicable (see Table

9). Overall, 100% of the preservice teachers who participated in the study found the mixed reality sessions to be very useful for practicing teaching and classroom management. In addition, 100% of the preservice teachers strongly agreed that the study was appropriate for pre-service or novice teachers.

Table 9 Social Validity Pre-Service Teacher Questionnaire Responses

	Control	Experimental
1.How would you rate the usefulness of the instructional materials (i.e., lesson planning template and training materials)?	100% Very Useful	25% Very Useful 75% Somewhat Useful
2.How would you rate the usefulness of interacting within the mixed reality classroom for practicing teaching and classroom management?	100% very useful	100% very useful
3.This study was appropriate for pre-service teachers or novice teachers.	100% strongly agree	100% strongly agree
4. To what extent would you recommend that other pre-service teachers receive and be exposed to the technology and resources used within the study?	75% strongly agree 25% slightly agree	75% strongly agree 25% slightly agree
5. I am better able to respond to student behaviors.	75% strongly agree 25% slightly disagree	50% strongly agree 50% slightly agree
6. I am better able to work with a diverse set of learners.	100% slightly agree	100% slightly agree

The remaining four questions of the social validity questionnaire were open ended and analyzed thematically. Below are themes and excerpts found from the remaining questions of the social validity questionnaire.

Question 7: Impact on Attentiveness to Positive or Negative Interactions

Preservice teachers stated participation within the study allowed them to be more attentive to students and their own actions as the educator. In particular, preservice teachers in the control group focused their responses on positive and negative student behavior. A preservice teacher in the control group explained, "I did not receive the training but it made me more aware of how students interact

positively and negatively and how it effects classroom dynamics." In addition, another pre-service teacher in the control group discussed the possibility of using interactions for teaching moments for other students in the class, and to be more assertive when there are "interruptions" or "defiance". In comparison pre-service teachers in the intervention group were reflective on their own teaching behaviors and attentiveness to their role in positive or negative interactions. A pre-service teacher in the intervention group explained, "The feedback I received indicated that I used negatives during my first session. I didn't even realize I used them, and I was much more attentive to my actions during the second session."

Question 8: Changes in Applying Culturally Responsive Practices to Classroom Management

Pre-service teachers discussed the ability to apply "certain tactics and skills" that could be used "more often" in their teaching and the classroom. A common theme that arose when discussing the application of skills and tactics was consistency and persistence even during "moments of frustration". Another theme was this idea of "real experiences". A pre-service teacher in the intervention group explained that they felt they were provided a real experience. In comparison, pre-service teachers in the control group explained that they did not feel challenged. For example, "I was hoping there would be more of a challenge with what the avatars brought in terms of diversity in their comments...I felt as though I wasn't exposed to many new scenarios compared to real life experiences in the classroom." In addition, a pre-service teacher in the control group explained they felt there was no change in their skills or knowledge without the training. One pre-service teacher in the intervention group discussed becoming more aware of how best to make students aware of the skills they bring to the classroom from their home lives.

Question 9: Likes and Dislikes of the Study

When asked what components of the study pre-service teachers liked the most the majority of the pre-service teachers mentioned the mixed reality session. Pre-service teachers described the mixed reality sessions as enjoyable, very interesting, fun, great practice, and realistic. Other components that

71

one pre-service teacher mentioned liking the most were the PowerPoints used for the didactic training. While some pre-service teachers liked the PowerPoints to "gain more knowledge" other preservice teachers suggested more interactive learning materials that were not PowerPoints. In addition, other feedback suggested being given more time in the mixed reality sessions, and being given a specific lesson to teach.

5.0 Discussion

Chapter 5 will review the problem statement and then provide a discussion of key research findings from the study related to changes in pre-service teachers positive and negative interactions and their culturally responsive self-efficacy scores. The findings will be connected back to the conceptual framework of culturally responsive (sustaining) classroom management and previous literature. Then, the implications for practice and limitations will be discussed. Lastly, chapter 5 will conclude with future directions for research.

5.1 Problem Statement Revisited

The cultural-linguistic landscape of U.S. classrooms has become more complex and diverse through the inclusion of more heterogenous student populations (Cartledge, Singh, & Gibson, 2008). However, the research on classroom management for pre-service teachers has paid very little attention to issues of cultural diversity and vice versa (Everston & Weinstein, 2006; Wubbels, 2011). Therefore, a critical need arises for pre-service teachers to be equipped with strategies during their teacher preparation to make sense of and come to understand issues of cultural diversity in their classroom management approaches. While proactive classroom management strategies are at the core of teacher effectiveness and has been found to lead to decreases in disruptive behavior (Clunies-Ross, Little, & Kienhuis 2008; Simonsen et al., 2008), poor classroom management is detrimental to student achievement, linked to less instruction, and contributes to an unproductive learning environment (Clunies-Ross et al., 2008; Cook et al., 2018).

73

In addition, within classrooms of cultural and linguistic diversity, many teachers may not have the dispositions to deliver the most appropriate classroom management approach and instead resort to the use of culturally insensitive discipline practices. Alarmingly, previous studies reported that too often teachers use reactive strategies and coerciveness in the classroom which can perpetuate problem behaviors and damage teacher-child relationships (Clunies-Ross et al., 2008; Cook et al., 2018). However, positive teacher-child relationships are vital for children and critical to promoting equity within the classroom. The American Psychological Association's Teacher Needs Survey (2006) revealed that within the broader scope of classroom management teachers wish they had more training on ensuring students are socially and emotionally safe, ensuring students participate in classroom interaction and ensuring that negative behaviors do not remain an ongoing distraction. The present study incorporates components that provide an opportunity for growth and learning in these areas during the pre-service years.

The present study explored the effect of participation in a culturally responsive classroom management training on pre-service teachers' self-efficacy scores and the change in teacher-child positive and negative interactions. This study was situated within the broader problem of disproportionality and the need to develop more positive classroom environments through development of teacher CRCM practice. In this study, a pre-test/post-test randomized control design was used to examine the effects of the training and a qualitative analysis was done to further illustrate patterns of pre-service teacher's positive interactions. In relation to the research questions, there were various key findings that resulted from the study.

5.2 Discussion of Key Findings

Research Question 1: What effect does a culturally responsive classroom management intervention package using positive interaction strategies have on pre-service special educators' frequency of positive and negative verbal interactions in a mixed reality environment? 1a. To what extent did the frequency of positive and negative verbal interactions improve for students in the intervention condition relative to students in the control condition?

Rigorous studies on teacher-child classroom interactions have indicated that children learn and develop in part as a function of their interactions with their teacher (Guo et al., 2010; Dickenson & Brady, 2006; Pianta et al., 2009). Positive teacher interactions have been found to influence student engagement, student self-perceptions, and support teacher-student relationships (Dobbs & Arnold, 2009). Based on this research, monitoring and assessing teacher-child positive and negative interactions has become a feature of many teacher evaluation measures (Downer, Sabol, & Hamre, 2010). While previous research has assessed the effectiveness of classroom management interventions with trainings on teachers positive to negative (PN) ratio, very few studies have explored positive and negative interactions with pre-service teachers and none to date have done so using a culturally responsive classroom management package.

The culturally responsive classroom management intervention package used during this study appeared to have a positive effect on pre-service teacher's frequency of positive and negative verbal interactions. Pre-service teachers who received the intervention increased their frequency of positive interactions from pre-test and post-test, and the mean difference was statistically significant. In comparison, the mean difference from pre-test to post-test on positive verbal interactions for the control group was not statistically significant. For the control group, the mean difference in negative verbal interactions from pre-test to post-test was statistically significant. There are many possible explanations based on previous research and conceptual frameworks for these findings.

Given that the intervention group received feedback and training materials that discussed ways to increase positive interactions and ways to avoid negative interactions, it is not surprising that the difference from pre-test to post-test was significant and greater than the difference for the control group. Moreover, pre-service teachers in the intervention group also achieved higher PN ratios. Empirical studies, such as Cook et al. (2017) and Pisacreta et al. (2011) trained teachers to improve their PN ratios and like this study saw increases in PN ratios.

With regards to the impact of the training on the change in PN ratios, culturally responsive classroom management scholarly work suggests that to be an effective teacher one must know how their beliefs and dispositions about classroom management impact classroom interactions so that behaviors are not misinterpreted (Weinstein et al., 2004). The training and performance feedback that the intervention group received pushed pre-service teachers to examine their own biases and assumptions about behavior to develop a positive classroom environment during their experience in the mixed reality simulations.

For example, the principal investigator provided feedback to participants regarding their positive and negative interactions from a culturally sensitive lens. Feedback included comments such as: what is it about your own communication style in comparison to the student's communication style that is causing you to become flustered and show disapproval for their lack of hand raising or shouting out? This is in alignment with past research that has found performance feedback to be successful with preservice teachers when the delivery is specific, positive and corrective (Scheeler et al., 2004). The performance feedback paired with the intervention materials focused on forming positive classroom environments provided additional supports for pre-service teachers in the intervention group compared to control group. Considering that the feedback provided in this study included key essential components (i.e., specific, positive, corrective) it is

likely that it uniquely added in the effectiveness of the overall intervention package and improved targeted teacher behaviors (Auld et al., 2010; Capizzi et al., 2010)

Previous research has also found that teachers in general need a lot of support in order for them to change their positive and negative interactions (Armstrong & Field, 2012). Even more so, didactic training alone is not sufficient to increase teacher's positive interactions relative to their negative interactions and additional components such as individualized modeling, role-playing, and feedback are necessary for teachers to be more successful (Armstrong and Field, 2012). Extending those findings, the current results demonstrated that participation in the training which also included the added component of feedback produced higher positive to negative interaction ratios relative to the control group.

Most research on positive and negative interaction ratios (e.g., Beaman & Wheldall, 2000; Hargreaves, 2000; Heller & White, 1975) tends to find that people engage in more negative interactions or lower PN ratios. For example, Myers et al., (2011) provided a month of training in school wide positive behavior support and found that not one of the teachers had PN ratios of 4:1 or higher. Moreover, findings from the cognitive psychology field revealed that people tend to be fixated on the negative because it is "a stimuli that is incongruent with expectations" (Cook et al., 2017; Gottman, 1994). On the contrary, in this study during pre-test and post-test preservice teachers engaged in more positive interactions on average. It is possible that preservice teachers were more intentional about delivering positive interactions due to the background provided to them on the studies purpose. However, even more compelling, it is also possible that the predetermined structure of the lessons pre-service teachers was required to enact within the mixed reality classroom (i.e., "morning meeting", "classroom meeting") contributed to more positive interactions overall.

A morning/classroom meeting lesson structure was chosen as the lesson for pre-service teachers to use within the mixed reality classroom for observation because the structure (i.e., greeting, rule review, sharing, activity, morning message) of morning meetings is inherently very powerful in building a community of learners which is essential for building a responsive classroom (Edwards & Mullis, 2003; Responsive Classroom, 2016). Morning meetings or classroom meetings are all forums for discussing social problems and engaging in effective communication skills so that interactions are positive and supportive. In this study preservice teachers used their morning meeting lesson time to teach social emotional skills, problem solving skills or coping strategies. Each of these topics allowed for the pre-service teacher to incorporate more positive interactions than negative interactions. For example, one pre-service teacher showed students how to participate in meditation exercises, another pre-service teacher engaged students in identifying their zone of emotional regulation and during conversations regarding recent school violence one pre-service teacher incorporated poetry from Maya Angelou that reinforced to not be frightened or afraid of life. Classroom morning meetings are also in alignment with culturally responsive classroom management as studies have found improved emotional understanding, an increase in empathy, respect for differences, and an overall more positive and caring classroom setting when classroom morning meetings are integrated into the curriculum (Browning et al., 2000; Edward & Mullis, 2003; Sorsdahl & Sanche, 1985).

Research Question 2: To what extent did participation in the culturally responsive classroom management intervention influence pre-service teacher's belief that they could implement culturally responsive classroom management practices?

Findings of teacher self-efficacy research contend that higher classroom management self-efficacy beliefs are positively correlated with implementation of supportive strategies (Gordon,

78

2001). In comparison, lower self-efficacy scores result in the use of negative consequence and punishment, or teachers leaving the field (Schwarzer & Hallum, 2008). The culturally responsive classroom management self-efficacy scale specifically addresses issues for managing a classroom of students from diverse backgrounds. A key finding that came from examining the CRCMSE survey scores across the intervention and control group was that the intervention group scored higher at post-test (m=74.14) than the control group (m = 64.61). This means that preservice teachers in the intervention group became more confident in their ability to successfully carry out some of the tasks associated with CRCM.

The post-test scores in this study are slightly lower than the average strength index score reported during the validation of the CRCMSE scale (M=80,73; SD = 11.54; Siwatu et al., 2015). The difference in scores could be the result of a variety of factors such as differences in experiences and how the ways those experiences are integrated into self-efficacy concept (Siwatu et al., 2015). The mean difference from pre-test to post-test was also greater for the intervention group then the control group. This finding indicates that training on culturally responsive classroom management may have an impact on pre-service teachers perceived capabilities.

One thing this study did not do, but if done may have aided in better statistical evidence is provide an opportunity for pre-service teachers to engage in thoughtful reflection after their mixed reality sessions. Bandura (1997) asserted that although teachers may be exposed to information it does not become helpful or instructive until it goes through cognitive processing of efficacy information and reflective thought. Another important thing to note is that even though the control group did not receive the intervention their self-efficacy scores still fluctuated a bit. This may be because preservice teachers under and overestimate their self-efficacy (Wyatt, 2012).

Research Question 3: To what extent did teachers find the intervention acceptable and effective?

Social validity assessment can provide researchers with information regarding which aspects of the intervention were appropriate, should be adopted in future interventions, avoided, or discontinued (Strohmeir, Mule, & Luiselli, 2014). An important finding from the social validity results revealed that pre-service teachers found the use of the mixed reality sessions to be a great form of practice. This finding resonates with previous research on the use of mixed reality as an opportunity for students to develop, practice, and refine skills (Dieker, Straub et al., 2014; Dieker et al., 2008). Since many of the pre-service teachers in the study had very little to no classroom experiences the mixed reality technology was able to serve as a useful tool for interacting with realistic childlike avatars.

Similar to other studies that have used mixed reality environments with preservice teachers, the increased awareness and attentiveness that preservice teachers gained is an important learning opportunity (Hudson, Voytecki and Zhang, 2018). Ellis (1986) suggested that pre-service teacher education should cover awareness raising and experiential learning. Within this study, based on the results of the social validity assessment pre-service teachers felt that the study included both of those components.

For this study, live coaching during pre-service teacher's mixed reality session did not take place. Some of the pre-service teachers had indicated that they wanted more time using the mixed reality session because they were still getting use to what the avatars could or could not do. Given that feedback, in a future study, a live coaching session after baseline may be helpful or a tutorial session before data collection to get preservice teachers acquainted with the avatars. Another important finding from the social validity questionnaire was that every single pre-service teacher felt strongly that the study was appropriate for pre-service teachers. Additionally, most pre-service teachers agreed that they were better able to work with a diverse set of learners and manage

classroom behaviors. This is a critical finding and shows evidence of the positive results of having pre-service teachers engage with a study that considers diversity in the context of classroom management.

5.3 Limitations

There were a few different potential limitations for this study. The first limitation concern is the study had a small sample size. As a preliminary investigation the study was designed to have a small sample size, however this means that the results may not be generalizable to the larger population and are not as precise as they could be if there were a larger sample size. In addition, the sample itself includes primarily participants who identified as white females. Perhaps results and the types of positive interactions would have been different if the gender and race of the participants were different.

Secondly, pre-service teachers were given the creative freedom to design and implement their own morning meeting lesson plan instead of being given a standardized plan. In addition, preservice teacher's post-test lesson was allowed to vary based on feedback or how they felt the pre-test went which means that it wasn't exactly the same at pre-test. This lack of standardization may have impacted the variability in the number and types of interactions that occurred during the simulation.

Third, even though pre-service teachers felt the mixed reality sessions provided a realistic simulation, each of the avatar students in the classroom are controlled by one interactor and the avatar students are restricted in some of the behaviors that they can perform (e.g., avatars couldn't get out of seats, avatars couldn't engage in physical altercations, avatars couldn't do choral responses or speak simultaneously). This is a possible limitation to ecological validity because the performance of pre-service teachers in the mixed reality sessions may vary from the performance of pre-service teachers in an actual classroom environment. Therefore, it may be difficult to reasonably generalize the findings

of the study to other settings in the 'real world' where pre-service teachers may encounter more physical altercations between students. Moreover, the findings of this study indicated that pre-service teachers used more positive than negative interactions overall, which could have been impacted by the lack of physical altercations that may actually occur within a real-world classroom setting.

Given the pre-test post-test design of this study there are some threats to external validity. It is possible that participation in the pre-test influenced participants to start thinking more consciously about positive interactions and their own culturally responsive classroom management beliefs because of the exposure to the pre-test. Another threat to external validity is participants may have changed their behavior because they were told that they were being recorded, studied, and the researcher was present during the session.

5.4 Implications for Practitioners

This study raises several questions as to the use of a didactic training model to deliver instruction, and benefits of using mixed reality sessions within pre-service preparation programs for practice. The results of the study indicated that an hour virtual didactic training in culturally responsive classroom management and performance feedback may improve pre-service teachers' positive interactions with students. As more and more universities begin to offer online courses, professional developments or trainings to pre-service and novice teachers, this could be a great training experience with positive results that would only require participants to dedicate around 2-3 hours of their time. I would recommend that the didactic training either take place asynchronously or if staff and timing permits, to conduct a follow up coaching session with pre-service teachers to maximize results.

In addition to the training, the mixed reality sessions provide a way for pre-service teachers to gain additional practice on a particular set of skills. It goes beyond the traditional role playing, and

provides a realistic environment for pre-service teachers to fail and try again without potentially harming children. I would also recommend that pre-service teachers have a way to reflect on their experiences. After the mixed reality sessions, the pre-service teachers seemed to have a lot of thoughts about the experience and providing a space to unpack those thoughts could help with growth from one session to the next. Zichner and Liston (2014) encourages discussion groups where teachers can reflect on events that happened during teaching to help reframe their understandings in new and productive ways. Furthermore, engaging in critical self-reflection with others can allow pre-service teachers to grow their repertoire of understandings pertaining to equity related issues.

5.5 Future Directions for Research

There are many considerations for future research. Future directions for research are provided below.

1. Future research could employ a qualitative analysis that makes use of value coding procedures that help to understand the values and beliefs that are being conveyed about behavior through teacher-student interactions during a morning meeting session. During the review of classroom rules portion of the pre-service teacher's morning meeting lessons, pre-service teachers frequently conveyed the why behind their expectations or rules. A critical analysis of these particular interactions could contribute to the culturally responsive classroom management framework.

2. Future research could employ using different simulation interactors for sessions and seeing what type of impact that particular component may have on the experiences of pre-services teachers during the session.

3. Future research could extend the duration of the study and roll out the intervention in phases so that pre-service teachers are able to dive deeper and practice each piece of content separately. For example, pre-service teachers receiving training on behavior specific praise and the sole focus in the mixed reality session that day could be increasing behavior specific praise. Then, pre-service teachers receive training on coercive statements or avoiding junk behavior and the sole focus in the mixed reality session that day is working to avoid those negative interactions.

4. Another area of research interest would be to investigate the generalizability of the skills practiced in the mixed reality session into the actual classroom. This would provide stronger evidence that the mixed reality sessions provided adequate practice or realistic classroom environments.

5. Perhaps if in addition to feedback more components were included within the intervention model, then more statistically significant changes would have occurred. Social emotional theory posits that individuals learn how to behave largely through observation of others. This is frequently seen in teacher preparation programs where the pre-service teacher conducts observations of a mentor teacher. However, the skill of detecting, isolating and organizing classroom interactions from video observations of one's own teaching has been reported to support the development of pre-service teacher's skills (Jamil et al., 2015). Therefore, future research should explore incorporating this added component to the intervention model.

6. Lastly, future research should conduct this study with a larger sample size. A larger sample size would afford more power to do different inferential statistics such as comparing self-efficacy scores with observed PN interactions.

5.6 Conclusions

Positive classroom environments that are rooted in equitable, culturally responsive-sustaining practices should be the golden standard in order for our students to thrive and be successful. At the root of the formation of a positive classroom environment are strong teacher-student relationships (Gay, 2002; Ladson-Billings, 1994; Weinstein et al., 2004). These relationships are formed from positive interactions. An increase in positive interactions and a reduction in negative interactions through an understanding of culturally responsive classroom management practices can have a tremendous impact on culturally, economically and linguistically diverse students and students with disabilities who are typically subjected to negative interactions and punitive disciplinary practices. However, there is scant research examining the effects of classroom management training for pre-service teachers, and even more scant research using mixed reality software. The research of a culturally responsive (sustaining) classroom management intervention package revealed a significant impact on the intervention groups positive teaching interactions and a change on pre-service teachers culturally responsive classroom management self-efficacy scores. Throughout the mixed reality sessions, pre-service teachers' positive interactions showed empathy, encouragement, and a growth mindset which are all essential for the implementation of culturally responsive classroom management practices. After participation in this study, pre-service teachers felt more prepared to work with diverse learners and respond to students' behaviors.

Summary of Included Literature Review Articles

Authors	Participants/Setting	Purpose of study	Independent Variables	Research Method	Dependent Variables and Instrumentation	Results
(Dawson & Lignugaris-Kraft, 2016)-	n = 4; graduate level students enrolled in a Mild/Moderate Alternative Teacher Preparation program Setting: TLE course (middle school classroom) held at a university on the western part of USA.	To investigate the effectiveness of the TLE intervention session on pre service special educator's development of foundational behavior and academic skills and generalization of the skills	Practice and observation in the TLE classroom was the primary IV in addition to didactic instruction, feedback, and written reflection	Single-subject: multiple baseline design across target skills replicated; generalization data	Specific praise statements per minute, % of correctly delivered praise around steps, % of correctly delivered error correction steps	All teachers increased their delivery of praise around, specific praise, and error correction after using TLE.
(Hudson M. E., Voytecki, Owens, & Zhang, 2019)-	n = 29; junior year undergraduate teacher candidates in a special education general or adapted curriculum program enrolled in a classroom management course	Effects of mixed reality teaching experiences on preservice teachers' perceptions of their own readiness for classroom management	Three five-minute mixed reality Mursion experiences with 5th grade students, video reflection,	Mixed methods; survey outcomes analyzed through statistical analysis and thematic analysis of verbal responses; triangulation	Participants completed a Participant Perceptions Likert survey after each Mursion experience session measuring perception of Mursion experience, classroom management scores, and teaching scores	Participants' ratings were virtually unchanged across sessions despite the increasing intensity of the avatars' challenging behavior

Summary of Included Literature Review Articles

Authors	Participants/Setting	Purpose of study	Independent Variables	Research Method	Dependent Variables and Instrumentation	Results
(Hudson, Voytecki, & Zhang, 2018)	n = 25; undergraduate junior preservice teachers enrolled in a K-12 special education program (general curriculum or adapted curriculum)	Determine the efficacy of mixed reality teaching experiences on pre service teachers' perceptions about managing student behaviors	Immersion in three scenarios using a middle school Mursion lab/TeachLivE	Mixed methods using qualitative (thematic coding of videotaped 1-minute reflections) and quantitative data.; triangulation	Transcribed videotaped reflection and frequency of participant responses to questionnaire statements	Participants gained confidence in classroom management, became aware of behavior management skills they were missing, and found it challenging to manage disruptive behaviors positively (16% disagreed that they could effectively manage the classroom).
						79% agree that they were able to practice new management skills;
(Kirkpatrick, Rehfeld, Akers, Rivera, & Sulak, 2021)-	n = 5; undergraduate sophomore preservice teachers enrolled in special education teacher prep course focused on literacy	Evaluate the effectiveness of BST (Behavior Skills Training) to train pre service teachers to implement a token economy.	45-minute behavior skills training (20 minutes of instruction, 25 minutes for modeling, rehearsal opportunities and feedback); 10-minute feedback sessions provided to participants who failed to meet mastery criteria	SingleSubject: Multiple baseline design across participants /observational	Accuracy/Percentage of token economy steps completed on the task analysis	Students increased accuracy of implementation of a token economy in comparison to baseline performance. For three of the students the feedback session helped them reach mastery criteria after the intervention.
(Klopfer, Jenkins, Scott, & Ducharme, 2019)-	n = 118; training to teach K to 6 or Grades 4 to 10 who elected to	Expand on previous research about classroom management training in preservice	ECM course: 4 hours a week over 9 weeks and included a combination of lecture,	Quantitative: Randomized Control Trial	Teaching self-efficacy using The Teachers' Sense of Efficacy Scale	Students enrolled in the ECM course compared to the control group were

Summary of Included Literature Review Articles

Authors	Participants/Setting	Purpose of study	Independent Variables	Research Method	Dependent Variables and Instrumentation	Results
	enroll in an ECM course	education by evaluation the effectiveness of offering specific instruction in proactive behavioral management	modeling, video review, and practice through role playing		Teaching style: Using the Swiss Teaching Style Questionnaire Teacher's Attitudes toward Learning and Behavioral Problems Scale Teaching Strategies: Observations and videotape of teaching in simulated classroom	more likely to use proactive strategies with effect sizes medium to large. Teachers who received intervention did not differ in self efficacy or endorsement of a teaching style. The study also found those in the ECM course did have change in their attitudes toward students with behavioral difficulties
(Markelz, Taylor, Scheeler, Riccomini, & McNaughton, 2018)	n = 1; enrolled in a 5-year undergraduate/graduate program to obtain a B.S. in special education with dual certification as a reading specialist and Master's degree in Curriculum and Instruction	Determine the effectiveness of prompting with wearable technology to increase classroom management behaviors of the preservice teacher	Using wearable technology (apple watch) 10 text message prompts per 15-minute session on a variable interval schedule were delivered using an apple watch	Single Subject: Multiple baseline across behaviors no generalization	Frequency of behavior specific praise, engaging in active questioning, and conducting classroom scanning. Social Validity was also collected via a questionnaire	The frequency of targeted teaching behaviors increased for all behaviors when prompting with wearable technology. BSP did not maintain when the prompting was faded. Social validity combined with data results suggests that prompting is effective in implementing BSP, active questioning and classroom scanning.
(Peterson-Ahmad, 2018)	n = 8; undergraduate pre service special education teachers	Measure the efficacy of the combined use of TeachLivE and	Instructional coaching was given to half of the participants after each	Exploratory case study	The number of OTR provided by the teacher in each simulation	This study found that participation in TeachLivE sessions

Summary of Included Literature Review Articles

Authors	Participants/Setting	Purpose of study	Independent Variables	Research Method	Dependent Variables and Instrumentation	Results
		instructional coaching with preservice teachers	of the four Teach Live simulations while the other half did not receive instructional coaching; self-reflection questions were answered following all simulations for each group with discussion held for IV group	Quantitative: observational data Qualitative: self-reflections; anecdotal notes; triangulation; written statements; used nVivo; themes	session was measured as well as an analysis of participants written self-reflections	increased use of OTR between the first and final session. Qualitative data revealed that teachers noticed specific student characteristics and behaviors and thought about how best to minimize disruptions
(Sciuchetti & Yssel, 2019)	n = 23; enrolled in a dual elementary and special education program Setting: Placements in urban and special education; diverse student populations	Explored preservice teachers developing self-efficacy for classroom management	Four consecutive semesters over two academic years of professional development sequence that aligned coursework and field placement (13 weeks)	Exploratory Quantitative: Descriptive statistics and inferential statistics Qualitative: Grounded theory (open and axial coding) used to analyze open ended question responses; thematic coding	Survey administered at 5 different time points 29 item Likert survey adapted from the Behavior Management Self Efficacy Scale and Teacher Efficacy in Classroom Management and Discipline Scale to gain information about teachers' self-efficacy for classroom and behavior management	When compared to BOS I levels, there were statistically significant differences in the level of self-efficacy for EOSII, EOSIII, EOSIV. Participants rated high on ability and knowledge prior to the intervention and at the EOS IV. Items categorized as locus of control were rated lower than ability and knowledge across all semesters.

Appendix B Project Budget

Inputs	Comments	Time (Total Hours)	Cost
Researchers			
•Principal Investigator	•Will be responsible for full execution of the research study and oversee recruitment, data collection and analysis		0.00
•Secondary Coder	•Will be responsible for watching recorded sessions of the simulation and coding teacher behaviors.		0.00
SIMPACT Session			
• SIMPACT Immersive Learning	•2-hour Facilitation Training (required for new clients) •5 two-hour simulation sessions (includes a tech check, simulation and any debrief time) •1 customized scenario (involves pre-planning, up to two hours with a simulation specialist, and post production)		3,500
Additional Supplies			
•Qualtrics	•Available through the University		0
•SPSS Statistical Analysist Survey	•Available through the University		0
•Training Materials	•Created using software available through the University		0
Participant Supplies			
•Copy of "These Kids are out of Control"	•Provided to students in the intervention group		
•Participation Payment	•$75 for control group ($450) •$75 for experimental group ($450)	Control: approximately 1 hour Experimental: approximately 3 hours	900
			Total 4400

Appendix C Sociodemographic Questionnaire

Sociodemographic Questionnaire
Please read each statement and answer the questions carefully. (1-2 minutes)

(1) Age: _____

(2) Gender
      O Male
      O Female
      O Prefer not to say
      O Prefer to self-identify: _____

(3) Ethnicity
      O White
      O Black
      O American Indian or Alaska Native
      O Native Hawaiian or Pacific Islander
      O Latino or Hispanic
      O Other: _____

(4) What is your primary language spoken at home?

      _____

(5) What is your highest level of education completed?
      O Some college
      O Bachelor's Degree
      O Master's Degree
      O Doctoral Degree

(6) How many years of full-time teaching experience in a classroom setting do you have?
      O _____

(7) How many classroom management trainings, professional development, or courses have you completed?
      O _____

(8) How many culturally responsive trainings, professional development, or courses have you completed?
      O ___

(9) What type of job do you hope to acquire after graduation?

      _____

Appendix D Culturally Responsive Classroom Management Self Efficacy Scale

Directions: Rate how confident you are in your ability to successfully accomplish each of the tasks listed below. Each task is related to classroom management. Please rate your degree of confidence by recording a number from 0 (no confidence at all) to 100 (completely confident). Remember that you may use any number between 0 and 100.

	0 No Confidence at all	10	20	30	40	50 Moderately Confident	60	70	80	90	100 Completely Confident
1.Assess students' behaviors with the knowledge that acceptable school behaviors may not match those that are acceptable within a student's home culture.											
2. Use culturally responsive discipline practices to alter the behavior of a student who is being defiant.											
3. Create a learning environment that conveys respect for the cultures of all students in my classroom.											
4. Use my knowledge of students' cultural backgrounds to create a culturally compatible learning environment.											

5. Establish high behavioral expectations that encourage students to produce high quality work.										
6. Clearly communicate classroom policies.										
7. Structure the learning environment so that all students feel like a valued member of the learning community.										
8. Use what I know about my students' cultural background to develop an effective learning environment.										
9. Encourage students to work together on classroom tasks, when appropriate.										
10. Design the classroom in a way that communicates respect for diversity										
11. Use strategies that will hold students accountable for producing high quality work.										
12. Address inappropriate behavior without relying on traditional methods of discipline such as office referrals										
13. Critically analyze students' classroom behavior from a cross-cultural perspective.										
14. Modify lesson plans so that students remain actively engaged throughout the entire class period or lesson.										
15. Redirect students' behavior without the use of coercive means (i.e., consequences or verbal reprimand).										
16. Restructure the curriculum so that every child can succeed, regardless of their academic history.										

93

17. Communicate with students using expressions that are familiar to them										
18. Personalize the classroom so that it is reflective of the cultural background of my students.										
19. Establish routines for carrying out specific classroom tasks										
20. Design activities that require students to work together toward a common academic goal.										
21. Modify the curriculum to allow students to work in groups.										
22. Teach students how to work together										
23. Critically assess whether a particular behavior constitutes misbehavior										
24. Teach children self-management strategies that will assist them in regulating their classroom behavior.										
25. Develop a partnership with parents from diverse cultural and linguistic backgrounds										
26. Communicate with students' parents whose primary language is not English.										
27. Establish two-way communication with non-English speaking parents.										
28. Use culturally appropriate methods to relate to parents from culturally and linguistically diverse backgrounds.										
29. Model classroom routines for English Language Learners										

30. Explain classroom rules so that they are easily understood by English Language Learners											
31. Modify aspects of the classroom so that it matches aspects of students' home culture.											
32. Implement an intervention that minimizes a conflict that occurs when a students' culturally based behavior is not consistent with school norms.											
33. Develop an effective classroom management plan based on my understanding of students' family background											
34. Manage situations in which students are defiant.											
35. Prevent disruptions by recognizing potential causes for misbehavior.											

Appendix E Instructional Powerpoint Series

Title of Instructional Power Point 1:	Introduction to Culturally Responsive Classroom Management and Rapport Building
Learning Objectives:	By the end of the instructional PowerPoint, participants should know how to: • Develop caring classrooms using CRT practices • Learn the "stay close" or "study their students" strategy • Draw on cultural assets of students, families and communities to build rapport and make classroom management moves
Brief Description of Scenario:	The first instructional PowerPoint will define and discuss culturally responsive classroom management. The inhere is a shift in thinking from how do I change a child's behavior to what is it about my own behavior that needs modified. This Powerpoint will discuss how teachers can develop caring classrooms and build strong rapport with students using the 'stay close' strategy. Teachers will learn that if they 'stay close' or 'study their students' (Ladson-Billings, 2009) then they will be able to draw on the cultural assets of students, families, and communities and use it build rapport and make classroom management moves.

Title of Instructional Power Point 2:	Positive Framing/Communicating in Culturally Consistent Ways
Learning Objectives:	By the end of the instructional PowerPoint, participants should know how to: • Use behavior specific praise • Use positive framing to create belongingness
Brief Description of Scenario:	The second instructional PowerPoint will discuss the use of culturally and ethnically congruent communication processes to engage in positive interactions with students. For example, some children may come from cultural groups where overlapping speech is normal, but a teacher may see it as disrespectful and respond negatively. This Powerpoint will also examine the importance of teachers using a positive framing to help them see that they belong in the classroom. This presentation will emphasize positive behavior specific praise and how to provide positive reinforcement such as appropriate positive gestures.
Additional Materials/Resources Provided:	IRIS Module

Title of Instructional Power Point 3:	Avoiding Coercion/Recognizing Ethnocentrism
Learning Objectives:	By the end of the instructional PowerPoint, participants should know how to: • Avoid coercion traps • Identify their own implicit biases • Identify how their own beliefs and bias may create negative interactions with culturally and linguistically diverse students
Brief Description of Scenario:	The third Powerpoint will describe coercion traps (arguments, force, sarcasm, pleading, etc.) that teachers get caught in and how to avoid those traps. There will also be a discussion about teacher beliefs, bias and self-awareness and how sometimes, as humans we often act and react from our implicit bias. This session is grounded in building the understanding that teachers need to have self-awareness because it effects their teaching. Teachers will be prompted to engage in questions that will enable them to examine their own implicit biases to gain a deeper interpersonal aspect of classroom culture.
Additional Materials/Resources Provided:	Harvard Implicit Bias Survey

Appendix F Observational Sheet

Coder Name: Reid

Student: Date: IOA: YES   NO
Start Time   End Time: Condition: Baseline or Post IV
Video name:

Min	Time	Positive Interactions				Negative Interactions								
		GP	BSP	Other	Total	THR	Y	F	CRI	RR	ARG	LL	Other	Total
0														
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
														5

Positive interactions: _____   Comments:

Negative Interactions: _____   Positive Interactions:
Total Interactions: _____
P/N Ratio: _____   Negative Interactions:
PI Section
IOA: _____   Culturally Responsive Teaching Notes:
agreements/ agreement+disagreements × 100

98

Appendix G Social Validity Questionnaire

Please rate the extent to which you find the following useful or in agreement with. Provide a

written short reply to questions 5-6. (Likert Sliding Scale on Qualtrics)

1. How would you rate the usefulness of the instructional materials?

    1   2   3   4   5

2. How would you rate the usefulness of interacting within the mixed reality classroom?

    1   2   3   4   5

3. How would you rate the usefulness of the instructional materials and mixed reality sessions

combined?

    1   2   3   4   5

4. To what extent would you recommend that other pre-service teachers receive the intervention?

    1   2   3   4   5

5. I am better able to respond appropriately to challenging student behaviors.

    1   2   3   4   5

6. I found this study helpful for preparation to work with diverse learners.

    1   2   3   4   5

7.To what extent do you think the intervention will impact your positive and negative

interactions with students now that the study is over? Please explain.

8.How do you feel your skills in applying culturally responsive practices to classroom

management changed? Please explain.

9. What components of the intervention did you like the most? What would you recommend changing?

10. Is there anything else you want to share?

Appendix H Procedural Fidelity for Mixed Reality Sessions

Steps Completed	Session 1	Session 2	Session 3	Session 4
1. Did the researcher conduct a 15-minute tech check at the beginning of the session?	Yes	yes	yes	yes
2. Were the rules of the simulation explained to participants prior to starting session?	Yes	yes	yes	yes
2. Did the researcher place upcoming participants in a waiting room prior to session?	Yes	yes	yes	yes
3. Did the researcher record the zoom session?	Yes	yes	yes	yes
4. Did the researcher insert notes into the feedback form?	Yes	yes	yes	yes
A total score of 80% or higher reflects good treatment fidelity.	Total Score	100%	100%	100%

APPROVAL OF SUBMISSION (Expedited)

Date:	May 10, 2022
IRB:	STUDY22010124
PI:	Milsha Reid
Title:	Forming Positive Classroom Environments Through the Use of a Culturally Responsive Classroom Management Intervention Package
Funding:	None

The Institutional Review Board reviewed and approved the above referenced study. The study may begin as outlined in the University of Pittsburgh approved application and documents.

Approval Documentation

Review type:	Initial Study
Approval Date:	5/10/2022
Expedited Category	(6) Voice, video, digital, or image recordings, (7)(b) Social science methods, (7)(a) Behavioral research

Determinations:	• Students / Employees
Approved Documents:	• Sociodemographic Questionnaire, Category: Data Collection; • CRCM Self Efficacy Survey , Category: Data Collection; • Social Validity Survey , Category: Data Collection; • Observational Data Collection Sheet CRCM, Category: Data Collection; • Consent Form, Category: Consent Form; • CRCM Recruitment Flyer, Category: Recruitment Materials; • CRCM Sample Recruitment Email, Category: Recruitment Materials;

As the Principal Investigator, you are responsible for the conduct of the research and to ensure accurate documentation, protocol compliance, reporting of possibly study-related adverse events and unanticipated problems involving risk to participants or others. The HRPO Reportable Events policy, Chapter 17, is available at http://www.hrpo.pitt.edu/.

No continuing review is required, so there is no expiration date associated with this study. Please, however, note the following statements below as they pertain to your responsibilities going forward:

It is still your responsibility to submit modifications, reportable new information, and to close the study when it is completed.

Also, be advised that your research study may be audited periodically by the University of Pittsburgh Office of Research Protections.

Clinical research being conducted in an UPMC facility cannot begin until fiscal approval is received from the UPMC Office of Sponsored Programs and Research Support (OSPARS).

If you have any questions, please contact the University of Pittsburgh IRB Coordinator, Amy Fuhrman.

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