# AN EXAMINATION OF PYRAMID MODEL IMPLEMENTATION IN A NEW JERSEY PRESCHOOL

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A Dissertation

Presented to

The Faculty of the College of Education

William Paterson University of New Jersey

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In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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By Raquel Lima

March, 2025

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# ABSTRACT

Preschool teachers play a critical role in fostering young children's social-emotional development, yet they often lack the necessary training and support to address challenging behaviors effectively. This study examines the implementation of the Pyramid Model (PM) in a public preschool program in New Jersey over five school years, with a particular focus on the impact of professional development (PD) and practice-based coaching (PBC) on teacher practices. This research employs a program implementation evaluation study approach by examining quantitative data from the Teaching Pyramid Observation Tool (TPOT) with qualitative insights from a teacher survey. Findings suggest that teachers who received PM module training in addition to PBC demonstrated higher fidelity in implementing PM teaching practices, as measured by TPOT scores, compared to teachers who received only PBC. However, over time, a decline in fidelity was observed across all participants, suggesting a need for sustained PD and systemic support. Thematic analysis of teacher survey responses highlighted key implementation challenges, including the need for ongoing support, resource allocation, and strategies to address implicit bias. This study contributes to early childhood education by providing empirical evidence on the long-term sustainability of PM implementation. Findings underscore the importance of structured PD and PBC in enhancing teacher practice and promoting equitable, inclusive learning environments for all preschool children. It is a call to action for early childhood leaders to ensure that multi-tiered systems of support (MTSS) are in place and data is consistently monitored to best support preschool teachers, students, and families.

# DEDICATION

This dissertation is lovingly dedicated to my family, friends, and colleagues who have stood beside me throughout this journey. To my husband, partner, and best friend, Salvatore Lima Jr.—your unwavering support, love, and encouragement have been my steady foundation. Thank you for believing in me, even when I doubted myself, and for being my constant source of strength.

To my parents, Alfonso and Ann Marie Ciampa, and my incredible children, Salvatore and Amalia, thank you for the countless sacrifices you have made so I could reach this milestone. Your love and belief in me have fueled my determination every step of the way.

To my grandparents, Mario and Amalia Ciampa, and Frank and Marie Galati, your lives, marked by perseverance, grace, and unconditional love, continue to inspire me every day. I carry your legacy in my heart and in this work.

And to my sister, Alexandra DuVall—our shared journey has shaped the person I've become. You are a reminder of why my heart is in early childhood education: to ensure that all children, regardless of background, receive the care and opportunity they deserve.

# ACKNOWLEDGEMENTS

This work would not have been possible without many individuals' guidance, support, and encouragement. I am incredibly grateful to Dr. Heejung An for her unwavering support, insightful guidance, and dedication throughout this journey. Her mentorship has been instrumental in shaping this dissertation, and I sincerely appreciate her patience, encouragement, expertise, and belief in me. I also extend my sincere gratitude to Dr. Samuel Fancera and Dr. Anita Kumar for their valuable insights, thoughtful feedback, and guidance. Your contributions have strengthened this dissertation, and I genuinely appreciate the time and expertise you have invested in my work. I also want to extend a heartfelt thank you to the faculty and staff of the Pyramid Equity Project (PEP) and the National Center for Pyramid Model Innovations (NCPMI) for their commitment to early childhood education. Furthermore, I am incredibly grateful to my fellowship mentor, Dr. Lise Fox, who has profoundly shaped my understanding of program-wide Pyramid Model implementation and young children's social-emotional development. I am forever grateful for her mentorship and guidance.

Last but certainly not least, I would like to acknowledge and thank God for His guidance and strength throughout this journey. To my mentors, family, friends, and colleagues—thank you for your unwavering support. This dissertation highlights the importance of ongoing PD and PBC for preschool teachers, and I hope it serves as a meaningful contribution to early childhood education.

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# CHAPTER I

# INTRODUCTION

Preschool teachers encounter children with various skills, strengths, and abilities. Preschoolers vary uniquely regarding their individual social and behavioral development and support needs. Therefore, preschool teachers may find it challenging to assist children with significant social, emotional, and behavioral needs while maintaining a developmentally appropriate and supportive learning environment for all children. Research in early childhood education (ECE) emphasizes the critical role of social-emotional competence in children's readiness for school and early school adjustment (Jamil et al., 2022).

Social-emotional learning (SEL) is a vital process involving acquiring and applying skills such as managing emotions, fostering empathy, solving problems, communicating assertively, maintaining healthy relationships, and making responsible decisions. Studies indicate that students taught SEL skills experience a stronger connection to school, perform better academically, exhibit improved behavior, form more friendships, and feel a greater sense of inclusion. Teaching SEL skills also helps decrease the likelihood of challenging behavior, enabling teachers to focus on enhancing student academic achievement (Murano et al., 2020).

Explicitly teaching SEL skills allows children to regulate their behavior and engage in prosocial actions, leading to increased success in school and life (Upshur et al., 2017). Preschool teachers require targeted training and ongoing support to impart these essential skills to young children. Ensuring educators are well-equipped to teach SEL skills fosters a positive learning environment and promotes positive student outcomes.

In response to the growing need for an evidence-based framework to promote healthy social-emotional development in young children, the Pyramid Model (PM) was developed by

two federally funded research and training centers, namely The Center for the Social and Emotional Foundations for Early Learning and the Technical Assistance Center on Social Emotional Intervention for Youth Children. The PM offers a tiered intervention framework for promoting young children's social, emotional, and behavioral development. The framework outlined in the *Pyramid Model for Supporting Social-Emotional Competence in Infants and Young Children* encompasses evidence-based interventions (Fox et al., 2003; Hemmeter et al., 2006). Functioning as a program-wide approach, it provides guidance to preschool teachers, offering research-based practices to enhance the social-emotional competence of all children, prevent delays for those at risk, and support those exhibiting persistent challenging behavior (Hemmeter et al., 2021).

In summary, the PM was developed to create a structured, research-based framework to help early childhood programs promote social-emotional development, prevent behavioral challenges, and ensure that all children, regardless of their abilities, can thrive in learning environments. However, while the PM is an evidence-based framework, the effectiveness of its implementation relies heavily on PD and PBC provided to educators. Despite many resources, teachers need structured training, support, and follow-up coaching to apply the model's strategies in classroom settings effectively. Implementation fidelity can vary without sufficient PD and PBC, potentially diminishing the model's intended outcomes.

Despite the adoption of the PM in early childhood settings across the globe, limited research exists on the long-term impact of PD and PBC on teacher practices within this framework. While studies have demonstrated the effectiveness of the PM, there remains a critical gap in the literature regarding how PD and PBC influence its sustainability and impact over time. This gap underscores the need for further research to determine the most effective

ways to support educators in implementing the PM to fidelity, ensuring lasting benefits for young learners.

This study, therefore, investigated the program-wide implementation of the PM in a New Jersey public school district, focusing on the impact of PD related to the PM on teacher practices over five school years. Additionally, the study explored effective strategies for implementing PM to fidelity, which aimed to enhance teacher practices in teaching preschoolers social-emotional skills and, consequently, improve overall student learning outcomes.

## State Context

In September 2016, the Senate and General Assembly of the State of New Jersey enacted a law concerning expulsions and suspensions for young students, supplementing Chapter 37 of Title 18A of the New Jersey Statutes and amending P.L.1995, c.426. In part, the law prohibited suspending and expelling students enrolled in preschool in a school district or charter school. The law also called for school districts and charter schools to implement an early detection and prevention program to identify students experiencing behavioral or disciplinary problems and provide behavioral support for those students.

Following the amendment to the state law, the New Jersey Department of Education (NJDOE) released the *Early Childhood Student Suspension/Expulsion Guidance*, which stated, "School districts, Head Start agencies, and private providers are encouraged to utilize the PM to support the social and emotional development of young children" (New Jersey Department of Education, 2016, p. 3). The NJDOE recommended implementing the PM in the Preschool Program Implementation Guidelines released in 2015 and 2019.

## Statement of the Problem

### Background

Research (Jamil et al., 2022) suggests preschool teachers could benefit from PD to address children's challenging behavior effectively. Teachers who are not effectively trained in positive behavior support may not respond appropriately to children's challenging behaviors. In some instances, children and their families are asked to leave their preschool because of the child's behavior. Essentially, that means those young children are suspended or expelled from school. In most cases, it is partially because the preschool personnel did not have the skills, resources, or support to meet the children's needs effectively.

In 2014, in response to the increase in preschool suspension and expulsion, the US Department of Health and Human Services and the USDOE issued a joint policy statement that said early expulsion or suspension predicts later expulsion or suspension. It also asserted that estimates indicated that the rates of expulsion or suspension in early education were higher than in K–12 settings. Furthermore, it declared that the data consistently indicated significant racial disparities, with young boys of color being suspended and expelled at disproportionately higher rates. Black children were only 19% of the preschool population but comprised 47% of suspensions (United States Department of Education, 2014). Two years later, consistent findings from the U.S. Department of Education's Office for Civil Rights (USDOE OCR) (2016) showed that preschool children with challenging behavior were often suspended or expelled from their programs, and exclusionary procedures disproportionately impacted children of color, especially Black boys. Despite the need for a multi-tiered system of support (MTSS) like the PM, not all states and early childhood programs have fully implemented and sustained the implementation of the model to fidelity.

**Local Context**

The preschool program in this study received the federal Preschool Development Grant funding award in 2015. At its inception, the program operated as a federally funded preschool program and functioned as a partnership between the local public school district and the local Head Start agency. The program was funded during the first few years of operation to serve only children from families living in poverty according to the federal poverty guidelines. In the project's first year, the program delivered a full-day (six-hour) preschool experience to approximately 165 four-year-old preschool students across 11 classrooms. In the project's second year, the program increased in size and scope to serve 236 children distributed across 16 classrooms at five different locations. The program exhibited diverse enrollment, predominantly composed of Hispanic children (57% Hispanic/Latino, 25% White, 8% Asian, 7.2% two or more races, 2% African American, and 0.8% American Indian/Alaska Native).

Each preschool classroom was led by a lead teacher with a minimum of a bachelor's degree and a full-time highly qualified teacher assistant with either a Child Development Associate Credential and completed the paraprofessional praxis exam or a bachelor's degree. Including preschool children with disabilities was implemented by placing one to three children with Individualized Education Programs in each classroom. The staff included a program supervisor, a social worker, a parent liaison, a special education teacher, a master teacher (serving as a classroom coach), and Head Start family service workers. The program adopted the High Scope Preschool Curriculum and utilized their childhood observation record (COR) assessment tool, named COR Advantage, for child assessment and progress monitoring before switching to Teaching Strategies Gold Assessment the following school year.

In 2016, the preschool program in this study was selected as a demonstration site that would participate in the Pyramid Equity Project (PEP). The PEP was funded by the USDOE

OCR and explicitly designed to install program-wide PM implementation at the selected sites. Program-wide PM implementation started with assessing staff buy-in. Once staff buy-in was determined, program coaches were trained to be reliable in administering the Teaching Pyramid Model Observation Tool (TPOT). Program staff also received extensive PD on the PM training modules. The content of the modules included information about promoting children's success by building relationships and creating supportive environments, social-emotional teaching strategies, and individualized intensive interventions, including determining the meaning of challenging behavior and developing a behavior support plan.

Practice-based coaching (PBC) was implemented as part of the installation of the model to help foster positive nurturing relationships that benefit children, staff, and families. PBC is a collaborative, strengths-based approach designed to improve teachers' implementation of evidence-based practices. It is characterized by ongoing, supportive, and goal-oriented interactions between a coach and a teacher (or teaching team). The ultimate aim is to enhance instructional quality and improve student outcomes. PBC on PM practices focused on explicitly teaching young children social-emotional skills, preventing and supporting children with challenging behavior, and effectively using data for decision-making. TPOT results drove PBC cycles to inform specific action plans for improvement.

The teachers in this study were employed in the program during the PEP and received additional PD over the project's two-year duration. Their PD also included equity and implicit bias training. In the project's first year (2016–2017), the program began with 11 classrooms and expanded in year two to include 16 classrooms serving 236 children. The goal of implementing the PM was to equip preschool personnel with practical strategies, tools, and resources to create positive, nurturing learning environments and respond effectively to children's social-emotional

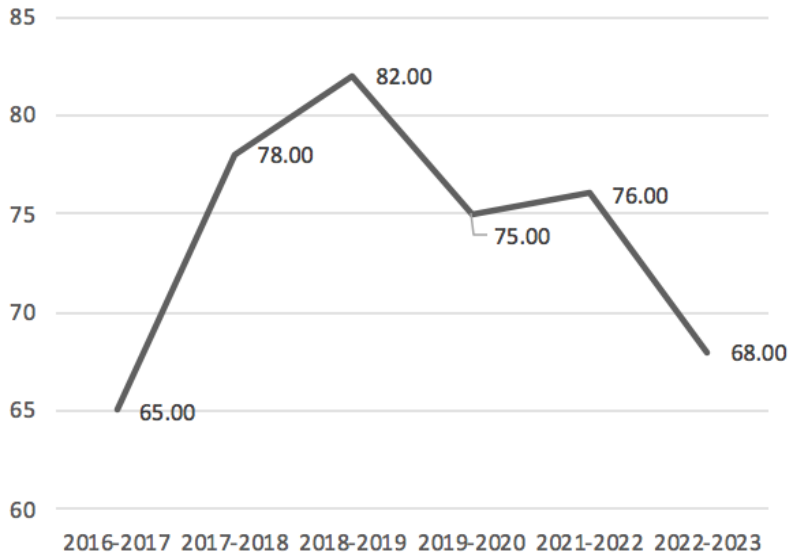
needs.

At the start of the PEP, only a few staff members within this specific preschool program had some knowledge of the PM. However, with the training and technical assistance paired with PBC throughout the PEP, the teachers' collective average of observed and reported social-emotional teaching practices increased from 65% to over 80%, as measured by the TPOT. The TPOT consists of a two-hour in-class observation of teaching practices followed by a 20-minute in-person interview with the teacher, conducted individually by a trained observer. TPOT observers are trained by conducting a full observation alongside a certified reliable trainer. After completing the observation, they score the tool independently and compare results to ensure inter-rater reliability, aiming for alignment within an acceptable range to demonstrate scoring fidelity. This observer training process is repeated at least once every two years to ensure continued observer reliability and to maintain consistency in scoring across time. The TPOT included 14 key teaching practices with 108 skill indicators and 16 red-flag items (see Appendix A). More detailed TPOT information is provided in chapter III.

Prior data evidenced that teachers who were part of the PEP made improvements in their teaching practices and sustained the growth over a few years. However, as shown in Figure 1, upon completing the 2022–2023 school year, the teachers' collective average of observed and reported social-emotional teaching practices fell to 68%, as measured by the TPOT. This indicated a decrease in TPOT scores from previous years and required further examination to understand the factors that contributed to the decline. It is essential to note that the teachers hired before and during the PEP received both formal PM training and PBC, while teachers hired after the conclusion of the PEP received only PBC. Additionally, teachers' responses to challenging behavior and overall implementation experience may vary based on the PD they received.

**Figure 1**

*Program-wide Average of TPOT Scores 2016-2023*




Research on implementing the PM supports that children have better social skills and less problem behavior in PM classrooms, and teachers can implement PM practices better if they receive training and PBC (Hemmeter et al., 2021). Additionally, research supports that early childhood PD is associated with a measurable change in teacher practice, and related child outcomes should be cohesive and sustained over time rather than short, one-off training (Snyder et al., 2022).

Results from Hemmeter et al. (2016) support the positive effects of the classroom-wide model of social, emotional, and behavioral supports on children's social and behavioral outcomes. PM teacher training is an important mechanism to promote evidence-based classroom practices. Additionally, the results support the notion that PM intervention might be even more effective when teachers implement the practices with fidelity**,** which requires training and PBC.

Despite the recognized importance of SEL in early childhood education (ECE) and the efficacy of program-wide PM implementation, a notable gap persists between theoretical understanding and practical implementation within preschool classrooms and programs. While research underscores the significance of cultivating social-emotional competence for children's overall development and academic success, translating these insights into practical, systematic, and sustainable program-wide PM implementation poses challenges. Preschool teachers often face difficulties integrating SEL seamlessly into their daily routines and balancing the diverse needs of children with varying social and behavioral requirements. Practical constraints, such as limited resources and time constraints, impede the seamless incorporation of SEL strategies within the PM framework. Bridging this gap requires a concerted effort supported by early childhood leaders to provide educators with targeted training, ongoing PD, and the necessary resources to effectively implement evidence-based SEL teaching practices within the program-wide PM framework. Previous research on PM implementation is limited in duration and typically spans one to three school years. However, this research will cover five school years and dive deeply into specific aspects of PM implementation and sustainability. Specifically, this study will examine how PD and PBC affect teacher practice over five years as measured by yearly TPOT scores.

## Purpose of the Study and Research Questions

This study aimed to analyze data on PM implementation to examine the impact of PD and PBC on teacher practices over five school years. Specifically, this study explored trends in TPOT scores and teacher survey responses to gain deeper insights into the long-term implementation of the PM. A program implementation evaluation study approach was used, combining quantitative analysis of TPOT data with qualitative insights from a four-question

open-ended teacher survey.

The following research questions guided this study:

1) *Are there differences in teacher practice among teachers who received PM module training and PBC compared to teachers who received only PBC?*
2) *What was the implementation experience of the teachers who received PM module training and PBC compared to teachers who received PBC only?*

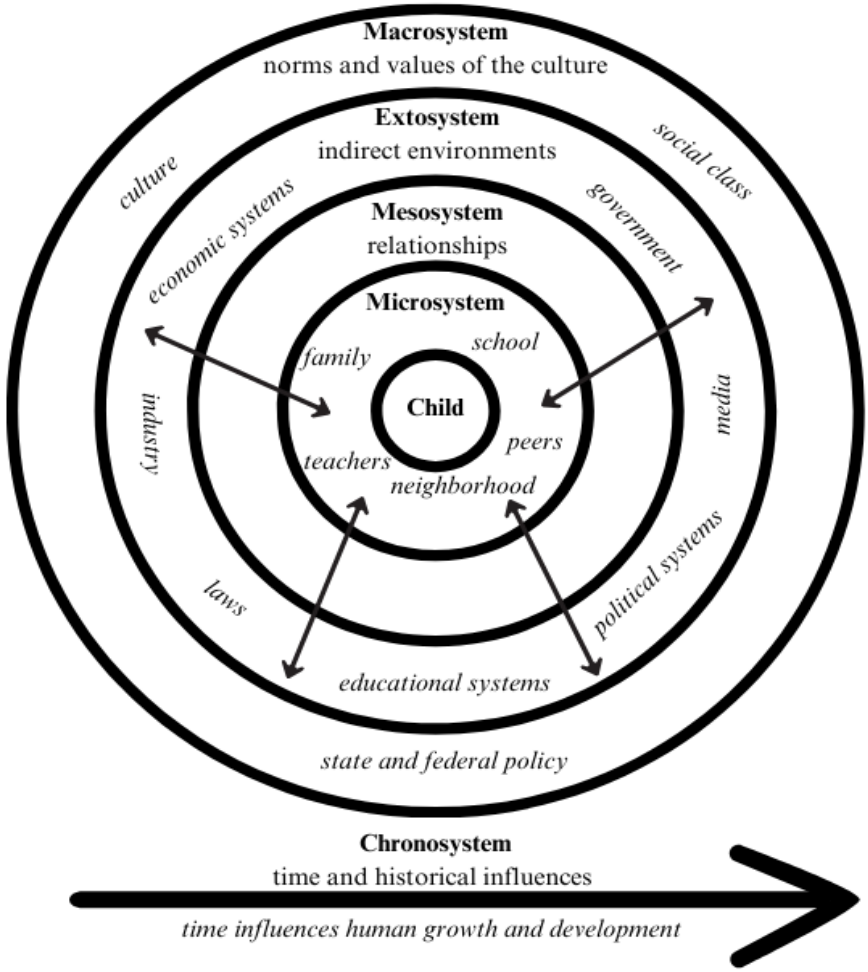
## Conceptual Framework

This study is guided by two conceptual frameworks, which are Ecological Systems Theory (EST) (Bronfenbrenner, 1979) and the Pyramid Model for Promoting Young Children's Social-Emotional Competence (Fox et al., 2003; Hemmeter et al., 2006). Both frameworks acknowledge the complexities and relationships between multiple factors that surround early child development.

EST provides a framework for understanding how multiple environmental layers influence teacher practices and child development. Bronfenbrenner (1979) conceptualized five interconnected systems that shape human development: the microsystem, mesosystem, exosystem, macrosystem, and chronosystem as shown in figure 2. EST frames human development as unfolding within nested, interrelated systems. These layers represent the dynamic interactions between individuals and their environments, ranging from immediate relationships to broader societal influences. EST emphasizes that development can be shaped or constrained by the structure and interplay of these systems, which includes the impact of programs and policies on educational systems that affect all individuals within the system. This framework is especially useful when examining how implementation efforts, such as the Pyramid Model, interact across multiple levels to influence sustainable change.

**Figure 2**

*Bronfenbrenner's Bioecological Model of Human Development*




As a guiding framework, EST informed this study's examination of PM implementation. The theory provided a lens for understanding how environmental systems shape teacher practice, particularly in the context PD and PBC. At the microsystem level, the study focused on how PD directly influenced teacher practices. The mesosystem captures the relationships among teachers, coaches, and administrators. The exosystem considers external factors such as leadership decisions and resource allocation, while the macrosystem reflects societal beliefs and educational policy impacting ECE. These interconnected systems offered a comprehensive view of the conditions influencing teacher practice and, ultimately, child outcomes.

EST shaped the study's research questions. RQ1 explored whether teaching practices varied based on exposure to different PD models, particularly comparing those who received PM module training with PBC to those who received only PBC analyzing the microsystem impact of targeted interventions. RQ2 investigated teachers' lived experiences to examine how mesosystemic and exosystemic factors such as support and implementation barriers influenced the sustainability and effectiveness of PM implementation.

EST and the PM shared a foundational perspective on human development that emphasized the interconnectedness of individuals and their environments. EST demonstrated that individuals are embedded within a series of concentric systems, ranging from the immediate microsystem of family and peers to the broader macrosystem of cultural and societal influences. The PM recognized the significance of social and environmental factors in shaping children's social-emotional development. The PM, specifically designed for early childhood settings, promotes a tiered approach to support children's social-emotional skills. Underscoring the importance of considering multiple layers of influence on a child's development, acknowledging that interactions within families, schools, and communities significantly impact the acquisition of social-emotional competencies. By integrating these perspectives, educators, practitioners, and leaders can cultivate environments that holistically nurture children's emotional well-being and lay the groundwork for positive social interactions to prevent children's challenging behaviors.

The PM was developed by two national, federally funded research and training centers: The Center for the Social and Emotional Foundations for Early Learning (CSEFEL) and the Technical Assistance Center on Social Emotional Intervention for Youth Children (TACSEI). The model describes three tiers of intervention practice: (a) universal promotion for all children, (b) secondary prevention to address the intervention needs for children at risk of social-

emotional delays, and (c) tertiary interventions needed for children with persistent challenges (Fox et al., 2009). As shown below in Figure 3, at the foundation of the model is an effective workforce, which is the foundation for all the practices in the PM (National Center for Pyramid Model Implementation, 2024)

**Figure 3**

*The Pyramid Model for Promoting Young Children's Social-Emotional Competence*


As an evidence-based MTSS, the PM fosters inclusive classrooms, reduces inappropriate discipline practices, and enhances family engagement (Shepley & Grisham-Brown, 2019).

By integrating EST and the PM, this study examines the systemic influences shaping teacher practices and PD models in early childhood education. EST provides a broad perspective on contextual factors, while the PM offers a structured approach to improving instructional strategies. This framework supports the study's investigation of the potential differences in teacher practice following workshop-based PD combined with PBC compared to PBC alone.

## Significance of the Study

Research in early childhood education has indicated that social-emotional competence is critical for children's readiness for school and school adjustment. Preschool teachers encounter young children who demonstrate a wide range of needs and are challenged by how to best support children with significant skill deficits while also providing a developmentally appropriate and supportive learning context for all children. This study aimed to add to the current body of research. It examined the effects of preschool teacher PD on teaching practices and teacher responses to challenging behavior over five school years.

Data from 2016 through 2023 was examined to understand implementation aspects, including teacher practice as measured by TPOT scores. This study explored trends, barriers, and successes and offered suggestions for sustaining and strengthening implementation. Understanding the factors encompassing program-wide PM implementation may assist program leaders in action planning, developing multi-year PD plans, and informing needs for future products to support long-term implementation. More longitudinal studies on PM implementation are needed. This program implementation evaluation study examined quantitative and qualitative data to document the implementation journey and better understand the teachers' implementation experience. This study utilized implementation science, which is embedded in the model, and reviewed data to inform decision-making.

## Equity, Fairness, and Social Justice

The intersection of EST and the PM in early childhood education is deeply connected to equity, fairness, and social justice. Both frameworks emphasize the significance of diverse social contexts and the systemic inequities that impact children's social-emotional well-being. A central issue in ECE programs is that children enter early learning environments with varied experiences, and inclusive education must actively work to eliminate disparities in access to

resources and opportunities. Integrating a social justice lens allows educators to foster equitable learning environments that empower all children to thrive emotionally and socially.

Systemic disparities in ECE are often shaped by race, gender, and socioeconomic class (Lloyd et al., 2021). Historical inequities, rooted in colonial and racialized systems of power, continue to influence policies and perceptions of child-rearing (Lloyd et al., 2021). Data from the USDOE OCR highlight significant racial and gender disparities in preschool discipline. For example, during the 2013–2014 school year, Black preschool children were 3.6 times more likely than their white peers to receive out-of-school suspensions, and Black girls represented 20% of female preschool enrollment but accounted for 54% of all female preschool suspensions (U.S. Department of Education, 2016). In response, the U.S. Departments of Education and Health and Human Services (2014) issued a policy statement urging states and local programs to reduce exclusionary discipline through positive behavior interventions, culturally responsive teaching, and workforce training. The PM was identified as a practical framework to promote social competence and prevent suspensions and expulsions in early learning settings (Fox et al., 2003; Hemmeter et al., 2006).

Culturally responsive leadership plays a critical role in advancing equity in ECE. Khalifa (2018) argued that educational leaders reproduce or contest systemic oppression and must take active steps to disrupt inequities. Similarly, Fuller and Templeton (2019) emphasized that children who enter school without well-developed executive function and fine motor skills face more significant achievement gaps, necessitating intentional leadership strategies to support early learning and professional capacity building. Culturally responsive leadership and the PM align in their commitment to inclusivity, positive behavioral support, and tailored interventions that respect diverse backgrounds. Leaders who support these practices ensure that all children,

regardless of socioeconomic status or race, receive equitable opportunities for social-emotional development in a safe and affirming learning environment.

Increasing equity in ECE requires continuous self-reflection and advocacy (Lowery et al., 2019). Social justice-oriented school leadership demands critical analysis of power structures at multiple levels—local, state, national, and global (Lowery et al., 2019). Leaders must challenge biases, recognize privilege, and actively disrupt structural inequities to ensure access to high-quality, inclusive ECE programs. When implemented with a culturally responsive approach, the PM strengthens these efforts by addressing social-emotional needs in a way that acknowledges and respects children's diverse lived experiences. By fostering inclusive policies and evidence-based practices, culturally responsive leadership within PM implementation can create meaningful, equitable learning experiences that prevent exclusion and promote success for all young learners.

## Definition of Terms

*Challenging Behavior.* ¨Any repeated pattern of behavior, or perception of behavior, that interferes with or is at risk of interfering with the child's optimal learning or engagement in pro-social interactions with peers and adults¨ (Smith & Fox, 2003, p. 6).

*Multi-tiered System of Support (MTSS).* A systematic prevention, promotion, and intervention approach of organizing evidence-based interventions to achieve prevention goals and outcomes.

*Social-Emotional Learning (SEL).* is the process of learning and applying social-emotional skills.

*Teaching Practices*. specific statements of the actions or behaviors of a teacher that involve manipulating the environment to support child adaptation, competence, and/ or

learning.

*Teaching Pyramid Observation Tool (TPOT).* An assessment instrument designed to measure a preschool teacher's implementation of PM teaching practices based on a 2-hour in-class observation followed by a short teacher interview.

*Practice-Based Coaching (PBC).* A cyclical process for supporting preschool teachers' use of effective teaching practices that lead to positive child outcomes.

*Preschool.* Group educational setting for children ages three to five years old who have not yet begun kindergarten.

*Professional Development (PD).* Structured professional learning that results in changes to teacher practices and improvements in student outcomes.

*Pyramid Model (PM).* A multi-tiered framework of evidence-based teaching practices to support young children's social-emotional competence and address challenging behavior.

## Summary

Preschool teachers encounter children with varying social and behavioral needs. They are challenged by how to support children with significant social, emotional, and behavioral needs while also providing a developmentally appropriate and supportive learning context for all children. Several studies support the idea that preschool teachers benefit from PD, including training and PBC on evidence-based practices to teach social and emotional skills in the classroom. However, the degree to which training and PBC affect teacher practice and teacher response to challenging behavior over time is unclear. The study examines the influence of preschool teacher PD formats (training and PBC vs. PBC only) on teacher practice measured by the TPOT and teacher responses to an open-ended survey to understand PM implementation over multiple school years.

# CHAPTER II

# LITERATURE REVIEW

Preschool teachers work with children with diverse social and behavioral needs, including those with significant challenges. Balancing the demands of supporting these children while maintaining a developmentally appropriate and inclusive learning environment for all students can be difficult. Research has shown that professional development (PD), including targeted training and practice-based coaching (PBC), can help teachers implement evidence-based strategies to promote social and emotional learning in the classroom and reduce challenging behavior. Chapter II presents the conceptual frameworks that inform this study and provides a review of the literature related to preschoolers' challenging behaviors, teacher training in Pyramid Model (PM) practices, the role of PBC, and the implementation of multi-tiered systems of support (MTSS).

The literature review below provides a comprehensive overview of the existing knowledge and research surrounding the PM and its implementation in preschool settings. It focuses on promoting young children's social-emotional competence and preventing and addressing challenging behaviors. It articulates the conceptual framework guiding the study, drawing heavily on the PM's tiered intervention approach, which is rooted in evidence-based practices. This framework underpins the systematic delivery of social-emotional teaching and behavior management strategies across universal, targeted, and intensive levels of intervention.

This review details the significance of training preschool teachers in PM practices, highlighting how PD, including PBC, enhances teachers' ability to implement these practices with fidelity. The literature cited underscores the positive impact of such training and coaching on children's social skills, behavioral outcomes, and overall classroom climate. It also explores

the challenges and nuances of translating theory into practice, acknowledging the complexities of implementing such a comprehensive model in diverse educational settings.

Moreover, the review delves into the broader context of preschool education, emphasizing the critical role of social emotional learning (SEL) in early childhood development. It discusses how SEL skills are foundational to children's success in school and life, arguing the importance of equipping teachers with the knowledge and skills to teach these competencies effectively.

In summary, the literature review sets a solid foundation for the study by situating the PM within the broader early childhood education research field. It justifies the need for the study by identifying gaps in the literature, particularly regarding the long-term implementation and sustainability of the PM. It outlines the theoretical and empirical basis for examining the impact of PD and PBC on preschool teaching practices and outcomes.

**Current Knowledge About Preschool Children's Challenging Behavior**

Challenging behavior is any repeated pattern of behavior that interferes with learning or engagement. Challenging behaviors in young children can present as prolonged tantrums, physical and verbal aggression, disruptive vocal and motor behavior, property destruction, self-injury, noncompliance, and withdrawal. (Powell et al., 2003). However, any discussion regarding challenging behavior in preschool is incomplete without first considering the effects of the social context and the environment surrounding the child. Challenging behavior often occurs because it may be the child's most efficient way of satisfying their wants and needs or avoiding something (Dunlap & Fox, 2011). Challenging behavior persists when children do not demonstrate appropriate skills for communicating their needs and wants. Persistent challenging behavior affirms that the behavior is effective for the child. Therefore, a practical social context and

appropriate environment are essential to teaching children socially appropriate skills to prevent persistent, challenging behavior.

Challenging behaviors in preschool settings may pose a significant barrier to early education access. Previous research has indicated that challenging behavior from some children has resulted in their exclusion from services. Research indicates that approximately 8% of preschool-aged children (3–5 years) exhibit behavioral problems severe enough to warrant a psychiatric diagnosis, which can lead to issues forming peer relationships and lower academic achievement in kindergarten (Gilliam & Shahar, 2006). Behavioral challenges have also been linked to an increased risk of expulsion and suspension, with preschool expulsion rates surpassing those of K–12 students by more than 13 times at the national level. Factors such as large class sizes, a higher proportion of younger preschoolers, and elevated teacher job stress have been identified as predictors of expulsion, emphasizing the need for adequate behavioral support and intervention strategies in early childhood education programs (Gilliam & Shahar, 2006).

Additionally, structural characteristics of preschool environments significantly influence expulsion and suspension rates. Programs within schools or Head Start settings report lower expulsion rates than for-profit childcare centers, likely due to greater access to behavioral support services (Gilliam & Shahar, 2006). Teacher stress and job dissatisfaction also contribute to increased expulsion rates, suggesting that improving teacher well-being could be essential in managing challenging behaviors in preschool classrooms. The research has highlighted the need for interventions to support children and educators in effectively addressing challenging behaviors (Gilliam & Shahar, 2006).

However, there is extensive research that shows children can be taught social-emotional skills, which help promote positive prosocial behavior and reduce challenging behavior in preschool classrooms. Furthermore, SEL skills improve children's school performance, citizenship, health behavior, and future academic and career life (Schonert-Reichl, 2017). Mondi et al. (2022) underscores the importance of PD and suggests that educators would likely benefit from ongoing, systematic PD on typical and atypical child development. They suggest that PD should include (a) information about the causes and prevalence of challenging behaviors in young children, (b) evidence-based strategies for addressing challenging behaviors, (c) culturally sensitive strategies for building positive relationships with children and families, (d) guidance about how to identify and support children with severe needs for emotional and behavioral support; and (e) best practices around suspension and expulsion. The PD's aforementioned components are embedded in the PM framework.

**Pyramid Model Framework**

The PM for Supporting Social-Emotional Competence in Infants and Young Children is designed to promote social-emotional development while preventing and addressing challenging behavior in early childhood settings (Fox & Hemmeter, 2014). It is a tiered intervention approach that includes universal promotion practices for all children, targeted support for at-risk children, and intensive individualized interventions for those with significant social-emotional difficulties. The model is grounded in evidence-based practices that enhance classroom environments, support child engagement, and foster positive social interactions. Research has demonstrated that implementing the Pyramid Model significantly improves children's social skills and reduces challenging behavior, particularly for children with persistent behavioral difficulties (Hemmeter et al., 2013).

A key component of the PM is its emphasis on program-wide implementation, which integrates social-emotional support into early childhood programs such as childcare centers, Head Start, and public preschools (Fox & Hemmeter, 2014). Studies indicate that structured training and coaching for educators enhance implementation fidelity and improve child outcomes. A randomized study conducted in preschool classrooms found that children in classrooms where the PM was implemented exhibited statistically significant decreases in challenging behavior (Hemmeter et al., 2011).

**Current Knowledge About Training Teachers in Pyramid Model Practices**

Research on implementing the PM suggests that children have better social skills and less problem behavior in PM classrooms, and teachers can implement PM practices better if they receive training and PBC (National Center for Pyramid Model Implementation, 2024). Additionally, research supports that early childhood PD is associated with a measurable change in teacher practice, and related child outcomes should be cohesive and sustained over time rather than short, one-off training (Snyder et al., 2022).

Hemmeter et al. (2015) used a multiple probe design to address issues related to the intensity of coaching, maintenance, and generalization of the effects of coaching, as well as teacher reports of satisfaction and feasibility of the intervention. This study was designed to address the issues using a PD intervention that included training and coaching with performance feedback. Three teachers were recruited from a control group that participated in a randomized controlled trial (RCT) conducted by the same research team in the previous school year. Teachers received a two day training on the PM about six months before the study and did not receive any follow-up support. Results indicated that all teachers in this study increased their use of targeted PM teaching practices, establishing a functional relationship. However, it was

impossible to establish a functional relationship regarding the teachers' ability to generalize and maintain practices due to the study's design. Results measuring the impact of teachers' use of PM practices on classroom-wide challenging behavior were mixed. All teachers' TPOT scores increased after they received coaching on specific PM practices.

Hemmeter et al. (2016) conducted a potential efficacy trial using a randomized control design that examined the effects of classroom-wide implementation of PM practices across 40 preschool classrooms; half received PD intervention to support their implementation of PM practices, while the other half were assigned to the control condition. Teachers in the intervention group received 19.5 hours of PM workshop training. They were given various materials for implementing PM practices, and instructions accompanied a demonstration on how to use them. Following the workshops, the teachers in the intervention condition received weekly individualized coaching using a PBC protocol. Action plans were informed by data gathered from classroom observations using the TPOT. At the end of the study, focus groups were conducted with teachers in the intervention group that provided a forum for teachers to share their experiences and perspectives about PD and the impact of the intervention on their teaching, capacity to support their students, and the value of PM practices. Additional measures used in both the intervention and control conditions included the *Classroom Assessment Scoring System (*CLASS), the C-TRF, the *Social Skills Improvement System Rating Scales* (SSIS), and the *Focal Child Observation System* (FCOS).

Results indicated that teachers in the control group made little progress in implementing more PM practices, while teachers in the intervention group made steady progress in implementing PM practices. The differences in implementation between the two groups were statistically significant, with the PM group performing nearly two standard deviations higher

than the comparison group, as measured by the TPOT. Findings using the CLASS showed higher levels of emotional support in intervention classrooms, and teachers scored higher in the behavior management dimension of the CLASS. Child outcome data evidenced that children whose teachers were in the intervention group were rated significantly higher on their social skills than children in control group classrooms. Additionally, children in the intervention group had less challenging behavior reported by their teachers and made more frequent social initiations than those in the control group. The findings indicated that workshop training with individualized coaching could be practical for increasing teachers' implementation of evidence-based practices, and practices associated with a comprehensive social-emotional framework can be implemented with fidelity following PD. Lastly, the study proved that PM practices can promote children's social and behavioral skills effectively.

In subsequent research, Hemmeter et al. (2021) implemented a cluster RCT with random assignment to test the *Program-Wide Supports for Pyramid Model Implementation* (PWS-PMI), which is a systematic approach to supporting early childhood (EC) programs in using PM practices and enhancing children's social-emotional outcomes that are grounded in implementation science. The participants in this study included sixteen programs that were randomly assigned. Eight programs were assigned to the PWS-PMI intervention condition and eight to the business-as-usual condition (BAU). Programs assigned to the BAU control conditions received no support during the study year. Programs assigned to the PWS-PMI condition received a leadership team, coach, teacher, behavior support training, and ongoing support from an external coach. Data were collected at the program, classroom, and child level at baseline and post-intervention conditions. Measures included the S*upporting Program-Wide Implementation Fidelity Inventory*, the *PreSET,* a program and classroom demographic

questionnaire, a discipline questionnaire, the TPOT, the CLASS, and the Social Skills Improvement System.

Hemmeter et al. (2021) stated that the findings were multi-faceted. They found the SPIFI to be a valuable and reliable tool for measuring the fidelity of PSW-PMI. They also found that the intervention, which included training and coaching, effectively supported programs using PWS-PMI. Classroom effects were consistently positive, and child effects were viewed as promising. Results indicated that training and support increased the implementation of program-wide PM practices. The control group did not implement PM practices to the same extent, and the differences between the intervention and control groups were statistically significant. The findings indicated that a program-wide approach is practical and feasible in EC programs. However, more time and support may be needed to sustain high fidelity of implementation and to have more significant effects on children.

**Current Knowledge About Practice-Based Coaching**

Additional research was conducted to identify articles and studies supporting PM implementation through practice-based coaching. Synder et al. (2015) asserted that coaching has been described as an important factor in ensuring the implementation of evidence-based practices. Their article described a coaching framework designed to support EC teachers in implementing evidence-based teaching practices with fidelity. They explained the key components of the PBC framework, provided theoretical and empirical rationales for each component, and described how it was operationalized as a coaching protocol in several studies.

Synder et al. (2015) defined PBC as a cyclical process for supporting preschool teachers in using effective teaching practices that increase positive outcomes for children. The teaching practices discussed are the specific statements of the actions or behaviors of a teacher that

involve altering the physical, temporal, interactional, or instructional environment to support child adoption, competence, or learning. Actions or behaviors are practices that are observable and measurable. PBC differs from other EC coaching models because it explicitly focuses on teaching practices to support teachers' fidelity to implementing evidence-based teaching practices. The key components of PBC include shared goals and action planning, focused observation, and reflection and feedback within a collaborative partnership between the teacher and coach. Synder et al. (2015) defined a *collaborative partnership* as a coach and teacher working together to set goals and identify action steps to support the implementation of selected teaching practices. The PBC framework was operationalized and applied in two experimental design studies aimed at supporting EC teachers in implementing interventions that incorporate explicit teaching practices.

Synder et al. (2015) discussed the outcomes of the two studies. Study 1 focused on 36 teachers' implementation of embedded instruction for children with disabilities and were randomly assigned to one of three PD conditions: (a) 15-hour workshop training plus on-site and remote expert coaching, (b) 15-hour workshop training plus self-coaching with web-mediated support, and (c) business-as-usual PD. Study 2 focused on 40 teachers' implementation of PM practices after they were randomly assigned to one of two PD conditions: (a) 19 ½ hours of workshop training plus on-site, expert coaching, or (b) business-as-usual PD. In both studies, teachers in the PD intervention conditions received resources and materials related to the teaching practices, and the planned dose for coaching was 16 sessions, which included a needs assessment related to the teaching practices that were the focus of the workshop training. Coaches used the assessment data gathered as part of the initial goal-setting and action-planning process with teachers to inform follow-up focused observations, reflection,

and feedback debriefing meetings. Coaches used coaching logs to ensure implementation fidelity.

The findings of the studies showed that the coaching protocol and strategies associated with PBC were generally implemented as intended. Synder et al. (2015) asserted that it is important to measure and report the dose of coaching provided, and researchers should measure the number of sessions and debriefing meetings that occur as well as the length of time spent in observations and debriefing meetings. They concluded by stating that the coaching of teachers is resource intensive, and the differentiation of how and when to deliver support warrants further examination in the context of program-wide and system-wide initiatives.

Fettig and Artman-Meeker (2016) demonstrated that group coaching increased teachers' implementation of PM practices. In this study, six teachers participated in a six-month group coaching model within preschool classrooms that served children in an urban low-income setting. The teachers in this study participated in six two-hour training sessions on PM teaching practices, with two to three weeks between each training session. The group coaching sessions were conducted between each training session during the school day, and a substitute teacher was provided for the classroom teachers to attend the group coaching session.

The specific skills covered included teaching children behavior expectations, social skills and emotional competencies, friendship skills, how to express emotions, and problem-solving. Results demonstrated that the teachers in this study improved their implementation of specific social-emotional teaching practices in their classrooms using the group coaching model. The baseline mean for teaching children behavior expectations was 31%, which improved to 40.5% post-assessment following the last group coaching session. Teaching children social skills and emotional competencies improved from a baseline mean of 37.5% to a mean of

66.7% at post-assessment. Teaching friendship skills improved from a baseline mean of 44.5% to 55.6% post-assessment. Teaching children to express emotions improved from a baseline mean of 41.7% to 66.7% at post-assessment. Lastly, teaching problem-solving increased from a baseline mean of 26% to 50% at post-assessment. Child outcomes were not measured directly in the study, but teachers anecdotally reported that they spent less time addressing challenging behavior, and fewer children demonstrated persistent challenging behavior.

Hamre et al. (2017) examined the critical role of PD in enhancing the effectiveness of preschool teachers, particularly in the context of expanding ECE programs. The authors highlighted the importance of high-quality PD approaches that integrate coursework and coaching to support teaching practices promoting cognitive and social-emotional development in young learners. Their review of research suggested that while well-designed PD initiatives can lead to meaningful changes in teaching practices, large-scale implementation often presents challenges, such as variability in delivery, inadequate support structures, and insufficient alignment with program goals. The authors advocate for evidence-based PD models incorporating targeted, intensive, and sustained coaching to improve instructional quality.

The study further emphasized the significance of PBC as a PD strategy that enhances teacher efficacy by providing ongoing, individualized support. Their findings indicated that while workshop-based PD can offer foundational knowledge, it is less effective in changing teacher behavior without the addition of structured coaching. This aligns with research showing that coaching-based interventions substantially impact teaching practices and student outcomes more than standalone workshops. Hamre et al. (2017) also discussed systemic barriers to effective PD, including inconsistent funding, lack of administrative support, and policy constraints that limit the scalability of high-impact coaching models.

Rojas et al. (2020) suggested that a combination of training and coaching and the use of developmentally appropriate curricula are the key components that produce the most significant improvements in teacher practices, classroom quality, and a range of child outcomes when expanding a PD program. A PD program should target specific teaching practices to improve teaching practices and support gains in children's learning. Furthermore, PD should include didactic instruction (e.g., workshops) with weekly/biweekly support from coaches. Three dimensions of PD program fidelity are (1) *dosage* (an index of the quantity of delivery), (2) *quality* (a measure of the skill with which teachers deliver the material and interact with children), and *content* (the extent to which the PD was delivered as prescribed).

Shannon et al. (2021) stated that PD, including coaching, has demonstrated the ability to affect preschool teachers' use of evidence-based practices. Their study explored how seven coaches facilitated conversations with preschool teachers about an identified set of evidence-based embedded instruction teaching practices within a 15-week PBC partnership. They used video-based direct behavioral observation coding systems to characterize the interactions between coaches and teachers. Data were collected within the first year of a RCT that focused on examining the effects of a PD intervention on preschool teachers' use of embedded instruction teaching practices with preschoolers with disabilities. Forty-four preschool teachers were randomly assigned to one of three conditions: (a) 16 hours of workshops, implementation guides, a web-based multimedia tool kit, plus 1 week of onsite PBC; (b) 16 hours of workshops, implementation guides, and materials, a web-based multimedia tool kit, plus 1 week of web-mediated self-coaching; or (c) district-provided PD. The focus of this study was on the onsite PBC condition.

This study used the *Coaching Practices Observation Tool-Research Version 1*, which is a continuous, timed-event, observational coding system designed to quantify the duration of coaching conversations, the proportion of coach and teacher initiations, and the rate of coach verbal behaviors (Shannon & Snyder, 2016). Results indicated that much of the debriefing meeting time was spent on reflection and feedback (42.7%), followed by goal setting and action planning (33.6%) (Shannon et al., 2021). This aligns with two PBC framework components (Snyder et al., 2015). Coaches and teachers also spent a small portion of time in personal/pleasantries (1.2%) on each occasion, suggesting building rapport and briefly sharing non-classroom-related interests as part of their collaborative partnership (Shannon et al., 2021). Results from this study provided further evidence that coaches can implement the PBC framework as intended when provided with a structured protocol and initial training combined with ongoing support and performance-based feedback.

There is additional evidence that pairing training with PBC yields better outcomes. For example, Kranski and Steed (2022) conducted an experiential analysis of a workshop plus PBC to enhance four EC teachers' use of culturally responsive practices. Their study showed a functional relationship established between the intervention and practices for three of the four teachers. Descriptive findings suggested that certain culturally responsive teaching practices were implemented at higher rates than others. School staff viewed the workshop's goals, processes, outcomes, and PBC positively. Their findings align with previous research suggesting that pairing workshops with PBC is associated with improvements in preschool teaching practices. However, some teachers may require further individualization or more PBC sessions to improve their teaching practice.

Golden et al. (2021) conducted a multiple baseline study with three teachers to evaluate the effectiveness of a coaching package, training plus PBC, implemented through text message (Training + Text-PBC), on teachers' implementation of targeted PM practices. In this study, the coach watched observations recorded by the teacher using Zoom and engaged the teacher in coaching conversations that included supportive and constructive feedback from the coach as well as prompts for the teacher to engage in reflection about their use of the practices through text messages that were delivered directly to the teacher's cell phone. The three teachers received an average of 72 minutes of PM overview training prior to baseline data collection. During the training, coaches also reviewed procedures for observations. At the end of the training, teachers reviewed the implementation checklist and, with their coach, selected four practices to target during coaching and the primary and secondary parts of the daily routine during which 15-minute observations would occur. Information on the dosage of coaching was collected.

After the study, the teachers completed a 10-item survey and rated the text message coaching with the daily reflection component as highly effective. The study demonstrated a functional relation between Training + Text-PBC and increased PM practice implementation for all three participants. The implementation of PM practices was maintained following the withdrawal of the intervention and was generalized across parts of the daily routine. Teachers increased their use of each of the targeted PM practices with an average of 34 minutes of training and 81.6 minutes of coaching, which provided evidence that Text-PBC is efficient for coaching teachers on implementing PM practices and extended the evidence of the effectiveness of PBC (Golden et al., 2021).

**Current Knowledge About Multi-Tiered System of Support**

MTSS are frameworks in which the first or universal tier (Tier 1) includes practices and strategies for the whole group. The second or targeted tier (Tier 2) includes practices and strategies for smaller subsets of the whole group that may need more support and intervention, as they may be at risk for delays or concerns. The third or individualized tier (Tier 3) includes practices, strategies, and processes for an even smaller subset of the group that requires intensive individualized intervention. Several research studies have examined the use of MTSS and are included below.

Fox et al. (2011) conducted a single-subject study examining training, coaching, and implementation of PM MTSS in preschool settings. The study focused on three preschool classrooms, and the participants included three early childhood special education teachers who taught in an inclusive public preschool setting located on an elementary school campus. The teachers participated in a three-day (18-hour) training workshop on PM teaching practices followed by coaching sessions and observations twice weekly. Coaching focused on increasing the implementation of PM teaching practices to fidelity. Researchers demonstrated a functional relationship between workshop training and coaching in implementing PM teaching practices.

The specific social skill instruction included teaching children behavior expectations, social skills and emotional competencies, friendship skills, how to express emotions, and problem-solving. Teacher A's baseline score was a mean of 31% implementation of the social and emotional indicators, a mean of 29% during the coaching phase, and increased to a mean of 61% during follow-up. Teacher B had a baseline score of 13% implementation of the social and emotional indicators, a mean of 41% during the coaching phase, and increased to a mean of 63% during the follow-up. Teacher C started with a mean of 3% and improved to 32% during the coaching phase of the intervention. However, Teacher C did not complete the follow-up

assessments. This study measured teaching practices, however, child outcomes were not collected.

Stanton-Chapman et al. (2016) conducted a study in 10 Head Start classrooms to evaluate the effectiveness of MTSS. Classrooms in this study implemented Tier 1 and Tier 2 strategies, and two classrooms had children with individual needs, thus implementing Tier 3 interventions. Different from other MTSS studies, this study implemented a shortened version of each tier while simultaneously including a problem-solving model at each tier intended to improve classroom routines and individual child concerns. A one to two long hour workshop training was explicitly delivered for each tier, followed by consulting for each tier to support implementation to fidelity.

Tier 2 strategies included initiating with peers, responding to peer verbalizations, using your friend's name to gain attention, and taking turns in play or conversations. Child outcome data were collected for children who received Tier 2 (n=9) or Tier 3 (n=2) support.

**The Impact of the COVID-19 Pandemic**

The COVID-19 pandemic disrupted education systems worldwide, leading to widespread school closures, transitions to virtual learning, and exacerbating existing educational inequities. Hoofman and Secord (2021) highlighted that while the rapid shift to online instruction was necessary to curb the spread of the virus, it disproportionately affected students from marginalized communities, including those with special education needs, English language learners, and students from low-income households. The shift to remote learning widened the academic achievement gap. It led to decreased social-emotional well-being, mental health, and access to essential school-based resources such as meals and healthcare. These disparities were further exacerbated for students who relied heavily on structured learning environments and

additional educational support services.

Beyond academics, the pandemic had severe implications for student well-being. Hoofman and Secord (2021) reported that children faced increased rates of anxiety, depression, and social isolation due to prolonged school closures and the loss of in-person peer interactions. Furthermore, special education students were among the hardest hit by the transition to remote learning. Hoofman and Secord (2021) discuss how children with autism, ADHD, and other learning disabilities struggle with the lack of individualized instruction and therapeutic interventions.

The findings from Hoofman and Secord (2021) underscored the urgent need for targeted interventions to mitigate the long-term effects of COVID-19 on education. Their work suggests that many students, particularly those from disadvantaged backgrounds, experienced lasting setbacks.

In addition to its effects on broader educational systems, the COVID-19 pandemic profoundly affected PK–12 educators. According to LaTronica-Herb and Karalis Noel (2023), teachers faced personal and professional stressors that contributed to heightened burnout and an increased likelihood of attrition.

The study identified self-efficacy, work-life balance, health and safety concerns, and secondary trauma as significant personal stressors. Many teachers reported declining professional confidence due to job ambiguity, inadequate preparation for remote instruction, and the additional burden of monitoring student well-being. Burnout levels surged as teachers juggled increased workloads and blurred boundaries between personal and professional responsibilities (e.g., caring for their children while teaching remotely). Additionally, health and safety concerns were a significant factor in teacher stress and early retirement, particularly

among veteran educators. Teachers with a heightened perception of personal health risks were significantly more likely to consider leaving the profession.

Teachers were often required to adapt rapidly to new instructional formats without the necessary training or resources. Many struggled with increased workload, shifting roles, and lack of administrative and community support. The move to virtual and hybrid learning environments created high-stress levels, especially for those who lacked prior experience with digital instruction. Research in the study found that by the end of 2021, 25% of teachers considered leaving their positions, a notable increase from the pre-pandemic rate of 17%. Additionally, new teachers entering the profession were less prepared due to disruptions in their practicum experiences, leading to a higher likelihood of attrition in early career stages.

The study found that mental health challenges among teachers increased dramatically during the pandemic, with many experiencing anxiety, depression, and symptoms of secondary trauma due to their heightened role in supporting students through crises. Teachers reported a lack of institutional support, contributing to feelings of professional inadequacy and dissatisfaction. Minority teachers and those working in under-resourced schools faced more significant challenges, with many experiencing compounded stress from both COVID-19 and broader systemic inequities.

To mitigate the long-term effects of the pandemic, LaTronica-Herb and Karalis Noel (2023) recommended several strategic interventions, including increased administrative support (clear policies, workload adjustments, and enhanced communication), improved professional agency (giving teachers more control over instructional decisions), work-life balance initiatives (reduced workloads, smaller class sizes, and psychological support), and technical training opportunities. The study emphasized the need for long-term systemic changes to support teacher

well-being and professional sustainability.

## Summary

A practical social context within an appropriate environment led by skilled teachers is essential to teaching young children social and emotional skills to prevent challenging behavior and promote prosocial skills in preschool classrooms. The conceptual frameworks discussed and the studies reviewed in this chapter provide evidence that preschool teachers can provide social-emotional skill instruction and promote prosocial behavior in young children within systems that support PD for teachers. The next chapter will describe this program implementation evaluation study approach using quantitative and qualitative data as well as explain the study's purpose, design, and description to address the research questions.

# CHAPTER III

# METHODS

## Research Design Overview

This study examined the implementation of the Pyramid Model (PM) in a public preschool program over five years, focusing on the impact of professional development (PD) and practice-based coaching (PBC) on teacher practices. The study analyzed Teaching Pyramid Model Observation Tool (TPOT) scores to measure implementation fidelity and teacher survey responses to capture teachers' experiences. By exploring trends in PM implementation, the study sought to determine whether PD and PBC improved teacher practices over time. To carry out this study, a program implementation evaluation study was employed by using quantitative and qualitative data. This design gathered quantitative data, archival TPOT scores, and qualitative data, open-ended teacher surveys, to provide a comprehensive understanding of implementation allowing for new insights and new ways to understand the data associated with PM implementation over time. The rationale for selecting this approach was that the quantitative data provided general information related to the research questions, and the qualitative data helped explain and give meaning to the quantitative data (Creswell & Gutterman, 2019).

## Study Setting and Participants

In 2016, the preschool program in this study was selected to participate in the federally funded Pyramid Equity Project (PEP). The program was selected to participate in the project designed to install program-wide PM implementation. As part of the project, program staff received extensive PD and PBC to help foster positive nurturing relationships to benefit children, staff, and families, how to explicitly teach young children social-emotional skills, how to prevent and support children with challenging behavior, and how to effectively use data for

decision making. In the project's first year, the program began with 11 classrooms and then expanded implementation in year two to include 16 classrooms serving 236 children. This study was conducted using data collected from 2016 through 2023.

Participants in this study included a sample of preschool teachers (n = 20) employed in the program. The 20 teachers selected work in classrooms within the public preschool program selected for this study. Half of the teachers (10 teachers) have been employed by the program since 2016 and received PM training and PBC as part of the PEP. The remaining 10 teachers were hired after completing the PEP and received only PBC. The participant demographic and background information are summarized in table 1.

**Table 1**

*Participant Demographic and Background Information*

| Demographic | Subgroup | Group 1 (N = 10) | Group 2 (N = 10) |
|---|---|---|---|
| Age | 25-29 | 0 | 1 |
| | 30-39 | 5 | 3 |
| | 40-49 | 2 | 2 |
| | 50-59 | 3 | 4 |
| Gender | Female | 10 | 10 |
| Ethnicity | Hispanic or Latino | 3 | 3 |
| | Not Hispanic or Latino | 7 | 7 |
| Race | Pacific Islander | 1 | 0 |
| | White | 9 | 10 |
| Highest Academic Degree | Bachelor | 4 | 6 |
| | Master | 6 | 4 |
| Years of Teaching Experience | 6-9 years | 5 | 3 |
| | 10-14 years | 3 | 4 |
| | 15 or more years | 2 | 3 |

All of the teacher participants are female and vary in experience and education. Teachers selected range from first-year teachers to those with over 30 years of teaching experience in preschool and have educational backgrounds ranging from bachelor's to master's degrees. The teachers in Group 1, who received PM training and PBC, had a range of experience from first-year teachers to teachers with 22 years of experience. The average experience for Group 1 was seven years. The teachers in Group 2 who only received PBC had a range of experience from first-year teachers to those with 33 years of experience, averaging 10.8 years of experience.

## Instruments and Data Collection Procedures

Quantitative and qualitative data were collected through the utilization of two instruments within the program implementation evaluation study design. Historical TPOT scores were the quantitative data used to understand teacher practice, and qualitative data were collected using the open-ended teacher survey to understand the teachers' implementation experience.

### Teaching Pyramid Observation Tool

To answer the first research question, TPOT data were used. The TPOT is an observation tool designed to measure a preschool teacher's implementation of PM teaching practices. Administering the TPOT requires a two-hour in-class observation of teaching practices and a 15–20-minute interview with the teacher conducted by a trained observer. TPOT observers are trained by conducting a full observation alongside a certified reliable trainer. After completing the observation, they score the tool independently and compare results to ensure inter-rater reliability, aiming for alignment within an acceptable range to demonstrate scoring fidelity. This process of training observers is repeated at least once every two years to ensure continued observer reliability and maintain consistency in scoring across time. The

administration of the TPOT measures a preschool teacher's implementation of PM teaching practices, which includes specific indicators that measure the explicit instruction of social, emotional, and behavioral skills.

The TPOT includes 14 key teaching practices and a total of 108 skill indicators, 16 red flag items, seven indicators regarding environmental arrangement, and multiple indicators if challenging behaviors are observed during the assessment. Indicators are scored as “yes” or “no” by a trained observer, with “yes” indicating that the specific teaching practice was used and observed in the classroom, and “no” indicating that the practice was not observed during the session. For each key teaching practice, the indicators associated with the specific teaching practice are listed by difficulty, with the first indicators measuring basic strategies and progressing to more challenging strategies.

The observer scores the first eight of 14 key teaching practices during the classroom observation. The following three key teaching practices were scored using observation and interview responses. The last three key teaching practices were scored according to the interview responses. If the key teaching practices scored were not observed or reported, the item is marked “no”.

For this study, all 14 Key Teaching Practices were examined. The 14 Key Teaching Practices include: (a) Schedules, Routines, Activities; (b) Transitions; (c) Supportive Conversations; (d) Promoting Children's Engagement; (e) Providing Directions; (f) Collaborative Teaming; (g) Teaching Behavior Expectations; (h) Teaching Social Skills and Emotional Competencies; (i) Teaching Friendship Skills; (j) Teaching Children to Express Emotions; (k) Teaching Problem Solving; (l) Interventions for Children with Persistent Challenging Behavior; (m) Connecting with Families; and (n) Supporting Families Use of

Pyramid Model Practices. The first eight key teaching practices listed above were scored by observation only and marked "yes" if the trained observer witnessed the teacher demonstrating the specific teaching practices. The following three key teaching practices (Teaching Friendship Skills, Teaching Children to Express Emotions, and Teaching Problem Solving) were scored by observation and/or interview, with any observed behaviors superseding what teachers report during the interview. If the trained observer witnessed the use of the teaching practice during the observation, then the indicator is marked "yes" on the TPOT score sheet. If the indicator is not observed during the TPOT observation, but the teacher described using the teaching practice during the interview, the observer marked "yes" for that indicator. If the observed behavior contradicts what is reported by the teacher during the interview, then the item is scored based on what is observed. The implementation of the 108 indicators from the TPOT will be examined and included in data analysis.

**Open-Ended Teacher Survey**

To answer the second research question, qualitative data were collected through an anonymous five-question open-ended electronic survey in Google Forms. The five questions were as follows:

1. How has PM training impacted your teaching practice and response to challenging behavior?
2. How has PBC impacted your teaching practice and response to challenging behavior?
3. What are the challenges, if any, that you have experienced in PM implementation?
4. What support, if any, do you need in going forward implementing the PM in your classroom?
5. Please include anything else that you would like to share regarding the PM and

implementation in your classroom and/or the overall program.

The goal of the five-question, open-ended survey was to identify common themes and better understand the teacher's implementation experience. The teachers' responses helped determine the next steps for training and overall PM implementation. The database for the current study included archival TPOT scores and teacher survey responses.

## Data Analysis

This study used a program implementation evaluation study approach to collect and analyze quantitative and qualitative data to help make sense of the results. Inductive thematic analysis was employed to discover emerging themes, expanding upon the qualitative data that was gathered through the responses from the open-ended teacher questionnaires.

### Quantitative Data Analysis

The TPOT scores served as a primary quantitative measure to assess the fidelity of teachers' PM implementation. The TPOT data, encompassing 108 indicators across 14 key teaching practices, were analyzed for teachers who received both PM module training and PBC versus those who received only PBC.

A nonparametric test, known as the Mann-Whitney U-test, was employed to determine if significant differences existed between the two groups' TPOT scores over time. The analysis helped determine if PD in the form of PM training, in addition to PBC, led to higher fidelity in implementing PM practices compared to PBC alone.

### Qualitative Data Analysis

Qualitative data from an open-ended teacher questionnaire were analyzed to supplement and provide context to the quantitative findings. Inductive thematic analysis was employed to explore teachers' experiences with PM implementation, the impact of PD on their teaching

practices, and their perceptions of the challenges and supports needed for effective PM implementation. Responses were coded to identify common themes related to PD's effectiveness, implementation challenges, and perceived impacts on student behavior and classroom climate.

### Integration of Quantitative and Qualitative Findings

Integrating quantitative and qualitative data offered a holistic view of PM implementation's effectiveness. While TPOT analyses quantitatively measured the influence of PD on teaching practices, the qualitative insights from teacher surveys highlighted the practical experiences, challenges, and supports that influenced the fidelity and sustainability of PM implementation. This program implementation evaluation study approach using quantitative and qualitative data provided a nuanced understanding of how PD—specifically the combination of PM training and PBC—influenced teacher practices and preschool children's social-emotional outcomes.

## Ethical Considerations and the Role of the Researcher

Throughout this study, the researcher played the role of both researcher and facilitator. The experiences have influenced the researcher's perspective on how these roles should be effectively implemented regarding PM implementation and preschool education in general. The researcher was a White, cisgender, and heterosexual female preschool principal, and her positionality comes with its own set of assumptions and biases. The researcher was also a former preschool teacher, preschool intervention and referral specialist, preschool instructional coach, and assistant principal. In the researcher's previous positions, she implemented PM practices in her classroom and then coached fellow teachers using the TPOT and PBC. During the researcher's tenure as a preschool intervention and referral specialist, she was trained directly by the PM developers over two years during the PEP. As a result, the researcher had the opportunity

to observe best practices, coach teachers, and participate in and deliver PD in PM practices, social-emotional learning (SEL), and using data for decision-making. Using reflective practice and Harvard's Implicit Bias Tool, the researcher has been able to reflect upon her biases and assumptions to reduce any unintentional interpretations of data or views about overall PM implementation. Additionally, collaborating coaches collected TPOT data and coded scoresheets to preserve confidentiality.

The researcher's background also influences her role as a researcher and facilitator. The researcher has an undergraduate degree in psychology and has previously worked on various forms of research, which has given her an understanding of biases and research. To remedy any potential biases, the researcher utilized a program implementation evaluation study approach, used historical data from multiple trained observers, and worked with collaborators to review the data for trends and findings to help triangulate the data in the study to improve reliability and validity.

Initial data collection for this research was conducted during the PEP, and the school district granted permission to participate in the project. Before starting the PEP, teachers were surveyed to determine buy-in, and survey responses were needed to demonstrate that at least 80% of staff were interested in moving forward with PM implementation. Baseline data collection began after the level of buy-in was determined. Teachers were informed of their right to privacy, and that participation would not impact their employee observations. Data were coded, and strict measures were taken to avoid teacher identification. The right to privacy was strictly adhered to, and measures were taken to ensure that all information received would remain anonymous and confidential. The measures taken to ensure a right to privacy for all involved have been maintained throughout the study.

# CHAPTER IV

# RESULTS

## Introduction to Data Analysis

This chapter presents the results of the longitudinal data analysis to answer the study's research questions. Quantitative data, derived from an archival dataset of TPOT scores spanning 2018–2019 through 2022–2023, were analyzed alongside qualitative data from an open-ended teacher survey to examine the impact of PM training and PBC on teaching practices and to understand teachers' implementation experiences. This program implementation evaluation study using quantitative and qualitative data investigated potential differences in teacher practices between teachers who received both PM training and PBC and those who received PBC only. Additionally, the study examined if there were trends in teacher practice within each group over five years.

### Selection of Analysis Methods

The study utilized descriptive statistics (frequency, mean, and standard deviation) and inferential statistics, Mann-Whitney U-test, to determine if significant differences existed between the two groups over time to answer the first research question. This method was chosen due to the small sample ($N<30$) and its suitability for analyzing data collected at multiple time points from the same subjects. This helps understand the impact of PM training and PBC on teacher practices.

The second research question was addressed through the utilization of *thematic analysis*, which is defined as "a method for identifying, analyzing, and reporting patterns (themes) within data" (Braun & Clarke, 2006, p. 79). This method is appropriate for exploring patterns across qualitative data from participants and researchers. More specifically, inductive thematic analysis

was used, as the themes identified are strongly linked to the data. It is a process of coding the data without fitting it into a preexisting coding frame or the researcher's analytic preconceptions (Patton, 1990). The research questions, data sources, and data analysis methods are summarized in Table 2.

**Table 2**

*Alignment of Research Questions, Data Sources, and Analysis Methods*

| Research Questions | Data Source | Data Analysis Methods |
|---|---|---|
| Are there differences in teacher practice among teachers who received PM module training and PBC compared to teachers who received only PBC? | TPOT Scores | Descriptive statistics:<br>● Frequency<br>● Mean<br>Inferential statistics:<br>● Mann-Whitney U-test |
| What was the implementation experience of the teachers who received PM module training and PBC compared to teachers who received PBC only? | Teacher Survey | Inductive thematic analysis |

**Data Preparation**

Data preparation involved several steps to ensure the datasets were clean and suitable for analysis. The archival TPOT data were stored by school year on separate Microsoft Excel Workbooks. TPOT data were collected for each teacher for every year included in the study. The data were copied from the workbooks set up by year and then compiled into one Google Sheet, which included the data for all of the teachers in the study over the five years. Data were copied, checked, and re-checked against the original workbooks to ensure accuracy.

In addition, IBM SPSS Version 26 was used for inferential statistical analysis due to its robust capabilities in handling complex statistical tests and its widespread acceptance in educational research. The raw data from the Google Sheet was then entered into an SPSS file to run the Mann-Whitney U-test to compare the possible differences between Group 1 and Group

2 over the five years.

Data from the teacher questionnaire was gathered using two separate Google Forms. One Google Form was shared with all of the teachers in the PM training and PBC group, and a separate form was shared with the PBC-only group. Data from each form was captured in two separate Google Sheets and then copied into one Google Sheet to be used to examine themes.

### Data Coding and Organization

The data were organized into two main groups: teachers who received both PM module training and PBC (Group 1) and teachers who received only PBC (Group 2). Within the groups, data were collected across five school years: 2018-2019, 2019-2020, 2021-2022, and 2022-2023. Data were not collected during the 2020-2021 school year due to school closures caused by the COVID-19 pandemic. The qualitative data from the open-ended surveys was coded thematically to identify common themes and insights into the teachers' implementation experiences.

## Presentation of the Findings

Descriptive statistics were calculated for TPOT scores. Means and standard deviations were calculated for TPOT summative scores and the average of each key practice for both groups of teachers.

### Research Question 1

*Are there differences in teacher practice among teachers who received PM module training and PBC compared to teachers who received only PBC?*

TPOT data were analyzed to address the research question regarding differences in teacher practice among teachers who received the PM module training and PBC compared to teachers who received only PBC. This helped determine how teacher practice, measured by the

TPOT, differs between the two groups over the five academic years. Teachers who received PM module training and PBC are called Group 1. Teachers who received only PBC were Group 2.

The TPOT data were segmented into the 14 key practice items and averaged across five academic years (2018–2023). However, data were not collected for the 2020-2021 school year due to school closures for the COVID-19 pandemic. The key practice items include (a) Schedules, Routines, and Activities; (b) Transitions; (c) Supportive Conversations; (d) Student Engagement; (e) Providing Directions; (f) Collaborative Teaming; (g) Behavior Expectations; (h) Social-Emotional Skills; (i) Friendship Skills; (j) Emotion Expression; (k) Problem-Solving; (l) Interventions; (m) Connecting with Families; and (n) Family Use of PM.

Teachers can receive a score from 0–100 for each key practice item. A score of 80 or higher indicates fidelity in the practice. Table 3 shows the Average of TPOT key practice scores by year and by group. As shown, teachers in Group 1 received mean scores of 83.33, 82.46, 72.81, and 68.86, compared to teachers in Group 2, who received mean scores of 74.86, 68.86, 68.42, and 67.02, respectively.

**Table 3**

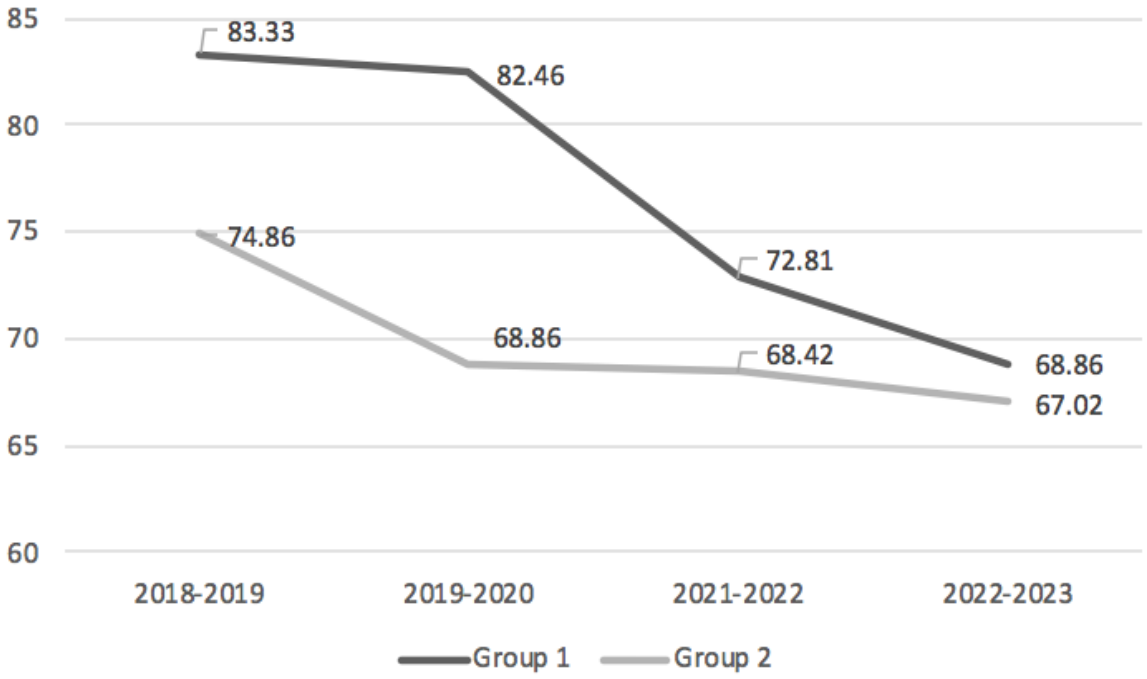
*Mean Scores by Group and by Year for TPOT Summative Scores*

| School Year | Group 1 PD + PBC Group (n=10) | Group 2 PBC Only Group (n=10) | *p* value |
|---|---|---|---|
| 2018–2019 | 83.33 | 74.86 | .093 |
| 2019–2020 | 82.46 | 68.86 | .001 |
| 2021–2022 | 72.81 | 68.42 | .529 |
| 2022–2023 | 68.86 | 67.02 | .912 |
| Average | 76.86 | 69.79 | *.971* |

As evidenced in Table 3, Group 1 generally showed higher average scores in key practice items than Group 2 over the four academic years. Both groups displayed a decreasing trend, as shown in figure 4, in average scores over time, with Group 1's scores declining more sharply than Group 2. In 2018–2019 and 2019–2020, Group 1 outperformed Group 2. The gap between the groups narrowed in 2021–2022 and 2022–2023, but Group 1 still maintained slightly higher scores.

**Figure 4**

*Average of TPOT Key Practice Scores by Year and by Group*




On average, across four years of data collection, teachers who received PM module training and PBC (Group 1) demonstrated higher levels of effective teaching practices (76.86), as measured by the TPOT, compared to those who received only PBC (Group 2) (69.79). This suggests that the PM module training may contribute positively to teacher practice, though the effectiveness appears to diminish over time for both groups.

The Mann-Whitney U-test was employed to test the significance between the mean score difference by group and by year. As shown in Table 3, there is a marginally significant difference between Group 1 and Group 2 in 2018–2019 (U = 14, $p$ = .93). In addition, there was a significant difference between Group 1 and Group 2 in 2019–2020 (U = 9.5, $p$ = .001). There were no significant differences between 2021–2022 and 2022–2023.

After examining the averages of both groups over the years, each of the 14 key practices analyzed the data further over the four years, as shown in Table 4.

**Table 4**

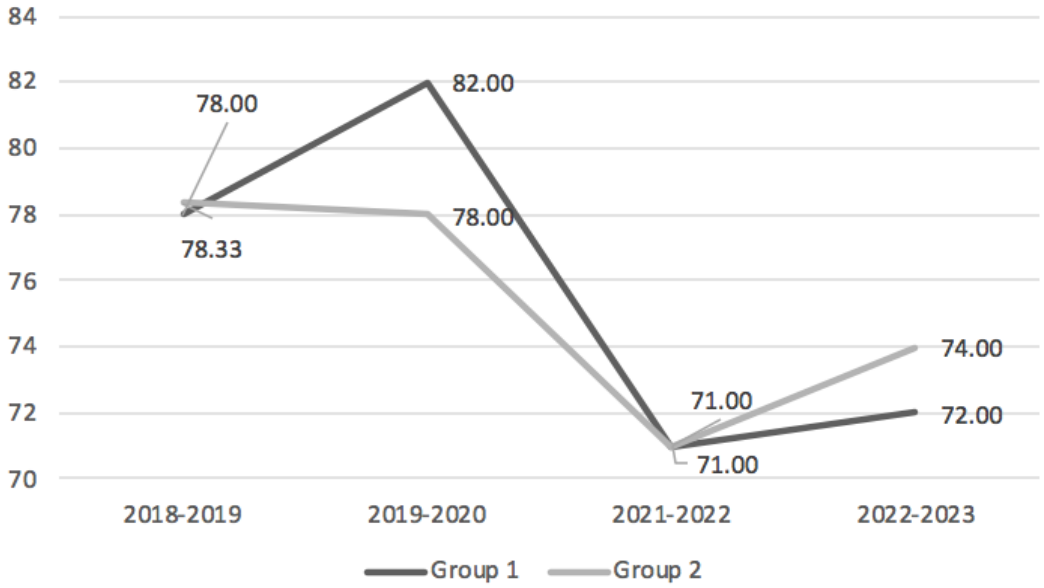
*Means by Group and Year for Each TPOT Key Practice*

| TPOT Key Practice Item | Group 1 | | | | Group 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | 18-19 | 19-20 | 21-22 | 22-23 | 18-19 | 19-20 | 21-22 | 22-23 |
| Schedules, Routines, Activities | 78.00 | 82.00 | 71.00 | 72.00 | 78.33 | 78.00 | 71.00 | 74.00 |
| Transitions | 85.00 | 90.00 | 71.25 | 61.25 | 70.83 | 66.25 | 68.75 | 73.75 |
| Supportive Conversations | 88.00 | 90.00 | 85.00 | 84.00 | 90.00 | 81.00 | 78.00 | 88.00 |
| Student Engagement | 84.45 | 84.45 | 78.89 | 83.34 | 77.78 | 76.67 | 77.78 | 73.34 |
| Providing Directions | 87.14 | 80.00 | 71.43 | 64.29 | 80.95 | 80.00 | 65.72 | 70.00 |
| Collaborative Teaming | 87.78 | 85.56 | 83.34 | 83.33 | 88.89 | 84.45 | 82.22 | 77.78 |
| Behavior Expectations | 55.71 | 72.86 | 62.86 | 55.71 | 69.05 | 57.14 | 52.86 | 48.57 |
| Social-Emotional Skills | 83.75 | 82.50 | 58.75 | 58.75 | 66.67 | 56.25 | 48.75 | 52.50 |
| Friendship Skills | 82.22 | 65.56 | 63.34 | 62.22 | 70.37 | 52.22 | 63.33 | 66.67 |
| Emotion Expression | 96.25 | 95.00 | 87.50 | 75.00 | 75.00 | 72.50 | 68.75 | 76.25 |
| Problem-Solving | 76.67 | 73.34 | 60.00 | 56.67 | 74.08 | 62.23 | 60.00 | 55.56 |
| Interventions | 84.00 | 84.00 | 74.00 | 72.00 | 56.67 | 56.00 | 70.00 | 61.50 |
| Connecting with Families | 95.00 | 90.00 | 76.25 | 72.50 | 72.92 | 70.00 | 73.75 | 55.00 |
| Family Use of PM | 80.00 | 78.57 | 71.43 | 57.14 | 61.91 | 60.00 | 71.43 | 52.86 |
| Average of Key Practices | 83.33 | 82.46 | 72.81 | 68.86 | 74.86 | 68.86 | 68.42 | 67.02 |

Figure 5 shows the average scores for the key practice of Schedules, Routines, and Activities, as the TPOT measured for Group 1 and Group 2 over the academic years 2018–2019 through 2022–2023. Data were not collected in 2020–2021. In 2018–2019, Group 1 scored 77.78, while Group 2 scored slightly higher at 78.33. In 2019–2020, Group 1 saw an increase to 82, whereas Group 2 decreased to 76.67. In 2021–2022, both groups showed a decline, with Group 1 dropping to 71 and Group 2 falling to 70. 2022–2023, Group 2 showed improvement, with scores increasing to 75, while Group 1 dropped to 70.

**Figure 5**

*Schedules, Routines, and Activities by Group by Year*



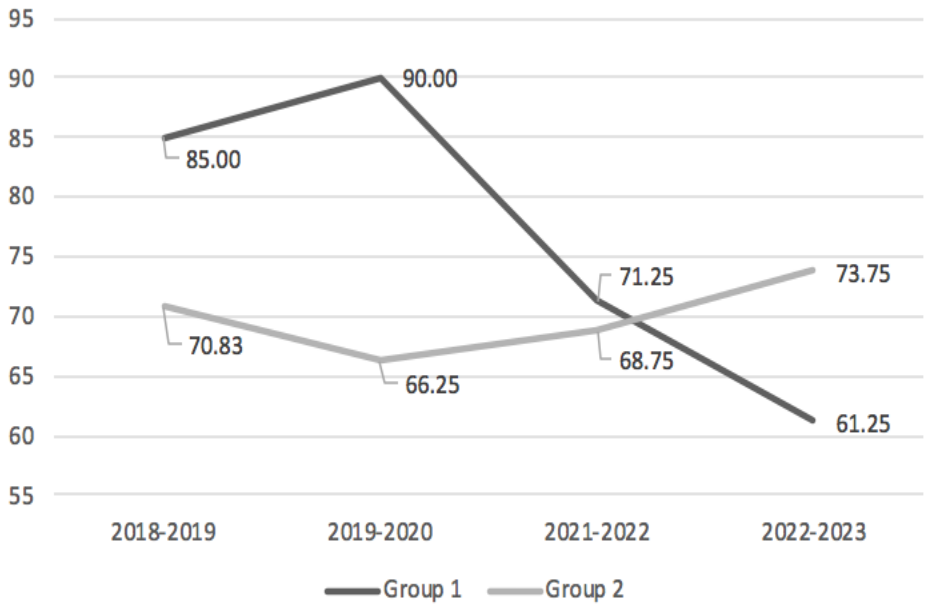

The Mann-Whitney U Test was employed to test the significance between the mean score difference by group and by year for the key practice of Schedules, Routines, and Activities. There was no significant difference between Group 1 and Group 2 in 2018–2019 ($U = 29.50$, $p = .956$). There was no significant difference between Group 1 and Group 2 in 2019–2020 ($U = 40.50$, $p = .439$). There was no significant difference between Group 1 and Group 2 in 2021–2022 ($U = 47.50$, $p = .843$). Lastly, there was no significant difference between Group 1 and

Group 2 in 2022–2023 (U = 49.50, $p$ = .969). However, in 2022–2023, Group 2 outperformed Group 1.

Figure 6 illustrates the average key practice of Transitions scores, measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019 to 2022–2023. Data were not collected for 2020–2021. Group 1 started with a score of 85.00 in 2018–2019, demonstrating performance above the fidelity marker of 80 in managing transitions, while Group 2 had a lower score of 70.83. In 2019–2020, Group 1's score increased to 90, whereas Group 2 experienced a decline to 62.25, widening the gap between the two groups. However, by 2021–2022, Group 1's performance dropped to 71.25, while Group 2 recovered to 73.75, bringing both groups to a similar level. In 2022–2023, the trends reversed. Group 2 experienced growth, reaching 73.75, while Group 1's performance declined, dropping to 61.25. The data indicates a convergence in 2021–2022, followed by a divergence in 2022–2023, where Group 2 improved while Group 1 struggled with a decline.

**Figure 6**

*Transitions by Group by Year*

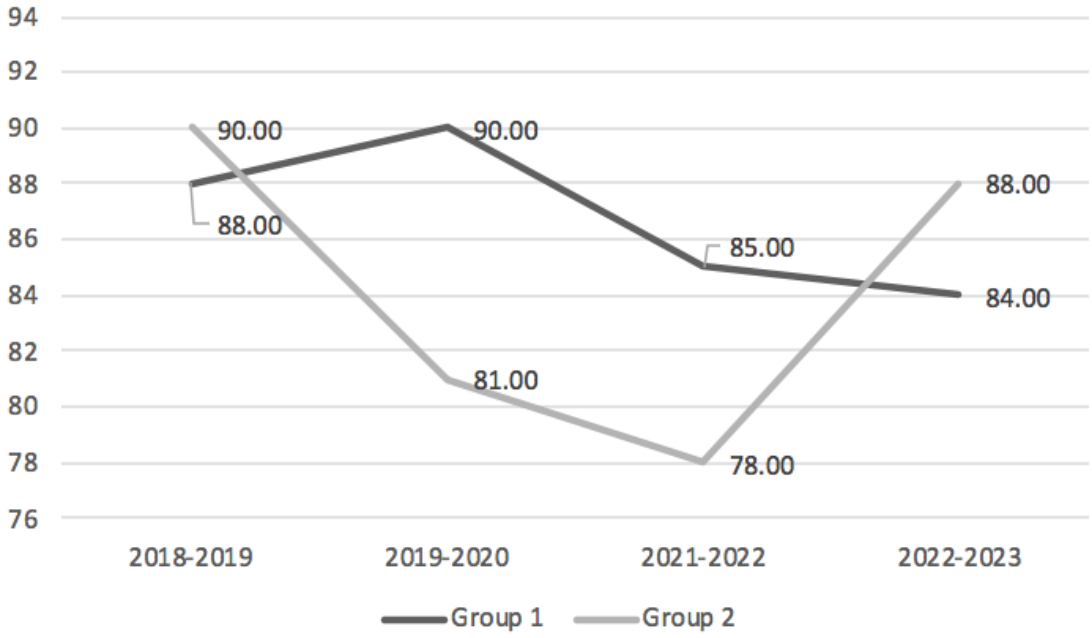


The Mann-Whitney U Test was also employed to test the significance between the mean score difference by group and by year for the key practice of Transitions. There was no significant difference between Group 1 and Group 2 in 2018–2019 (U = 22.00, $p$ = .368). There was a significant difference between Group 1 and Group 2 in 2019–2020 (U = 22.00, $p$ = .030). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 47.00, $p$ = .817). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 37.00, $p$ = .317).

Figure 7 shows the average scores for the key practice of Supportive Conversations, as measured by the TPOT, for Group 1 and Group 2 over the academic years 2018–2019 to 2022–2023.

**Figure 7**

*Teachers Engage in Supportive Conversations by Group by Year*




In 2018–2019, Group 1 began with a score of 88.00, while Group 2 had a slightly higher score of 90.00. In 2019–2020, Group 1 increased its score to 90.00, whereas Group 2 declined to 81. In

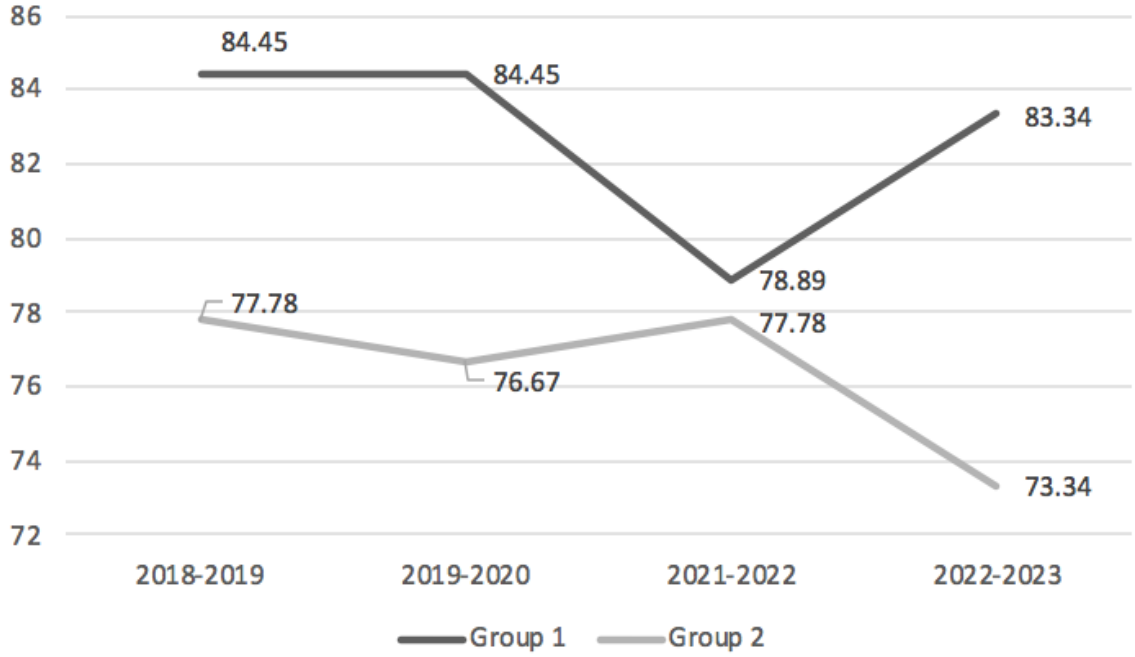
2021–2022, Group 1's score dropped slightly to 85.00, while Group 2's decreased further to 78.00. However, in 2022–2023, Group 2 showed improvement, rising to 88.00, while Group 1 decreased to 84.00. The data revealed a consistent performance by Group 1 through most years but with a slight dip starting from 2019–2020. Group 2, on the other hand, demonstrated a decline in earlier years but experienced a rebound in 2022–2023, ultimately almost matching its highest performance from the beginning of the observed period.

There was no significant difference between Group 1 and Group 2 in 2018–2019 (U = 26.00, $p$ = .642) in the key practice of Supportive Conversations. There was a significant difference between Group 1 and Group 2 in 2019–2020 (U = 24.00, $p$ = .037). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 37.50, $p$ = .335). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 38.00, $p$ = .345).

Figure 8 displays the average scores for the key practice of Promoting Children's Engagement, as the TPOT measures for Group 1 and Group 2 across the academic years 2018–2019 to 2022–2023. Data were not collected for the 2020–2021 school year. In 2018–2019, Group 1 had a higher score of 84.45, while Group 2 started lower at 77.78. In 2019–2020, Group 1 stayed consistent at a score of 84.45, whereas Group 2 experienced a decline to 76.67. By 2021–2022, Group 1 dropped to 78.89, and Group 2 increased to 77.78. In 2022–2023, Group 1 rebounded, with its score rising to 83.34. However, Group 2 declined, reaching its lowest score of 73.34. The trends indicate that Group 1 maintained a relatively high level of student engagement throughout the observed years, with some fluctuations, while Group 2 experienced a slight decrease in performance over time. This suggests that Group 1 consistently implemented more effective student engagement practices, especially in 2022–2023.

**Figure 8**

*Promoting Children's Engagement Student Engagement by Group by Year*



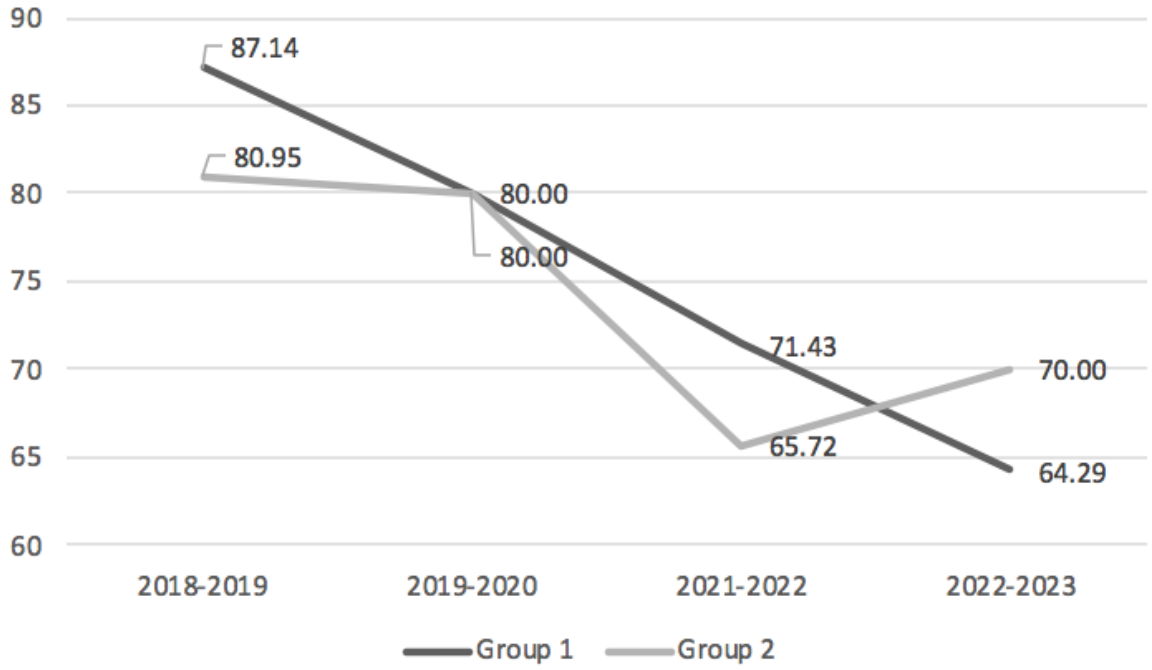

The Mann-Whitney U Test was used to test the significance between the mean score difference by group and year for the key practice of Promoting Children's Engagement. There was no significant difference between Group 1 and Group 2 in 2018–2019 (U = 28.50, $p$ = .861). There was no significant difference between Group 1 and Group 2 in 2019–2020 (U = 37.00, $p$ =.295). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 43.50, $p$ = .608). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 43.50, $p$ = .614).

Figure 9 presents the average scores for the key practice of Providing Directions, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019 through 2022–2023. In 2018–2019, Group 1 achieved a high score of 87.14, while Group 2 followed with a lower score of 80.95. By 2019–2020, both groups experienced declines, with Group 1 and Group 2 dropping to 80. This downward trend continued into 2021–2022, where Group 1 further

decreased to 71.43, and Group 2 dropped to 65.72. In 2022–2023, Group 1 continued to decline to 64.29, while Group 2 recovered, increasing to 70.00. Group 1 consistently performed better or the same as Group 2 over the observed period up until the most recent year.

**Figure 9**

*Providing Directions by Group by Year*



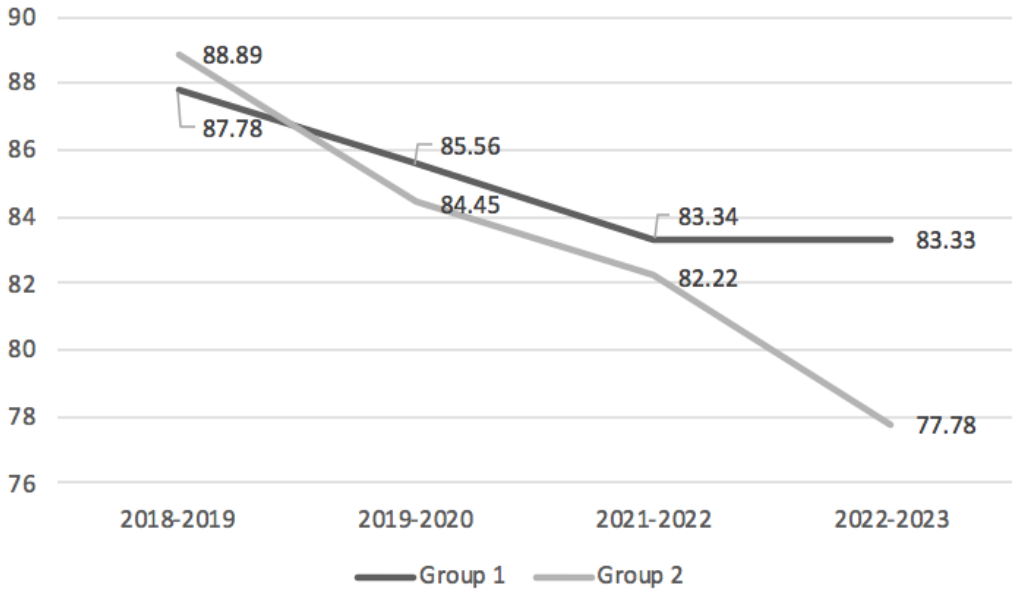

The Mann-Whitney U Test was employed to test the significance of the mean score difference by group and year for the key practice of Providing Directions. There was no significant difference between Group 1 and Group 2 in 2018–2019 (U = 26.00, $p$ = .644). There was no significant difference between Group 1 and Group 2 in 2019–2020 (U = 48.50, $p$ = .906). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 41.50, $p$ = .490). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 40.50, $p$ = .459).

Figure 10 presents the average key practice of Collaborative Teaming scores, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–

2020, 2021–2022, and 2022–2023. In 2018–2019, both groups started with scores over the fidelity marker of 80. Group 1 scored 87.78, while Group 2 slightly outperformed with 88.89. In 2019–2020, both groups saw a slight decline, with Group 1 decreasing to 85.56 and Group 2 dropping to 84.45. By 2021–2022, after the gap year, both groups experienced further decreases, with Group 1 scoring 83.34 and Group 2 at 82.22. However, in 2022–2023, Group 1 remained relatively stable at 83.33, while Group 2 declined to 77.78. These results indicate that while both groups saw some decline in collaborative teaming practices, Group 1 remained more consistent over time. In contrast, Group 2 experienced a drop in the most recent two years.

**Figure 10**

*Collaborative Teaming by Group by Year*



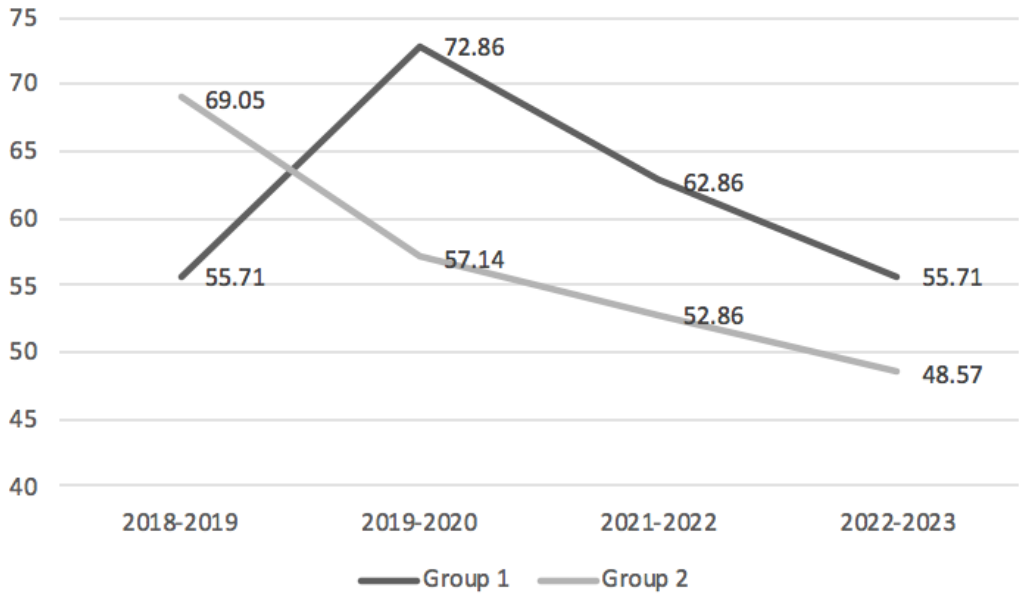

In order to test the significance of the mean score difference by group and by year for the key practice of Collaborative Teaming, the Mann-Whitney U Test was employed. There was no significant difference between Group 1 and Group 2 in 2018–2019 (U = 27.50, $p$ = .740). There was no significant difference between Group 1 and Group 2 in 2019–2020 (U = 48.00, $p$ = .868). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 49.00, $p$ =

.935). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 34.00, $p$ = .206).

Figure 11 presents the average scores for the key practice of Teaching Behavior Expectations, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–2020, 2021–2022, and 2022–2023. Data were not collected for 2020–2021. In 2018–2019, Group 1 began with a lower score of 55.71, while Group 2 performed better with a score of 69.05. In 2019–2020, Group 1 showed improvement and increased to 72.86, while Group 2 decreased to 57.14. However, by 2021–2022, both groups saw a decline in their scores. Group 1 dropped to 62.86, and Group 2 experienced a sharper decrease to 52.86. 2022–2023, Group 1 declined to 55.71, while Group 2 declined to 48.57.

**Figure 11**

*Teaching Behavior Expectations by Group by Year*



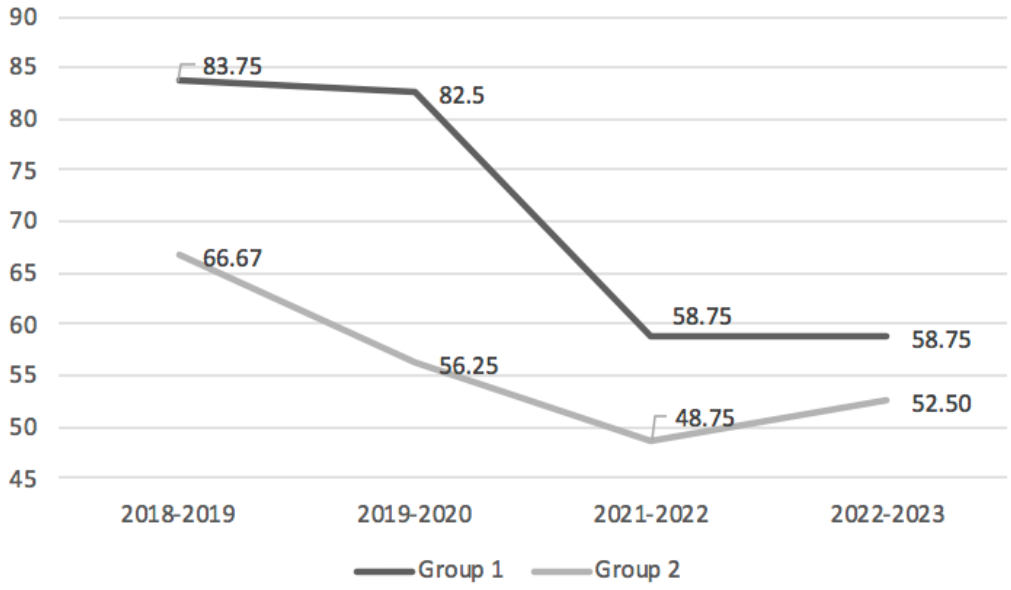

The Mann-Whitney U Test was employed to test the significance between the mean score difference by group and by year for the key practice of Teaching Behavior Expectations. There was no significant difference between Group 1 and Group 2 in 2018–2019 (U = 24.50, $p$ = .546).

There was no significant difference between Group 1 and Group 2 in 2019–2020 (U = 37.50, $p$ = .333). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 38.50, $p$ = .375). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 47.50, $p$ = .848).

Figure 12 shows the average scores for the key practice of Teaching Social Emotional Skills and Emotional Competencies, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–2020, 2021–2022, and 2022–2023. In 2018–2019, Group 1 had a good start with a score of 86.11, while Group 2 had a lower score of 66.67. In 2019–2020, Group 1 dropped to 82.5, and Group 2 saw a slight improvement, rising to 67.5.

**Figure 12**

*Teaching Social-Emotional Skills by Group by Year*




In 2021–2022, both groups experienced a decline after the gap year. Group 1's score dropped to 58.75, while Group 2 fell to 56.25. 2022–2023, Group 1 remained stable at 58.75, while Group 2 dropped to 54.17. This data highlights that while Group 1 maintained a higher level of performance in teaching social-emotional skills over the years, both groups faced considerable

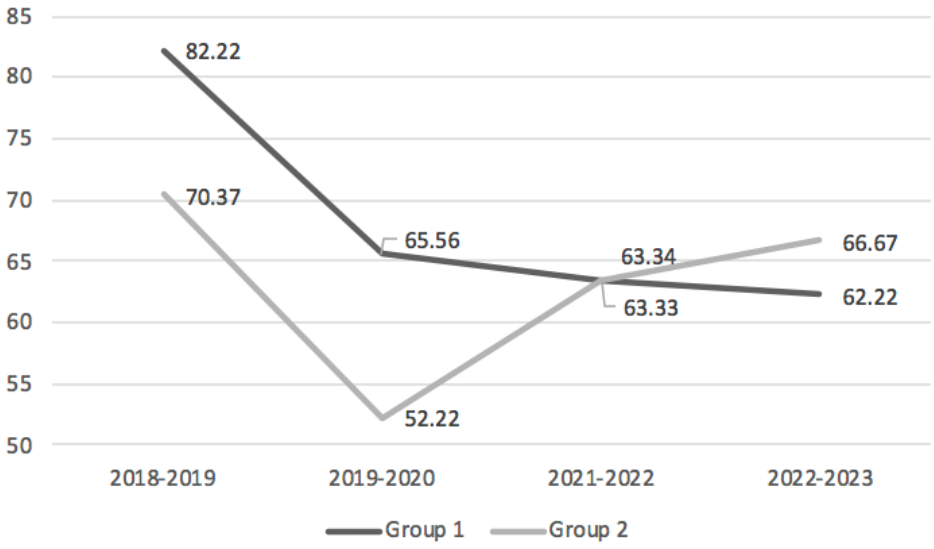
challenges in sustaining these practices, particularly after the 2020–2021 gap year.

The Mann-Whitney U Test was used to test the significance between the mean score difference by group and year for the key practice of Teaching Social Emotional Skills and Emotional Competencies. There was no significant difference between Group 1 and Group 2 in 2018–2019 (U = 19.00, $p$ = .219). There was a significant difference between Group 1 and Group 2 in 2019–2020 (U = 19.50, $p$ = .020). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 34.50, $p$ = .231). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 47.00, $p$ = .817).

Figure 13 shows the average scores for the key practice of Teaching Friendship Skills, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–2020, 2021–2022, and 2022–2023.

**Figure 13**

*Teaching Friendship Skills by Group by Year*




In 2018–2019, Group 1 started with a score of 82.72, while Group 2 began lower, at 70.37. By 2019–2020, both groups experienced a decline, with Group 1 dropping to 65.56 and Group 2

falling to 64.44, indicating a narrowing gap between the two groups. In 2021–2022, the scores of both groups further decreased, with Group 1 dropping to 63.33 and Group 2 to 57.41. In 2022–2023, Group 1 declined slightly to 62.22, while Group 2 rebounded more substantially to 68.52, surpassing Group 1 for the first time in the observed period. This suggests that while both groups faced a general decline in performance, Group 2 demonstrated greater resilience and improvement in recent years. In contrast, Group 1 struggled to regain its earlier high performance in teaching friendship skills.

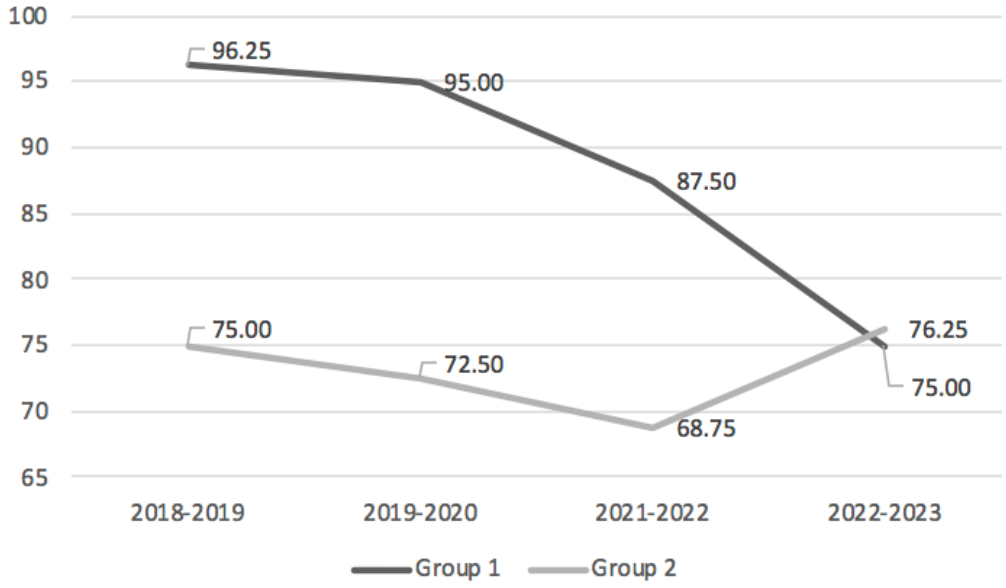
The Mann-Whitney U Test was employed to test the significance between the mean score difference by group and by year for the key practice of Teaching Friendship Skills. There was no significant difference between Group 1 and Group 2 in 2018–2019 ($U = 17.50$, $p = .157$). There was no significant difference between Group 1 and Group 2 in 2019–2020 ($U = 33.00$, $p = .188$). There was no significant difference between Group 1 and Group 2 in 2021–2022 ($U = 47.00$, $p = .819$). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 ($U = 38.50$, $p = .377$).

Figure 14 illustrates the average scores for the key practice of Teaching Children to Express Emotions, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–2020, 2021–2022, and 2022–2023. Data were not collected for 2020–2021. In 2018–2019, Group 1 began with a high score of 97.22, indicating high performance, while Group 2 started lower at 75. In 2019–2020, Group 1's score declined slightly to 95, while Group 2's improved to 77.5, narrowing the gap between the two groups. However, in 2021–2022, both groups experienced substantial declines, with Group 1 dropping to 87.5 and Group 2 falling sharply to 62.5, indicating challenges in sustaining high-performance levels. In 2022–2023, Group 1 continued its decline, reaching 75, while Group 2 showed a recovery, increasing to

72.92, closing the gap even further. These trends suggest that although Group 1 started with consistently higher scores, its performance in teaching children to express emotions has steadily declined over time. In contrast, Group 2, after a drop, made notable improvements in the most recent year, nearly matching Group 1.

**Figure 14**

*Teaching Children to Express Emotions by Group by Year*



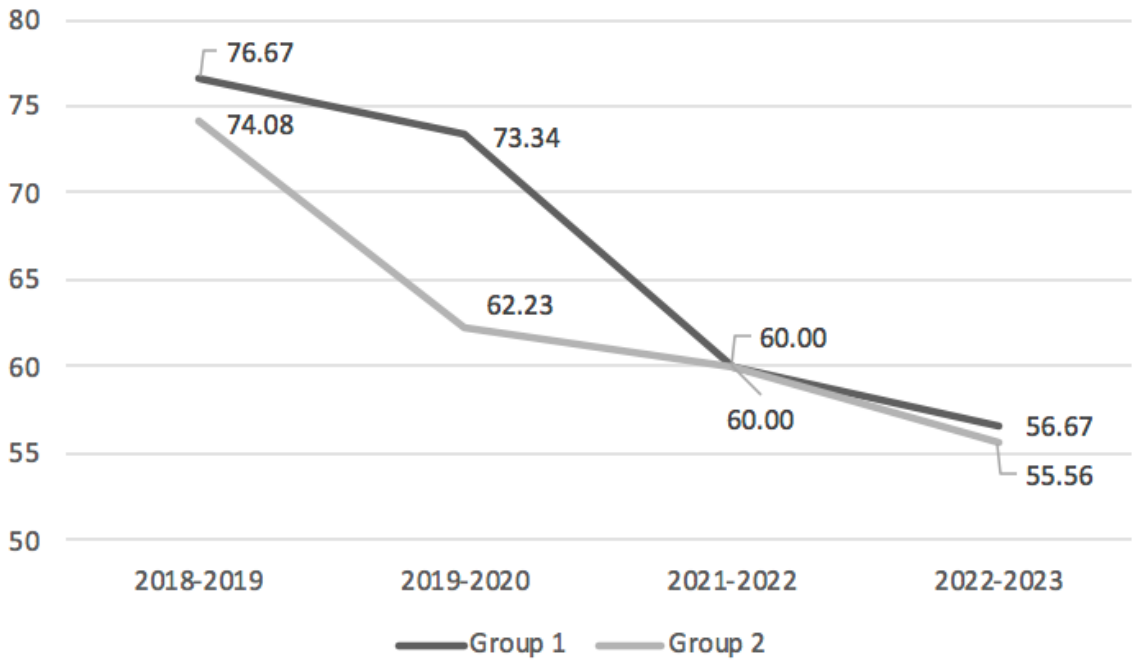

The Mann-Whitney U Test was employed to test the significance between the mean score difference by group and by year for the key practice of Teaching Children to Express Emotion. There was a marginally significant difference between Group 1 and Group 2 in 2018–2019 (U = 14.50, $p$ = .062). There was a significant difference between Group 1 and Group 2 in 2019–2020 (U = 15.00, $p$ = .005). There was a marginally significant difference between Group 1 and Group 2 in 2021–2022 (U = 24.00, $p$ = .042). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 48.50, $p$ = .907).

Figure 15 shows the average scores for the key practice of Teaching Problem Solving, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–

2020, 2021–2022, and 2022–2023. Data were not collected for 2020–2021. In 2018–2019, Group 1 started with a higher score of 77.78, while Group 2 scored 74.07. In 2019–2020, both groups saw a decline, with Group 1 dropping to 73.33 and Group 2 falling more sharply to 64.44, widening the gap between the two. In 2021–2022, the downward trend continued, with Group 1 decreasing to 60 and Group 2 falling further to 53.7, indicating challenges for both groups in maintaining effective practices for teaching children problem-solving skills. By 2022–2023, Group 1 fell to 56.67, and Group 2 improved to 55.56, narrowing the performance gap. The data suggests that both groups struggled with teaching problem-solving consistently over the years, with noticeable declines after 2019–2020.

**Figure 15**

*Teaching Problem Solving by Group by Year*



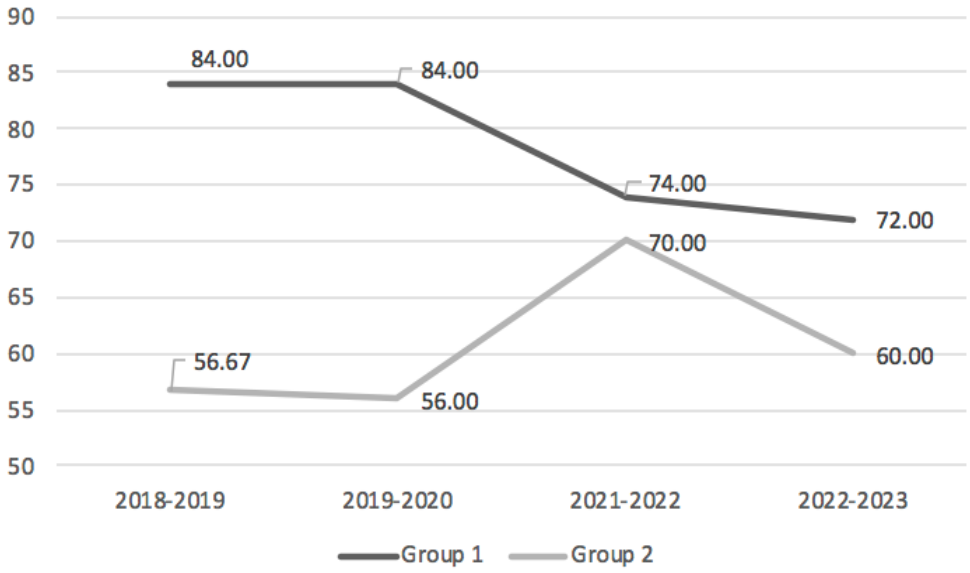

In order to test the significance of the mean score difference by group and by year for the key practice of Teaching Problem Solving, the Mann-Whitney U Test was employed. There was no significant difference between Group 1 and Group 2 in 2018–2019 ($U = 28.00$, $p = .824$).

There was no significant difference between Group 1 and Group 2 in 2019–2020 (U = 32.50, $p$ = .166). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 49.00, $p$ = .939). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 49.50, $p$ = .969).

Figure 16 presents the average scores for the key practice of Interventions for Children with Persistent Challenging Behavior, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–2020, 2021–2022, and 2022–2023.

**Figure 16**

*Interventions for Children with Persistent Challenging Behavior by Group by Year*




Data were not collected for 2020–2021. In 2018–2019, Group 1 began with a high score of 82.22, while Group 2 scored lower at 56.67. In 2019–2020, Group 1 saw a slight improvement, increasing to 84, while Group 2's score dropped marginally to 56. By 2021–2022, Group 1's score decreased to 74, and Group 2's increased to 66.67, indicating a narrowing gap between the two groups. In 2022–2023, Group 1's performance declined slightly to 72, while Group 2 reverted to its original score of 56.67, again widening the gap. The data suggests that while

Group 1 consistently outperformed Group 2, both groups struggled to maintain intervention practices over time. Group 2 showed temporary improvement in 2021–2022 but could not sustain it in the following year, while Group 1 has seen a gradual decline in effectiveness since the 2019–2020 school year.

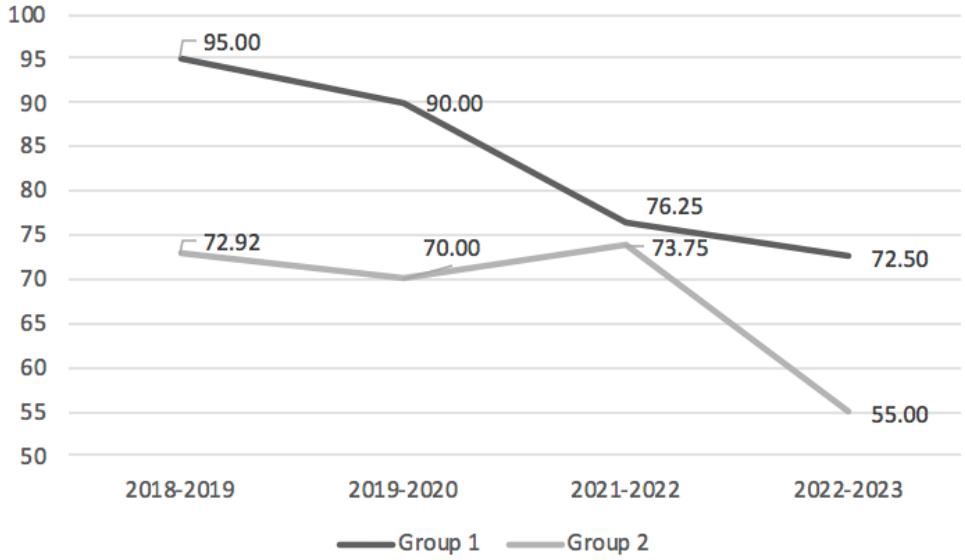
The Mann-Whitney U Test was employed to test the significance between the mean score difference by group and by year for the key practice of Interventions for Children with Persistent Challenging Behavior. There was a significant difference between Group 1 and Group 2 in 2018–2019 ($U = 7.50$, $p = .11$). There was a significant difference between Group 1 and Group 2 in 2019–2020 ($U = 16.00$, $p = .008$). There was no significant difference between Group 1 and Group 2 in 2021–2022 ($U = 43.00$, $p = .585$). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 ($U = 38.00$, $p = .352$).

Figure 17 shows the average scores for the key practice of Connecting with Families, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–2020, 2021–2022, and 2022–2023. Data were not collected for 2020–2021. In 2018–2019, Group 1 had a very high score of 94.44, while Group 2 scored lower at 72.92. By 2019–2020, both groups experienced a decline. Group 1 dropped to 90, while Group 2 decreased slightly to 72.5. In 2021–2022, both groups saw further declines, with Group 1 dropping to 76.25 and Group 2 falling to 70.83, although the gap between the two groups remained. By 2022–2023, Group 1's performance continued to decline, with a score of 72.5, while Group 2 saw a much sharper decline, falling to 56.25. This data suggests that while Group 1 consistently outperformed Group 2 in connecting with families, both groups faced challenges maintaining practices over time, particularly Group 2, which showed a sharp decline in the most recent year. The sharp drop in Group 2's scores between 2021–2022 and 2022–2023 may indicate difficulties sustaining family

engagement efforts over time.

**Figure 17**

*Connecting with Families by Group by Year*



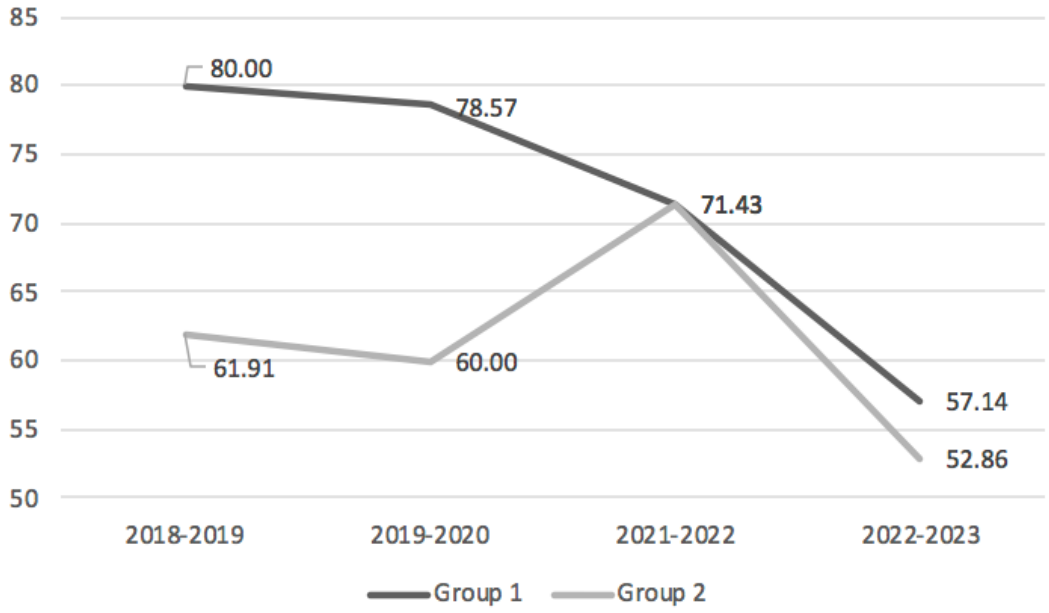

The Mann-Whitney U Test was employed to test the significance between the mean score difference by group and by year for the key practice of Connecting with Families. There was a significant difference between Group 1 and Group 2 in 2018–2019 (U = 10.50, $p$ = .023). There was a significant difference between Group 1 and Group 2 in 2019–2020 (U = 16.50, $p$ = .008). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 47.50, $p$ = .839). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 31.00, $p$ = .145).

Figure 18 presents the average scores for the key practice of Supporting Family Use of PM Practices, as measured by the TPOT, for Group 1 and Group 2 across the academic years 2018–2019, 2019–2020, 2021–2022, and 2022–2023. Data were not collected for 2020–2021. In 2018–2019, Group 1 started with a score of 79.37, which was just shy of the fidelity marker 80, while Group 2 scored lower at 61.9. By 2019–2020, Group 1 experienced a slight decline to

78.57, while Group 2 saw an improvement, rising to 71.43, closing the gap between the two groups. In 2021–2022, both groups experienced declines, with Group 1 dropping to 71.43 and Group 2 falling to 66.67, although the gap remained relatively consistent. However, by 2022–2023, both groups saw substantial drops in their scores, with Group 1 declining to 57.14 and Group 2 to 52.38.

**Figure 18**

*Supporting Family Use of PM by Group by Year*




The Mann-Whitney U Test was employed to test the significance between the mean score difference by group and by year for the key practice of Supporting Family Use of PM Practices. There was a marginally significant difference between Group 1 and Group 2 in 2018–2019 (U = 15.00, $p$ = .092). There was a significant difference between Group 1 and Group 2 in 2019–2020 (U = 21.50, $p$ = .027). There was no significant difference between Group 1 and Group 2 in 2021–2022 (U = 48.50, $p$ = .908). Lastly, there was no significant difference between Group 1 and Group 2 in 2022–2023 (U = 45.00, $p$ = .908).

Group 1 consistently scored higher in practices related to Emotion Expression, Connecting with Families, and Collaborative Teaming. Group 2 had relatively stable Supportive Conversations and Transitions scores but lagged in other key practices.

**Research Question 2**

*What was the implementation experience of the teachers who received PM module training and PBC compared to teachers who received PBC only?*

Five emerging themes were identified through inductive thematic analysis. The responses were reviewed, relevant segments were coded, and the themes were grouped into broader themes. Teachers who received PM module training and PBC are called Group 1, and teachers who only received PBC are referred to as Group 2.

***Theme 1: Impact on Teaching Practices***

The teachers in Group 1 emphasized the resources and strategies provided by the PM training, which helped them manage challenging behaviors and teach social-emotional skills effectively. Group 1 participant responses included, "Pyramid Model has given me the resources to teach social-emotional skills explicitly" and "The methods and strategies I've learned and put into practice in my classroom have been of great support when addressing challenging behavior." The Group 1 teachers discussed the resources and strategies they learned through the module training. They asserted that they could implement the specific teaching strategies into practice in their classrooms, which in turn impacted their overall teaching while also being able to address challenging behavior effectively.

The teachers in Group 1 discussed addressing all tiers of the PM in their practice. They used the strategies they learned in training to develop nurturing and responsive relationships with their students, they designed high-quality supportive environments with a focus on explicitly

teaching social-emotional skills, and they were able to implement targeted social-emotional supports and intensive interventions for the children that required additional support.

The teachers in Group 2 focused on the relationship-building aspect and proactive measures to prevent challenging behaviors. A response stated, "The Pyramid Model has helped me understand and focus on building relationships as the strong foundation for my classroom environment." The Group 2 teachers spoke to the first tier of the PM. Their answers focused on building relationships with children and implementing universal prevention practices to support all children.

The difference between the two groups was that the Group 1 teachers who received the workshop training and PBC discussed all tiers of the PM and how the practices at each level impacted their teaching. Conversely, the teachers in Group 2 who received PBC only spoke to the first tier of the PM. Group 1 teachers discussed developing nurturing and responsive relationships, high-quality supportive environments, targeted social-emotional supports, and intensive interventions. The teachers in Group 2 spoke about developing relationships and how that impacted the classroom environment. Additional quotes can be found in Appendix B.

### *Theme 2: Support from Coaching*

As shown in Appendix C, the teachers in Group 1 valued the constructive feedback and the collaborative approach of coaching, which helped them reflect on and improve their practices. Responses include, "Coaching has called my attention to strategies that can be used for the child to best support their behavior" and "The feedback given by the coach is not judgmental and gives me the opportunity to identify areas of growth."

The teachers in Group 2 appreciated the teamwork aspect and specific problem-solving support provided by the coaching. A response stated, "Practice-based coaching has helped me

feel like part of a team that is there to support me in my teaching practices."

### *Theme 3: Challenges in Implementation*

As shown in Appendix D, the teachers in Group 1 highlighted the complexity of the TPOT assessment and the need for more frequent planning with support staff. Examples of responses included, "The TPOT assessment tool feels overwhelming and too much to focus on at once" and "One of the challenges is being able to meet frequently to plan with other support staff."

The teachers in Group 2 pointed out issues with parental cooperation and the need for more training for all staff, including paraprofessionals and floating teacher assistants. Examples of responses included, "The challenge for me is when parents are not willing to cooperate and follow up with strategies" and "Need more training, especially for paraprofessionals and floaters."

### *Theme 4: Perceived Benefits*

As shown in Appendix E, the teachers in Group 1 reported positive impacts on classroom management and student behavior, noting significant improvements in social-emotional skills and reductions in challenging behaviors. Examples of responses noted, "Significant improvements in the implementation of the Pyramid in my classroom and reductions in problem behavior" and "I have created a classroom environment where my students feel safe and happy while also receiving individualized support."

The teachers in Group 2 found the Pyramid Model helpful in building stronger relationships and creating a positive classroom environment. A response stated, "It has helped me build stronger relationships with co-workers, children, and families."

### *Theme 5: Support Needed*

As shown in Appendix F, the teachers in Group 1 expressed a need for more workshops for families, additional training for paraprofessionals, and structured timelines for implementing skills. Examples of responses included "More workshops for families to help them at home use the Pyramid Model resources" and "Providing more training for paraprofessionals using the Pyramid Model."

The teachers in Group 2 requested Pyramid Model training and role-playing scenarios to better understand. Examples of responses included, "To have the Pyramid module training, specifically the one on addressing challenging behaviors," and "Role-play may be useful with different scenarios."

The implementation experiences of teachers who received PM module training and PBC (Group 1) versus those who received only PBC (Group 2) highlight several key differences. The teachers in Group 1 benefited from specific resources and strategies provided by the PM training, which may have improved their handling of challenging behaviors and social-emotional teaching practices. They also appreciated the reflective and collaborative coaching approach but faced challenges with the complexity of the TPOT assessment and needed more support for planning and family involvement. The teachers in Group 2 focused on relationship-building and proactive behavior management. They valued the supportive team environment created by the coaching but needed more comprehensive training for all staff and faced challenges with parental cooperation and staff training consistency. Both groups expressed the need for continuous support and additional training to effectively implement the PM and address challenging behaviors in the classroom.

## Summary

This chapter presented findings from a longitudinal program implementation evaluation study conducted by using quantitative and qualitative data to examine the impact of PM training and PBC on preschool teacher practices. Using TPOT scores and teacher survey responses, the study compared Group 1 (PM training + PBC) and Group 2 (PBC only). Quantitative data were analyzed using descriptive and inferential statistics, while qualitative data were explored through thematic analysis to assess differences in implementation and teacher experience.

Quantitative results showed that Group 1 consistently outperformed Group 2 in most TPOT key practice areas, particularly during the early years of implementation (2018–2020). Statistically significant differences were observed in 2019–2020 across several areas, including Transitions, Supportive Conversations, Social-Emotional Skills, and Family Engagement. In 2018–2019, Group 1 scored significantly or marginally higher in Emotion Expression and Interventions for Challenging Behavior. However, by 2021–2023, scores declined in both groups, and differences were no longer statistically significant, though Group 1 maintained slightly higher averages.

The thematic analysis of teacher surveys revealed five key themes:

1. Impact on Teaching Practices – Group 1 used specific PM strategies (e.g., scripted stories, Turtle Technique, visual supports), while Group 2 emphasized relationship-building and general proactive management.
2. Support from Coaching – Group 1 valued reflective, non-judgmental feedback that promoted growth, whereas Group 2 appreciated coaching for classroom support but reported less emphasis on deeper reflection.
3. Challenges in Implementation – Group 1 cited the TPOT as overwhelming and desired more collaboration time, while Group 2 identified limited parent involvement and

insufficient paraprofessional training as barriers.

4. Perceived Benefits – Group 1 noted improvements in student behavior and SEL skills; Group 2 highlighted stronger relationships and positive classroom environments.
5. Support Needed – Group 1 requested more family workshops and paraprofessional training; Group 2 asked for additional training in behavior strategies and practical role-play activities.

Overall, the study suggests that PM training combined with PBC had a more substantial and immediate impact than PBC alone, particularly in structured intervention use. However, the decline in TPOT scores over time for both groups and the narrowing gap between them highlight concerns about sustainability. Findings suggest the need for ongoing coaching, continuous professional development, and stronger implementation fidelity to support and maintain effective practice over time.

# CHAPTER V

# DISCUSSION

This study aimed to examine the impact of professional development (PD) and practice-based coaching (PBC) on preschool teachers' implementation of Pyramid Model (PM) practices over five years. Using a program implementation study approach using quantitative and qualitative data, this study analyzed archival Teaching Pyramid Observation Tool (TPOT) scores to assess implementation fidelity and gathered qualitative insights from an open-ended teacher survey. The findings revealed a statistically significant difference between teachers who received both PM training and PBC compared to those who received only PBC, particularly in 2019–2020, where Group 1 (PD + PBC) demonstrated higher levels of effective teaching practices than Group 2 (PBC only). Additionally, significant differences were observed in specific key teaching practices, including Transitions, Supportive Conversations with Children, Promoting Children's Engagement, Teaching Social Emotional Skills and Emotional Competencies, Teaching Children to Express Emotions, Interventions for Children with Persistent Challenging Behavior, Connecting with Families, and Supporting Family Use of PM Practices. In short, statistical significance was found between the two groups in eight of the 14 key practices, suggesting that PM training could likely play a critical role in effective implementation.

The results of the quantitative data are intriguing since they peak during the 2019–2020 school year, two years post-module training, and then drop in the 2021–2022 school year, four years post-module training. One may speculate that the decline in scores could be related to the amount of time that passed from the module training, but it is important to note that data were not collected during the 2020–2021 school year due to the school closings that occurred because of the COVID-19 pandemic.

The analysis of teacher practice over time revealed notable differences between teachers who received PM training and PBC and those who received only PBC. Teachers who received comprehensive PM training alongside PBC demonstrated higher fidelity in implementing PM practices, as evidenced by their TPOT scores, especially in the early years following training. These teachers exhibited higher proficiency in teaching particular key practices.

However, over time, scores declined across all participants, suggesting that sustaining high levels of PM implementation can be challenging without continued PD and systemic support. While benefiting from coaching, these teachers demonstrated lower TPOT scores in key areas such as Teaching Social-Emotional Skills and Interventions for Children with Persistent Challenging Behavior. This suggests that while coaching reinforces skills, initial comprehensive training is critical in long-term implementation fidelity.

Qualitative findings from the teacher survey responses further corroborate these trends. Many teachers expressed a need for ongoing support, additional professional development, and strategies to manage implicit bias and challenging behaviors effectively. The findings suggest that while PM training paired with PBC is highly effective in enhancing teacher practice, sustaining these gains over multiple years requires continuous reinforcement through refresher training, peer collaboration, and administrative support. These results underscore the importance of structured MTSS to ensure the sustainability of PM implementation. They are consistent with the findings of Fox et al. (2011), which examined training, coaching, and implementation of PM MTSS in preschool settings. Like their study, the data shows a functional relationship between workshop training and coaching in implementing PM teaching practices.

Teachers who received only PBC exhibited differences in their implementation of PM practices compared to those who received both PM training and PBC. While initial TPOT scores

among PBC-only teachers showed moderate proficiency levels, their ability to sustain and generalize PM practices over time was less consistent. Specifically, teachers in this group demonstrated lower scores in teaching behavior expectations and addressing challenging behaviors.

Over multiple school years, a gradual decline in TPOT scores was observed in this group, suggesting that coaching alone, without foundational training, may not be sufficient to maintain long-term implementation fidelity. While PBC was beneficial in reinforcing specific instructional strategies and promoting incremental improvements in practice, teachers without formal PM training struggled more with adapting PM principles to diverse classroom challenges. The lack of an initial structured learning experience meant that these teachers had to rely primarily on in-the-moment feedback and self-guided implementation, leading to inconsistencies in practice and a slower rate of skill acquisition than their trained counterparts.

Qualitative teacher survey responses further highlighted these challenges, with many PBC-only teachers expressing a need for additional structured training and professional development opportunities. Some reported difficulties in fully understanding and applying the multi-tiered intervention strategies embedded in the PM framework, particularly in interventions for children with persistent challenging behavior.

Overall, the findings suggest that while PBC plays a crucial role in reinforcing best practices and providing individualized support, it is likely more effective when combined with prior formal PM training. These findings are consistent with Rojas et al. (2020), suggesting that combining training and coaching and using developmentally appropriate curricula are the key components that produce the most significant improvements in teachers' practices, classroom quality, and range of child outcomes. A PD program should target specific teaching practices to

improve teaching practices and support gains in children's learning. Furthermore, PD should include didactic instruction (e.g., workshops) with weekly/biweekly support from coaches. Without ongoing training, teachers gradually decline PM implementation fidelity over time, suggesting the need for structured PD to complement coaching efforts. These results reinforce the importance of integrating training and coaching as a comprehensive, long-term strategy for sustaining effective teaching practices in early childhood education.

The findings of this study are consistent with the previous research on PM implementation. As consistent with Hemmeter et al. (2015), teachers' TPOT scores increased after they received coaching on specific PM practices. As consistent with Hemmeter et al. (2016), results indicated that workshop training with individualized coaching effectively increased teachers' implementation of key practices following PD. Consistent with Hemmeter et al. (2021), the results suggest that teachers can implement PM practices better if they receive training and PBC. However, more time and support may be needed to sustain high fidelity of implementation and to have greater effects on children. Additionally, results aligned with Snyder et al. (2022), suggesting that PD may be associated with a measurable change in teacher practice if it is cohesive and sustained over time. Findings are also consistent with Kranski and Steed (2022), suggesting that pairing training with PBC is associated with improvements in preschool teaching practices.

In short, the findings from this study align with the existing literature on the effectiveness of PD and PBC in early childhood education. Research has consistently shown that targeted training combined with PBC can improve teacher practices and student outcomes (Hemmeter et al., 2016). This study supports the previous research, and the data demonstrates that teachers who received both PM training and PBC exhibited more effective teaching practices and stated that

they were better equipped to manage challenging behaviors than those who received only PBC.

The findings of this study align with Bronfenbrenner's Ecological Systems Theory, which emphasizes the interconnectedness of multiple environmental systems in shaping human development (Bronfenbrenner, 1979). In the context of this study, the implementation of PM training and PBC for preschool teachers represents a systemic intervention that not only influences teacher practice but also affects students, families, and the broader school community. There is an interconnected impact across the different ecological systems described in Bronfenbrenner's theory. When preschool teachers receive PM training and PBC, improvements in teacher practice directly enhance student social-emotional learning (SEL) and behavior within classrooms. These positive changes at the microsystem (classroom) level are also likely to influence family interactions at home, as children who gain stronger SEL skills are likely to demonstrate improved behavior and emotional regulation outside the school environment.

Furthermore, improvements in classroom environments and family dynamics collectively are likely to contribute to a healthier school climate and stronger community relationships at the mesosystem and exosystem levels. Thus, a systemic intervention targeting teacher practice is likely to trigger beneficial outcomes across multiple interconnected layers, likely reinforcing students' overall social-emotional and academic development. Examining teacher training and coaching within Bronfenbrenner's framework shows that each ecosystem layer interacts and reinforces the others, which has the likelihood of shaping students' social-emotional development and behavioral and academic outcomes.

At the microsystem level, preschool teachers who received PM training and PBC demonstrated higher fidelity in implementing social-emotional teaching strategies. This may lead to trends in improved student SEL skills and decreased instances of challenging behavior. The

direct teacher-student interaction in the classroom is one of the most immediate and impactful influences on child development. Training teachers is likely to create a more structured, responsive, and emotionally supportive learning environment by explicitly teaching SEL skills, modeling positive interactions, and implementing consistent behavioral supports. As students develop greater emotional regulation and problem-solving skills, it increases the likelihood that they will engage more positively with peers and adults, thus potentially improving classroom climate. Additionally, the less time preschool teachers are consumed with addressing challenging behavior, they are more likely to have more time to teach important skills across all areas of development.

Beyond the classroom, the mesosystem reflects the interaction between different components of a child's life, including teacher-family relationships. Teachers who feel more confident and supported in their roles are more likely better equipped to collaborate with families, provide guidance on reinforcing SEL skills at home, and support parents in managing their children's behavior. As children develop stronger SEL competencies, parents are likely to experience reduced stress and improved family interactions, making parenting less reactive and more proactive. This bidirectional influence highlights how teacher training indirectly affects families, extending the impact of school-based SEL instruction into home environments.

The exosystem further contextualizes these interactions by considering how school leadership, district policies, and community resources shape the sustainability of PM implementation. Schools prioritizing ongoing PD, PBC, and MTSS are more likely to maintain high-fidelity PM implementation over time. However, as the study revealed, implementation fidelity likely declines when structured training is not reinforced by continuous PD and coaching, signaling a need for systemic policies and procedures that ensure sustained teacher support.

At the macrosystem level, broader societal influences such as educational policies, funding for early childhood education, and societal attitudes toward PM implementation and SEL play a significant role in shaping the adoption and effectiveness of teacher training programs. The emphasis on reducing preschool suspensions and expulsions aligns with national efforts to promote equitable early childhood education, particularly for children from historically marginalized communities. By embedding SEL-focused interventions like the PM into early education policies, schools are likely to contribute to long-term societal benefits, as children who develop strong social-emotional skills are more likely to succeed academically, build positive relationships, and contribute to their communities as adults.

Finally, the chronosystem underscores how the long-term implementation of PM practices are likely to influence developmental trajectories. Children who participate in PM classrooms are likely to experience immediate benefits in behavior regulation and social skills and may be more likely to carry these skills into elementary school and beyond. Teachers, in turn, are likely to develop greater self-efficacy and job satisfaction, reinforcing positive cycles of professional growth and student success. Over time, the cumulative impact of high-quality SEL instruction through PM implementation in early childhood settings may have the likelihood to shape a generation of emotionally competent, socially responsible individuals, positively influencing broader societal systems.

The findings of this study underscore the interdependent nature of educational ecosystems and the critical role that theory-informed practices play in shaping outcomes across multiple contexts. The PM, grounded in EST and designed as a tiered framework of supports, reflects a comprehensive, systems-level approach to promoting young children's social-emotional development. The training and coaching of teachers in PM practices have the potential

likelihood to create a ripple effect that extends well beyond the classroom and may impact families, school communities, and society at large through the intentional and systematic instruction of social-emotional competencies and evidence-based interventions for children with persistent behavior challenges and other social-emotional needs (Hemmeter et al., 2016).

As an evidence-based MTSS, the PM addresses children's needs through universal promotion strategies, targeted social-emotional supports, and intensive individualized interventions. Its structure aligns closely with Bronfenbrenner's EST, illustrating how coordinated, context-sensitive practices at the microsystem level (e.g., teacher-student interactions) are influenced and supported by mesosystem and exosystem factors such as coaching relationships, leadership support, and family engagement. The PM promotes positive social, emotional, and behavioral outcomes for young children; reduces the reliance on exclusionary discipline practices; fosters meaningful partnerships with families; encourages the use of data for responsive decision-making; and integrates mental health consultation and inclusive practices across early learning environments (Shepley & Grisham-Brown, 2019).

To sustain and scale these benefits, school systems may seek to embed the PM into PD structures, ongoing coaching cycles, and leadership planning. Consistent with EST, this requires alignment across layers of influence from classroom practice to district policy and collaboration among educators, administrators, and external partners. When effectively implemented, the PM serves not only as a framework for individual teacher practice but also as a likely catalyst for systemic transformation in ECE. The study's findings suggest that sustaining the positive impact of the PM depends on strategic investment in high-quality PD, fidelity-focused PBC, and the intentional integration of PM principles into broader school improvement efforts. In doing so, early childhood SEL instruction is likely to become durable, scalable, and a context-responsive

approach to fostering equitable outcomes across all ecological levels of influence.

The findings of this study align with social justice theories that emphasize the importance of equitable access to high-quality early childhood education, inclusive practices, and systemic efforts to reduce bias and disproportionality in disciplinary actions. The PM has been demonstrated to be an effective framework for promoting inclusive preschool environments, particularly for children with disabilities and those from historically marginalized backgrounds. By implementing structured PD and PBC, teachers develop a deeper understanding of supporting SEL for all students while addressing implicit biases that may contribute to exclusionary disciplinary practices. The PM's focus on universal, targeted, and individualized support ensures that all children receive the necessary scaffolding to develop SEL skills and engage positively within the classroom environment. This, in turn, disrupts patterns of exclusionary discipline, such as suspensions and expulsions, which disproportionately impact students of color and those with disabilities (U.S. Department of Education, 2014).

Within systems that implement the PM program-wide, like the setting of this study, teachers in Group 1 received training in PM practices and equity-focused training that included implicit bias awareness and culturally responsive pedagogy. These efforts directly address disparities in disciplinary practices by helping educators recognize and mitigate unconscious biases that may influence their responses to student behavior. Furthermore, ongoing data collection and analysis are integral to PM implementation, ensuring that schools can identify and address disproportionality in discipline. By systematically monitoring TPOT scores and teacher feedback, school leaders and educators can make data-driven decisions to enhance equity and inclusion. Ultimately, by fostering inclusive classroom environments and equipping teachers with tools to support all learners equitably, the PM is likely to contribute to broader social justice

efforts, ensuring the likelihood that early childhood education settings serve as a foundation for lifelong academic and social success for all children, regardless of ability, race, or socioeconomic status.

The results of this study suggest that there is a measurable difference in teacher practice based on whether they received both PM training and PBC versus PBC alone. The findings align with prior research indicating that structured training and coaching lead to greater fidelity in implementing key social-emotional teaching practices. However, this study diverges from much of the existing literature by examining longitudinal trends over five years rather than focusing solely on teacher practice immediately following training and coaching. Previous studies have primarily assessed short-term changes in implementation fidelity following professional development, often within the first year or two of training. In contrast, this study offers a more comprehensive view of how teacher practice evolves, allowing for a differentiated comparison between those who received PM training + PBC and those who received PBC alone across multiple years.

One of the most notable findings is that while PBC is likely to improve certain aspects of teacher practice, it is likely less effective than PM training + PBC in sustaining high-quality implementation of social-emotional teaching strategies. The first two years post-training showed an advantage for the PM training + PBC group, with higher TPOT scores indicating more consistent fidelity in teaching social-emotional skills. However, after this period, scores began to decline, raising questions about whether the natural impact of time post-training contributed to the decline or whether external factors, such as the COVID-19 pandemic, disrupted implementation fidelity. Given that the pandemic introduced unprecedented challenges to education, including shifts to remote learning, disruptions in classroom routines, and increased

teacher stress, it is inconclusive whether the observed decline in teacher practice was an expected outcome of time elapsed since training or a broader systemic effect of COVID-19 or both. This uncertainty highlights the need to continue this study, particularly following another round of PM training, to determine whether retraining can restore or sustain previously observed gains in teacher practice. Such a follow-up study would provide critical insights into the long-term sustainability of PM implementation and the role of ongoing professional development in maintaining high-fidelity SEL practices in early childhood classrooms.

While the findings suggest the effectiveness of PM training and PBC, some results diverge from previous studies. Notably, the diminishing impact of PM training over time, as indicated by the declining TPOT scores in later years, contrasts with earlier research that reported sustained improvements (Hemmeter et al., 2016). This decline suggests that ongoing support and refresher training may be necessary to maintain the benefits of PM training over the long term. It also highlights the importance of continuous PD to sustain high-quality teaching practices.

## Implications

The findings of this study contribute new knowledge and understanding to the field of early childhood education, particularly in the longitudinal effects of PD and PBC on teacher practice within PM implementation. While prior research has demonstrated the short-term benefits of PM training and coaching, this study extends the field by examining long-term trends over five years. The results indicate that training combined with coaching is more effective than coaching alone, particularly in the two years following training. However, the decline in fidelity over time raises important questions about the sustainability of these practices. It underscores the need for ongoing PD, data-driven decision-making, and systemic support for PBC.

This research provided a comparative analysis of the implementation experiences of teachers with and without PM module training. It highlights the added value of PM training in enhancing teacher practices and managing challenging behaviors. Integrating PM training with PBC can lead to more effective and sustained improvements in early childhood education settings. The study extends the literature by examining the long-term impact of PM training and PBC, offering insights into the sustainability of such interventions.

The difference in teacher survey responses highlighted the value of incorporating PM module training into teacher development programs. The PM module training enhanced teachers' readiness to adopt more intensive instructional strategies, such as re-teaching or practicing expected behaviors. These strategies are more constructive and better aligned with a restorative approach to behavior management, fostering a supportive and growth-oriented classroom environment.

These findings are likely to have implications for school leaders in structuring PD schedules, maintaining training logs, and ensuring ongoing support for teachers and instructional coaches. Administrators should establish consistent systems for onboarding new staff, tracking PD participation, and identifying which staff members need training and how frequently it should be delivered to maintain implementation fidelity. This includes using TPOT scores to plan targeted refresher training and ensure teachers receive continued coaching and reinforcement beyond the initial training phase. Additionally, instructional coaches play a pivotal role in sustaining high-quality implementation, and school leaders must prioritize professional development for coaches as well and be sure to provide adequate time and resources, and support their overall efforts to guide teachers effectively.

Beyond instructional planning, the study's findings may inform budgeting and financial decision-making in ECE. Training and coaching require a significant investment of time and resources, yet this research demonstrates their likely effectiveness in improving teacher practice, thus likely helping to foster equitable, inclusive learning environments. School leaders should strive to make data-informed decisions on resource allocation, ensuring that funding is directed toward evidence-based professional learning models that yield long-term benefits for teachers and students. Moreover, teachers consistently expressed a need for ongoing training and support, highlighting sustained PD's role in teacher retention and job satisfaction. Investing in high-quality PD and coaching is likely to improve instructional quality and student outcomes. It may contribute to greater teacher retention by providing educators with the tools and support needed to navigate early childhood education challenges.

While this study provides insights into the impact of PM training and PBC on teacher practice over five years, several limitations must be acknowledged, and caution is needed when attempting to generalize the findings to a broader population. One key limitation is the small sample size. This study focused on 20 preschool teachers within a single public school district, limiting the extent to which the findings can be applied to more extensive or diverse preschool settings. Given that teaching practices, school structures, and student demographics vary widely across districts and states, additional research with a more prominent and representative sample is necessary to determine whether similar trends in teacher practice sustainability and fidelity of PM implementation are observed elsewhere. Generalizability is further constrained by the specific context of this study, which included teachers working in a program that had received extensive support for PM implementation. Schools or programs that have not adopted program-wide PM implementation or do not have access to ongoing coaching resources may experience

different outcomes.

Another consideration is potential researcher bias in the data collection and interpretation process. While every effort was made to ensure objective measurement of teacher practices, the TPOT assessments were completed by trained observers, introducing the possibility of unintentional bias during data collection. Furthermore, there were changes in the coaching staff that were trained as TPOT reliable observers over the course of the study. Additionally, the open-ended teacher survey responses were subject to self-reporting biases, as teachers may have been inclined to respond that they believed they were favorable or reflective of expected implementation rather than their actual day-to-day experiences.

Another major limitation is the longitudinal nature of this study, which presents both an advantage and a challenge in interpreting the results. Unlike previous research, which primarily examined teacher practice immediately following training and PBC, this study captured trends over five school years, allowing for a deeper analysis of how implementation fidelity changed over time. The data revealed that PM training + PBC was most effective in the two years following training, after which scores began to decline. However, it remains inconclusive whether this decline was solely due to the natural passage of time post-training or whether the COVID-19 pandemic significantly disrupted teacher practice, coaching cycles, and PD opportunities. The pandemic caused significant interruptions in educational settings, including remote learning, shifts in instructional priorities, and increased teacher burnout, all of which may have affected the sustainability of PM implementation. Given this uncertainty, further research is needed to examine whether teachers who receive another round of PM training can sustain high levels of practice for extended periods without disrupting a global pandemic.

Overall, while this study contributes important insights to the field of ECE, its findings should be interpreted cautiously. It highlights the importance of continued PD, PBC, and systemic support. However, further longitudinal studies, especially post-COVID-19, are necessary to determine the long-term impact of PM training and PBC on teacher practice and student outcomes. Future research should follow a cohort of teachers who receive PM training and PBC, monitoring their practice over an extended period to assess whether ongoing coaching and refresher training can mitigate the decline observed in this study.

Within program-wide PM implementation, teachers receive equity-focused training, including implicit bias awareness and culturally responsive teaching practices. These efforts are critical in reducing the disproportionate discipline rates often seen in early childhood education settings. A key element of the PM framework is the emphasis on data collection and analysis to monitor and address disparities in discipline outcomes. Schools that implement systematic TPOT assessments can use this data to identify trends in discipline disparities and refine PD strategies accordingly. This study underscores the importance of ongoing PD and data-driven decision-making to ensure teachers receive the necessary support to maintain high-quality SEL instruction and inclusive teaching practices. By fostering inclusive classrooms and equipping educators with tools to support all students equitably, this research contributes to social justice efforts, reinforcing that ECE must serve as a foundation for equity, access, and positive developmental outcomes for all children, regardless of ability, race, or socioeconomic background.

Furthermore, culturally responsive leadership is deeply connected to the PM, as both emphasize equity, inclusivity, and the creation of supportive environments that honor diverse backgrounds. Leaders in schools that implement the PM can actively disrupt systemic barriers by ensuring that teachers receive continuous training and coaching to foster inclusive classroom

practices. By reinforcing SEL early, PM classrooms serve as a foundation for lifelong academic and social success, helping students grow into engaged, emotionally competent individuals who contribute positively to their communities. The study's findings highlight the transformative potential of PD and PBC in enhancing teacher practice.

## Recommendations for Future Research

While this study provides insights into the longitudinal effects of PM training and PBC on teacher practice, several gaps in the research emerged, highlighting important areas for future study. Teacher feedback throughout the implementation remains an underexplored area. While this study included teacher survey responses, future research could incorporate structured interviews, focus groups, or reflective journaling over multiple years to capture teachers' evolving experiences and perceptions of PM implementation. This would provide richer qualitative data on the barriers to sustained fidelity, including workload constraints, administrative support, and changes in school policies that may affect implementation. Such an approach also helps to identify patterns in teacher needs for refresher training and inform the development of more personalized, adaptive PD models that respond to teachers' real-time challenges.

Future research could explore the role of family perceptions and experiences about teacher practice and PM implementation. Given that SEL extends beyond the classroom, gathering family feedback would provide valuable insights into how teacher practices influence student behavior and emotional development at home. A key area of investigation could be whether families of children in classrooms with higher TPOT scores report more positive experiences, such as improved emotional regulation, decreased challenging behaviors, and stronger home-school connections. By integrating family surveys or interviews into future

studies, researchers could assess whether higher PM implementation correlates with greater family satisfaction and engagement, further reinforcing the importance of sustaining high-quality SEL practices in ECE.

A significant gap also lies in understanding the longitudinal effects of PM training on teacher practice post-COVID-19. The decline in TPOT scores in the later years of this study could be due to natural implementation decay or pandemic-related disruptions in education. Future research should continue to track teachers' practice post-training in a more stable educational environment, following another round of PM module training in the recently revised modules to determine if teachers can sustain high levels of practice without the external disruptions experienced during the pandemic.

Finally, further research on PM implementation at scale is needed. Most studies, including this one, focus on individual schools or districts. However, future studies could examine statewide or multi-district implementation to understand how systemic factors such as policy mandates, funding structures, and administrative support influence the sustainability of PM training and PBC. By expanding the research scope, findings can better inform policymakers and education leaders on best practices for scaling and sustaining PM implementation across diverse educational settings.

The researcher's role in this study was deeply connected to implementing and evaluating the PM framework, which presents strengths and potential biases in the research process. Having served as both a preschool teacher and instructional coach within the program before transitioning into an administrative role, the researcher had firsthand experience observing the impact of PM strategies on teacher practice and student outcomes. Before receiving PM training, the researcher admits that teaching preschool was significantly more challenging, as managing

student behavior and fostering SEL lacked a structured framework. Learning and applying PM strategies transformed teaching practices as lived and observed by the researcher. They provided evidence-based techniques to support student self-regulation, emotional competency, and positive classroom interactions.

During the time spent as an instructional coach, the researcher actively supported teachers through PBC and conducted baseline TPOT assessments at the beginning of the PM implementation process. The researcher's coaching efforts from the 2016–2017 through the 2019–2020 school year allowed for observing teachers' growth toward implementation fidelity, reinforcing the effectiveness of PM as a model for ECE. However, as a researcher examining these outcomes, there was a potential for bias, given the substantial professional investment in the program's success. To mitigate this bias, quantitative TPOT scores gathered from multiple coaches were used as an objective measure of teacher practice, reducing the potential for subjective interpretation of teacher growth.

Additionally, the researcher's transition into an administrative role within the program introduced another possible influence on the research findings. While the teacher survey responses were anonymous, the fact that an administrator distributed them may have created a response bias, as teachers could have felt inclined to provide socially desirable responses rather than fully candid feedback. To mitigate this, anonymity and confidentiality in survey distribution were emphasized, and teachers were encouraged to provide honest reflections about their experiences with PM training and PBC. Furthermore, using a program implementation evaluation study approach, where qualitative teacher feedback was analyzed alongside quantitative TPOT data, helped to ensure that subjective perspectives did not overshadow measurable trends in teacher practice over time.

Reflecting on the research process, it became evident that firsthand experience with implementing the PM offered valuable insights into its practical application. It also necessitated rigorous objectivity in data collection and analysis. Efforts were made to reduce bias and ensure that findings were rooted in empirical evidence rather than personal investment through standardized assessment tools, anonymous feedback mechanisms, and a data-driven approach. Future research should continue to examine PM implementation through independent evaluations to validate its effectiveness in improving ECE outcomes further.

In conclusion, this study provided insights into the PM and PBC's implementation experience in ECE. The findings suggest the importance of comprehensive training and ongoing support in enhancing teacher practices and promoting equitable learning environments. By addressing the challenges and support needs identified in this research, educators and policymakers can better implement and sustain effective social-emotional and behavioral interventions, ultimately contributing to more just and inclusive educational outcomes for all young children.

**Next Steps**

Based on the findings of this study, one clear and actionable next step is to strengthen the connection between school districts and institutions of higher education through mutually beneficial partnerships. As supported by Duane et al. (2025), collaborative efforts between universities and districts can lead to the development and implementation of credit-bearing professional learning experiences specifically targeted to the needs of in-service educators. For early childhood educators, these experiences could focus on PM practices and applying evidence-based strategies to support SEL and address challenging behavior in young children.

The qualitative data collected in this study revealed that educators are eager for more practical, immediately applicable PD and focused on strategies for promoting SEL and managing challenging classroom behaviors. Teachers strongly desired to build their confidence and capacity in these areas. Pre-service education may have left gaps in preparation related to behavior management and SEL skill development because, all too often, teachers are not equipped to implement key practices to support SEL skills and address challenging behavior, which can lead to increased teacher stress, decreased job satisfaction, teachers leaving the field and children not equitably getting the support they need to be successful in school. In some programs, this can even lead to the suspension or expulsion of preschool students, and research has shown potentially harmful long-term effects of those exclusionary disciplinary practices. Furthermore, those exclusionary disciplinary practices often affect at-risk children from minority populations, raising social-justice concerns. Providing targeted, ongoing training not only supports teachers in feeling more effective in their practice but also has the potential to enhance outcomes for children and families. When educators have consistent opportunities to learn and implement SEL practices, children benefit from the continuity of quality instruction that provides conditions correlated with children's improved academic performance and prosocial behavior.

To move forward, school leaders, higher education faculty, and policymakers should consider designing and piloting PD programs in partnership with universities that result in academic credit or lead to micro-credentials or certifications. These programs should be tailored to address the gaps that the teachers identified in the qualitative data gathered in this study, emphasizing the need for more PM training for teachers, support staff such as teacher assistants, and families so all adults can learn specific strategies for supporting SEL skills and addressing challenging behaviors. Such initiatives could create a sustainable model of embedded

professional learning that supports current workforce needs and informs improvements to pre-service teacher education.

By bridging the gap between theory and practice and between preparation and performance, this approach honors educators' professional voices while advancing PM implementation systemwide, positively impacting young children and the adults who care for them.

**Novel Result**

A novel and compelling finding that emerged from this research is the potential role of teacher mindfulness in successfully implementing SEL programs such as the PM. While the quantitative data in this study supports the impact of PD and PBC on teacher practice, in the year that classrooms achieved the highest average of TPOT key practices, teachers voluntarily participated in a multi-week, after-school mindfulness program that focused on stress reduction, breathing techniques, and relaxation strategies to enhance their emotional regulation. It is important to note that this mindfulness training was not part of the formal PM installation or required implementation components, and its inclusion occurred independently. At that time, the program leadership practiced mindfulness and saw a critical need for it within her staff. In reflecting on the data, the researcher draws a speculative inference that mindfulness training may have supported teachers' capacity to manage their emotions, enhancing their ability to implement PM practices with greater fidelity. This relationship, however, warrants further investigation to determine its true impact.

This inference is supported by Schonert-Reichl (2017), who emphasized the importance of educators' social and emotional competence in effective SEL implementation. According to her research, teachers' SEL capacities influence not only their classroom management and

relationships with students but also their ability to model prosocial behavior and consistently implement SEL practices. She asserts that "when teachers possess social and emotional competence, they are more likely to create classroom environments that are emotionally safe, well-managed, and conducive to learning" (Schonert-Reichl, 2017). The mindfulness training in this study helped teachers build those competencies, thus enhancing their ability to carry out the key practices required by the PM. This raises a question for future studies: Could mindfulness-based interventions act as a mediating factor that enhances the effectiveness and sustainability of SEL frameworks in early childhood settings?

Moreover, the data also reveals the difficulty some teachers experienced in maintaining key PM practices over time. This is a challenge that warrants immediate and ongoing attention. While initial PD and coaching proved effective, sustained fidelity was not universal, suggesting a need for more ongoing, embedded support structures. Schonert-Reichl (2017) underscores that one-off training is insufficient, and long-term success depends on continuous professional learning that includes attention to teacher well-being. Embedding mindfulness practices into PD may represent an innovative way to address gaps in social-emotional competence and promote consistency in SEL delivery. Future implementation efforts may benefit from intentionally integrating mindfulness alongside PD and coaching, creating a holistic system of support that enhances both teacher effectiveness and student outcomes. These efforts rely on ECE leaders and innovative thinkers to re-design pre-service and in-service teacher PD to make sustainable positive change that benefits all members of the ECE system.

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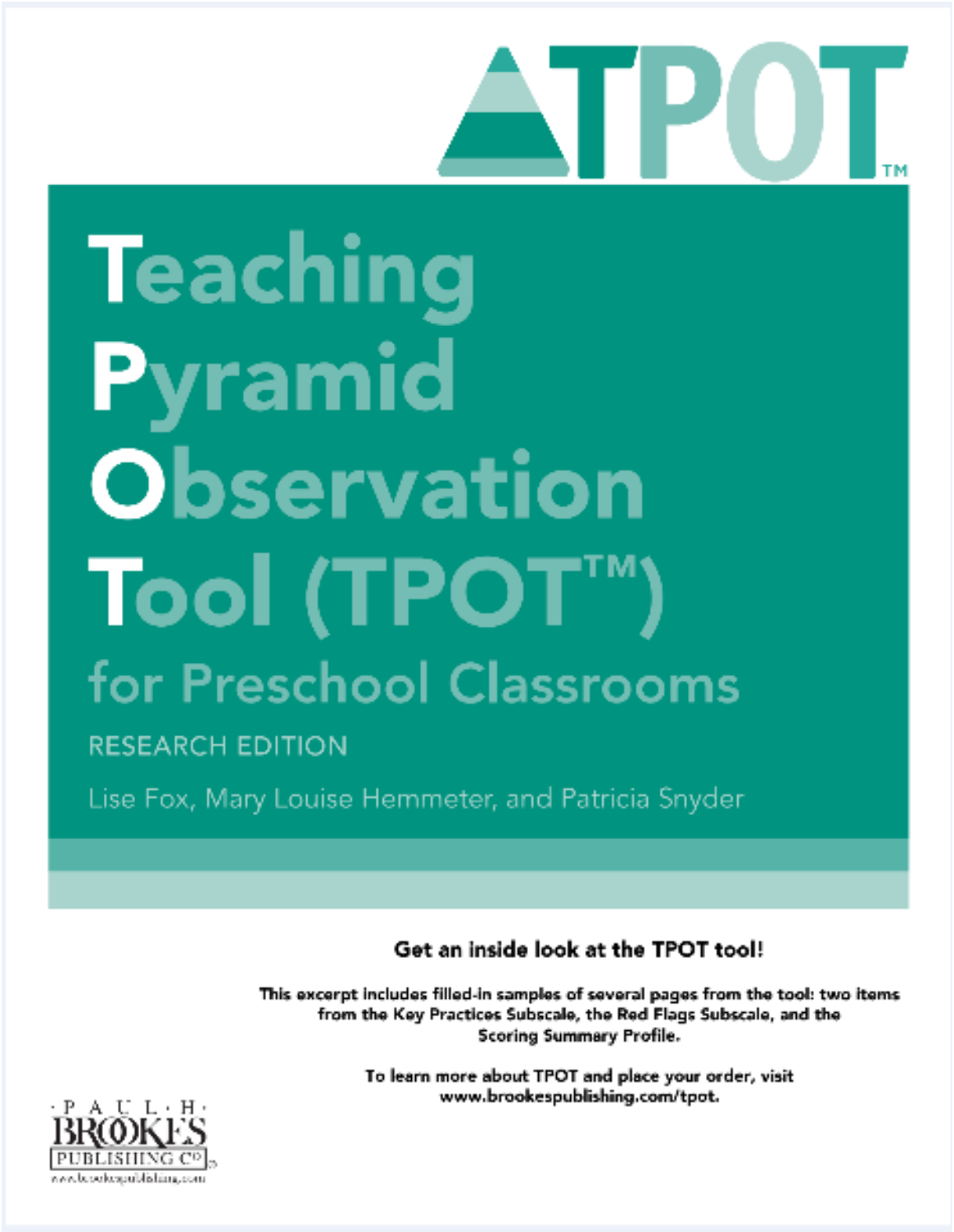
## APPENDIX A

### Teaching Pyramid Observation Tool



SUBSCALE 1: Key Practices

TPOT

## 1. Schedules, Routines, and Activities

| | INDICATOR | YES | NO | |
|---|---|---|---|---|
| SR1 | Teacher has a posted classroom schedule of daily activities. | X | | |
| SR2 | Posted schedule is at children's eye level and includes visual representation of daily activities. | X | | |
| SR3 | Teacher-directed activities are 20 minutes or shorter. | X | | |
| SR4 | Both large- **AND** small-group activities occur during the observation. | X | | |
| SR5 | Teacher reviews the posted schedule with children **AND** refers to it throughout the observation. | X | | |
| SR6 | Teacher structures activities so that there is a clear beginning, middle, **AND** end. | | X | |
| SR7 | A balance of child-directed **AND** teacher-directed activities occur during the observation. | X | | |
| SR8 | If needed, the teacher prepares children when changes are going to occur within the posted schedule. *(Score N/O if you have no opportunity to observe.)* | X | | N/O |
| SR9 | Teacher only continues with a specific teacher-directed activity when the majority of children are actively engaged **AND** interested. | X | | |
| SR10 | Children who need extra support are prepared for activities using an activity schedule **OR** individualized cues at the beginning of activities. | X | | |
| | TOTAL: | 9 | 1 | |



NOTES:

- Removable daily schedule with photographs.
- Good balance of teacher-directed and child-directed.
- Circle and small group lacked a clear middle and end, some children seemed confused.

SUBSCALE 1: Key Practices

TPOT

## 2. Transitions Between Activities Are Appropriate

| | INDICATOR | YES | NO | NOTES |
|---|---|---|---|---|
| TR1 | Teacher supports children's transitions. | X | | |
| TR2 | Whole-class warnings are provided prior to the majority of transitions. | X | | |
| TR3 | Teacher has transition strategies that ensure children are actively engaged in the transitions. | X | | |
| TR4 | Teacher explicitly teaches children the steps **AND** expectations of transitions. | X | | |
| TR5 | Teacher provides positive, descriptive feedback to children who engage in a transition appropriately. | | X | |
| TR6 | Instruction to begin the transition is provided to a child in an individualized way. | X | | |
| TR7 | Teacher effectively guides individual children who need extra support during the transitions. | X | | |
| TR8 | During transitions, the majority of children are actively engaged, including children who are waiting for the next activity. | | X | |
| | TOTAL: | 6 | 2 | |

NOTES:

- Feedback provided during transition was only corrective.
- Children waiting for the art activity were not provided with anything to do and became disruptive

SUBSCALE 2: Red Flags

ATPOT

## Red Flags

The following are "red flags" and may represent issues related to teacher training and support or to program policies and procedures. To be scored Yes, the red flag should signify a problematic practice in need of immediate attention. Each red flag practice listed below is contraindicated in the *Pyramid Model*.

| | PRACTICES | YES | NO |
|---|---|---|---|
| 15 | The majority of the day is spent in teacher-directed activities. | | X |
| 16 | Transitions are more often chaotic than not. | | X |
| 17 | Teacher talk to children is primarily giving directions, telling children what to do, reprimanding children. | | X |
| 18 | During group activities, many children are **not** engaged. | | X |
| 19 | Teachers are not prepared for activities before the children arrive at the activity. | | X |
| 20 | Children are reprimanded for engaging in disruptive or problem behavior (frequent use of "no," "stop," "don't"). | X | |
| 21 | Children are threatened with an impending negative consequence that will occur if disruptive or problem behavior persists. | X | |
| 22 | Teacher reprimands or admonishes children for expressing their emotions. | | X |
| 23 | Emotions are never discussed in the classroom. | | X |
| 24 | Teacher rarely encourages interactions between children during play or activities. | | X |
| 25 | Teacher gives directions to all children in the same way without giving additional help to children who need more support. | | X |
| 26 | Teacher tells children mostly what **not** to do rather than what to do. | | X |
| 27 | Learning centers do not have clear boundaries. | | X |
| 28 | There are large, wide-open spaces in the classroom where children can run. | | X |
| 29 | Teacher reports asking for the removal of children with persistent challenging behavior from the classroom or program. | | X |
| 30 | Teacher makes comments about families that are focused on the challenges presented by families and their lack of interest in being involved. | | X |
| 31 | Teacher restrains a child when engaging in problem behavior or secludes the child in an area separate from the classroom where the child cannot see the activities of the classroom. | | X |
| | TOTAL: | 2 | 15 |

SCORING SUMMARY PROFILE

TPOT

Date: 1/4/2014 Start time: 9:00 am

Teacher ID: 01234 End time: 11:30 am

Observer ID: 56789

Directions: Write the number of items scored yes in column A and the number of items scored no in column B. Complete the calculations to derive a percentage score for each item.

**Subscale 1: Key Practices**

| TPOT Item | | A. Number of indicators scored yes | B. Number of indicators scored no | C. Total possible (A + B) | Score (A / C * 100) |
|---|---|---|---|---|---|
| 1 | Schedules, Routines, and Activities* | 9 | 1 | 10 | 90 |
| 2 | Transitions Between Activities Are Appropriate | 6 | 2 | 8 | 75 |
| 3 | Teachers Engage in Supportive Conversations with Children* | 8 | 2 | 10 | 80 |
| 4 | Promoting Children's Engagement* | 7 | 2 | 9 | 78 |
| 5 | Providing Directions | 5 | 2 | 7 | 71 |
| 6 | Collaborative Teaming* | 7 | 2 | 9 | 78 |
| 7 | Teaching Behavior Expectations | 6 | 1 | 7 | 86 |
| 8 | Teaching Social Skills and Emotional Competencies | 7 | 1 | 8 | 88 |
| 9 | Teaching Friendship Skills | 8 | 1 | 9 | 89 |
| 10 | Teaching Children to Express Emotions | 7 | 1 | 8 | 88 |
| 11 | Teaching Problem Solving | 6 | 3 | 9 | 67 |
| 12 | Interventions for Children with Persistent Challenging Behavior | 3 | 2 | 5 | 60 |
| 13 | Connecting with Families | 7 | 1 | 8 | 88 |
| 14 | Supporting Family Use of the Pyramid Model Practices | 6 | 1 | 7 | 86 |
| Total Key Practices | | 92 | 22 | 114 | 81% |

**Subscale 2: Red Flags**

| | | | | | |
|---|---|---|---|---|---|
| 15 – 31 | Red Flags | 2 | 15 | 17 | 12% |

**Subscale 3: Using Effective Strategies to Respond to Challenging Behavior**

| 32. Using Effective Strategies to Respond to Challenging Behavior | |
|---|---|
| Number of incidents of challenging behavior observed: | 2 |
| All essential strategies used in each incident: | ☐ Yes ☒ No ☐ N/A |
| Number of additional strategies used: | ☐ 1 ☐ 2 ☐ 3 ☐ 4 |

*This item includes N/O as a score option for one indicator. If the indicator is scored as N/O, exclude it from your counts of total Yes and total No.

# APPENDIX B

## Participants' Responses for PM Impact on Teaching Practices

| Group 1 | Group 2 |
|---|---|
| **Discussion of implementing specific PM strategies**<br>Teachers reported using PM training strategies such as scripted stories, the Turtle Technique, visual cues, and solution cards to explicitly teach social-emotional skills and manage challenging behaviors. They noted increased preparedness, improved implementation of individualized behavior support plans, and the value of collaborative coaching, data-driven decision-making, and creating safe, supportive classroom environments.<br><br>Example quotes:<br><br>*"Through the Pyramid Model training I've learned useful strategies to implement practices for challenging behavior into my teaching practice. The methods and strategies (scripted stories, Turtle Technique, visual cues, solutions cards, books to teach social emotional skills, etc.) I've learned and put into practice in my classroom and it has been of great support when addressing challenging behavior. The strategies suggested are based on data collected during the observations. The trainings were shown to significantly improve the implementation of the Pyramid in my classroom. Most importantly, reductions in problem behavior in observed challenging behavior among the students in my classroom, including managing emotions, friendship skills, problem solving, self-regulation and anger management."*<br><br>*"The pyramid model training focuses on social emotional and behavioral development. It has impacted my teaching practice in a positive way, especially with students with challenging behavior. It has turned me into a classroom observer. This behavioral intervention model helps me implement an individualized behavior support plan, monitor the students progress by collecting data, and at the same time follow the classroom schedule. I have created a classroom environment where my students feel safe and happy while also receiving individualized support."* | **Discussion of building positive relationships**<br>Teachers emphasized building positive relationships as the foundation for classroom management and the proactive prevention of challenging behaviors. They highlighted the importance of mindful interactions and supporting social-emotional development, while several expressed a need for additional PM module training, especially on managing challenging behaviors.<br><br>Example quotes:<br><br>*"The pyramid model has helped me understand and focus on building relationships as the strong foundation for my classroom environment and to focus on the positive behaviors and to be proactive to try to prevent as many challenging behaviors. ¨*<br><br>*"Pyramid Model has helped me become more aware of my interactions with my students. It has taught me to build positive relationships with my students and my students with their peers. I appreciate how the Pyramid Model magnifies the importance of the child's social and emotional behavior in a day in age where academics are strongly embedded in schools."*<br><br>*"Pyramid Model training has helped me build stronger relationships with co-workers, children, and families and helped me focus on the positives."* |

## APPENDIX C

### Participants' Responses Regarding Support from Coaching

| Group 1 | Group 2 |
|---|---|
| **Discussion of the impact of coaching on reflective practice and professional growth**<br><br>Teachers valued the constructive feedback and collaborative approach provided by coaching and noted that coaching helped them reflect on their practices and identify areas of growth. Specific examples included being made aware of effective strategies and feeling supported in addressing challenging behaviors. Coaches provided non-judgmental feedback and promoted problem-solving through open-ended questions, fostering a reflective teaching practice.<br><br>Example quotes:<br><br>*"Practice-Based Coaching has helped tremendously in my teaching practice. The support provided by the coaches is invaluable. It has been very useful in addressing the social-emotional, as well as academic needs of the students in my classroom. One of the biggest challenges for me as a teacher has always been managing challenging behavior. I feel that when it is not properly managed, it can really affect the whole atmosphere of the classroom. I really appreciate the constructive feedback given during our debrief. The approach that guides our discussions is based on a common goal instead of who is the expert. My coach doesn't just conduct observations and make a list of things for me to implement. I feel that the feedback given by the coach is not judgmental and gives me the opportunity to identify areas of growth. Also, I find that the use of open-ended questions is very helpful to me because it helps me look deeply into my teaching practice and further my strength and promotes problem-solving.* | **Discussion of coaching as a source of support and teamwork**<br><br>Teachers appreciated the teamwork aspect and felt that coaching provided targeted support for specific issues in their classrooms. Several responses highlighted the importance of feeling part of a supportive team, with coaching helping them manage immediate classroom challenges.<br><br>Example quotes:<br><br>*"The practice-based coaching has helped me feel like part of a team that is there to support me in my teaching practices and has helped me with whatever specific issues are going on in my classroom at that time."*<br><br>*"Practice-based coaching has taught me the importance of collaborating with a team for the benefit of my students."* |

| | |
|---|---|
| *Also, I like the way in which coaches write quotes in the coaching log instead of a narrative-type document. I feel that this strategy provides authentic and transparent evidence of what's going on in my classroom, which helps me tremendously because I can mirror my teaching practice and reflect on it."*<br><br>*"Practice-Based Coaching has impacted my teaching in a positive way. It guides and supports us teachers into using effective teaching practices. A teacher should always be open to new ideas/strategies. Having that support makes the classroom run smoothly. Having a collaborative partnership with a coach provides effective feedback which promotes fidelity of practice implementation. My school coaches are my support system. They help me come up with strategies, provide positive description, feedback, contribute new ideas, collect data and most importantly support the students' families use of the Pyramid Model Practices. "* | |

## APPENDIX D

### Participants' Responses Regarding Challenges in Implementation

| Group 1 | Group 2 |
|---|---|
| **Discussion of the challenges of TPOT implementation and the need for collaborative planning**<br><br>Teachers highlighted the complexity of the TPOT assessment and the need for more frequent planning with support staff. Specific responses noted feeling overwhelmed by the TPOT tool and the challenges in coordinating with assistant teachers to implement the model effectively.<br><br>Example:<br><br>*"The only thing that comes to mind is using the TPOT assessment tool, which has a lot of components to follow, especially the interview questions. This assessment/checklist feels overwhelming and too much to focus on at once, especially when being observed. During a short observation not everything on the assessment may be observed even though the practices may be used throughout the day/week."*<br><br>*"One of the challenges experienced in Pyramid Model implementation is being able to meet frequently to plan with other support staff (assistant teacher), in order to implement pyramid modules with fidelity."* | **Discussion of challenges related to parental collaboration and the need for comprehensive staff training**<br><br>Teachers pointed out issues with parental cooperation and the need for more training for all staff, including paraprofessionals and floating teacher assistants. Specific responses emphasized the lack of consistency at home affecting classroom behavior and the insufficient training provided to support staff.<br><br>Example:<br><br>*"Need more training, especially paraprofessionals and floaters."*<br><br>*"The challenge for me is when parents are not willing to cooperate and follow up with strategies."*<br><br>*"Not having all the training yet."*<br><br>*"Not all staff understand and know the Pyramid Model."* |

# APPENDIX E

## Participants' Responses Regarding Perceived Benefits of Implementation

| Group 1 | Group 2 |
|---|---|
| **Discussion of the positive impact on classroom management, student behavior, and social-emotional growth**<br><br>Teachers reported positive impacts on classroom management and student behavior and noted significant improvements in children's social-emotional skills and reductions in challenging behaviors. They emphasized the creation of a safe and supportive classroom environment, as well as the ability to provide individualized support for children.<br><br>Example quotes:<br><br>*"It provided strategies to address challenging behaviors from the beginning of the school year."*<br><br>*"Pyramid Model has given me the resources to teach social emotional skills explicitly. I feel more prepared in managing challenging behavior since I have consistent resources I can refer to and rely on. "*<br><br>*"Teaching appropriate behaviors and self-control is crucial to help children develop the skills necessary to be successful in school. The Pyramid Module provides teachers resources to tools needed to continue supporting these students who display challenging behavior in the classroom."*<br><br>*"The program consists of practices implemented by teachers and families. It focuses on social emotional skills which are crucial for early childhood. It creates relationships between teachers and students and teachers and families. Overall, the program is great."* | **Discussion of strengthening relationships and fostering a positive classroom environment**<br><br>Teachers found the Pyramid Model useful for building stronger relationships and creating a positive classroom environment. They highlighted improved relationships with co-workers, children, and families as a key benefit.<br><br>Example quotes:<br><br>*"The Pyramid Model in Pre-K is fantastic because it gets the children more prepared for the future and it improves the teacher's quality of teaching."*<br><br>*"I am more confident at making decisions that impact my students because I have more of an understanding of their needs."*<br><br>*¨Pyramid Model has helped me build stronger relationships with co-workers, children, and families and helped me focus on the positives."*<br><br>*"It gives you ways to work with challenging behaviors to help prevent them."* |

## APPENDIX F

### Participants' Responses Regarding Support Needed

| Group 1 | Group 2 |
|---|---|
| **Discussion of enhancing family engagement, staff training, and structured implementation**<br><br>Teachers expressed a need for more workshops for families to help them implement Pyramid Model practices at home, additional training for paraprofessionals, and structured timelines for implementing skills.<br><br>Example quotes:<br><br>*"If possible, holding more workshops for families to help them at home use the Pyramid Model resources. For example, how to make a visual schedule, how to make a calm down corner, how to use positive language with children, etc. Allow for make & take resources to be made they can use at home as well.*<br><br>*Providing more training for paraprofessionals using the pyramid model to provide an overall understanding of why we use the Pyramid model and how it is effective with students. "*<br><br>*"If possible, similar to the Second Step curriculum, a weekly timeline of when to implement new skills/resources to help narrow down teaching specific skills."* | **Discussion of expanding training for effective implementation**<br><br>Teachers requested Pyramid Model training and role-playing scenarios for better understanding of strategies. They highlighted the need for specific training modules on addressing challenging behaviors and suggested role-play exercises as a practical learning tool.<br><br>Example quotes:<br><br>*"*To have the Pyramid Module training, specifically the one on addressing challenging behaviors.*"*<br><br>*"Trainings."*<br><br>*"Being trained in all modules."* |

# APPENDIX G

## William Paterson University IRB

THE WILLIAM PATERSON UNIVERSITY OF NEW JERSEY

**INSTITUTIONAL REVIEW BOARD FOR HUMAN SUBJECT RESEARCH**

c/o Office of Sponsored Programs
1800 Valley Road, Room 222
973-720-2852 (Phone)
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Chair: Professor Michelle Gonzalez (GonzalezM77@wpunj.edu)
College of Education
Contact: Kate Boschert (irbadministrator@wpunj.edu)
Office of Sponsored Programs

To: Raquel Lima
Doctoral Candidate of Education (EdD) in Leadership

From: Michelle Gonzalez

Subject: IRB Determination: Exempt Review

Study: Protocol # 2024-325: An Examination of Pyramid Model Implementation to Support Preschool Teaching Practices.

Date: March 14, 2024

The IRB has reviewed the above study involving humans as research subjects. **This study was determined to be Exempt from further review under Category: Exempt 45 CFR 46.104(d)(2)(i) and (d)(d)(iii);** special class of subjects: None. However, you must still submit protocol modifications to the IRB.

IRB Number: This number is WPU's IRB identification that should be used on all consent forms and correspondence.

Review Date: 03/14/24

**Revisions/Modifications:** You are required to carry out this research as described in the protocol. All amendments/modifications of protocols involving human subjects, must have prior IRB approval, except those involving the prevention of immediate harm to a subject. Revisions/Modifications are to be submitted through InfoReady at https://wpunj.infoready4.com/.

**Adverse Effects/Unanticipated Problems:** The principal investigator must report immediately any serious problem, adverse effect, or outcomes that are encountered while using human subjects or any complaints from your subjects. In addition, the principal investigator must report any event or series of events that prompt the temporary or permanent suspension of a research project involving human subjects or any deviations from the approved protocol using the Adverse Effects Form. Adverse Effects, Unanticipated Problems, and Modifications for the prevention of immediate harm to subjects must be reported within 24 hours to the IRB using the Adverse Effects Form: https://www.wpunj.edu/osp/irb/irb-forms.html.

**Consent Form**: All research subjects must use the approved Informed Consent Form. You are responsible for maintaining signed consent forms (if approved for Active Consent format) for each research subject for a period of at least three years after study completion.

# VITA

Raquel Lima

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Bachelor of Arts, Manhattan College, 2009