Using Peer Supports to Improve Positive-to-Negative Teacher/Student Interaction Ratios by Novice Teachers

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USING PEER SUPPORTS TO IMPROVE POSITIVE-TO-NEGATIVE TEACHER/STUDENT INTERACTION RATIOS BY NOVICE TEACHERS

By

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A DISSERTATION

Submitted in Partial Fulfillment of the
Requirements for the Degree of
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A critical teacher shortage continues to exist throughout the United States. Challenges with student behavior and classroom management are identified as a top reason for teacher attrition. Educational research has demonstrated that PreK-12 students who receive social-emotional-behavioral support through evidence-based classroom management (EBCM) practices are more likely to achieve academic success. When teachers deliver high ratios of positive interactions to their students, positive student outcomes are likely to occur. However, researchers have consistently found that, like other EBCM practices, this low-intensity, high impact practice is typically implemented at significantly lower levels than necessary to promote positive student outcomes. This implementation gap has been recognized as a critical need for future research by many leading scholars in the education field. Novice teachers are often at a significant disadvantage due to often minimal explicit teaching of positive student behavior support in preservice programs and their limited experience in the field. The goal of this single-case non-concurrent randomized multiple baseline study design was to bridge this gap by developing a feasible, inexpensive intervention to support novice teachers to effectively improve their ratios of positive-to-negative teacher/student interactions. Two dyads, four participants, engaged in a multi-component intervention package within a peer-coaching model incorporating access to
readily available resources, peer-based performance feedback, and a gradual fading of intervention support. This study occurred in school settings throughout the COVID-19 pandemic which significantly disrupted educational contexts. While results of the study did not show a significant positive effect of the intervention, three out of four of the participants demonstrated increases their positive-to-negative teacher/student interaction ratios. Additionally, participants within each dyad showed similar trends, indicating that the dyad may be a critical component of the intervention. Qualitative data pointed to additional features of the intervention that served as potential reinforcers for participants. These insights are shared as implications for future research, practice, and policy.
DEDICATION

I am a firm believer that people come into our lives for a reason. Long ago I had given up on ever being able to achieve my dream of getting a Ph.D. Not long after we met, Dr. Jen Freeman reminded me “‘It’s impossible,’ said pride. ‘It’s risky,’ said experience. ‘It’s pointless,’ said reason. ‘Give it a try,’ whispered the heart.” Thank you for being my inspiration, guide, and friend.
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CHAPTER ONE

INTRODUCTION

Teaching requires juggling many urgent demands, blending of numerous competencies, and constantly navigating changing landscapes including shifting student populations and frequent new initiatives. Teachers are charged with moving their assigned student populations towards academic achievement and social competence while addressing the unique, complex, diverse needs of each student (Dicke et al., 2015; Harmsen et al., 2018). Each year, novice teachers, defined as teachers within the first three years of their career, arrive in schools expected to successfully transition from preservice teacher with limited practice to an independent and fully functioning teacher of record expected to make a positive impact at the onset of their career. Novice teachers quickly realize that creating a positive learning environment, supporting prosocial student behavior, and providing effective instruction requires vast knowledge along with fluency in a wide array of essential skills (Dicke et al., 2015; Feldon, 2007).

Current theory and research literature demonstrate that students who receive behavioral and social-emotional support, alongside effective instruction, are more likely to experience academic achievement and engage in prosocial behavior (Myers et al., 2011; Rathel et al., 2014; Sugai & Horner, 2002). A wealth of research exists documenting the core features, essential skills, necessary dosage, and implementation fidelity of evidence-based classroom management practices (EBCM) known to promote desirable student outcomes (Carr et al., 2002; Cooper et al., 2018; Dicke et al., 2015; Närhi et al., 2017; Office of Special Education Programs, 2015; Rathel et al., 2014; Reinke et al., 2008; Simonsen et al., 2008). In essence, we know what to do and how to use EBCM practices to promote prosocial student behavior, engage students in learning, and intervene to address interfering problem behavior effectively. Yet, despite the substantial
advances in behavioral support and intervention, a significant implementation gap between empirical evidence and actual practice has been recognized as a critical need for future research (Cook et al., 2019; Fixsen et al., 2013; Horner & Sugai, 2018; Sanetti & Collier-Meek, 2019). Novice teachers are often at a significant disadvantage due to their minimal applied experience paired with a lack of explicit teaching and practice with EBCM strategies within their teacher preparation program (Chesley & Jordan, 2012; Eisenman et al., 2015; Flower et al., 2017; Freeman et al., 2014). As a result, novice teachers often struggle with classroom management and meeting the social-behavioral needs required for student achievement (Dicke et al., 2015; Harmsen et al., 2018).

**Problem Statement**

It is reported that 40-50% of new teachers leave the field within the first five years of their career (Ingersoll et al., 2018; Raue & Gray, 2015). When teachers leave the field early in their careers, they take with them the investment of time, energy, and financial resources attributed to their teacher preparation, and the in-school support and professional development invested in their development go unutilized. This scenario is especially problematic when teacher shortages are being identified throughout the nation (Aragon, 2016). Challenges with student behavior and classroom management are often identified as one of the top reasons for novice teachers to leave the classroom (Ingersoll et al., 2018; Skaalvik & Skaalvik, 2011). This identification is not surprising, considering novice teachers are often minimally exposed to EBCM strategies in their preservice training (Freeman et al., 2014). A review of teacher preparation programs and state accreditation policies indicated 96% of responding elementary and secondary education programs include classroom management content but, only 66% of
these programs showed evidence of teaching EBCM practices. Furthermore, only 54% of states required instruction in EBCM for teacher certification (Freeman et al., 2014).

The limited opportunity to improve capacity with EBCM strategies continues at the onset of their career due to the often minimal and haphazard induction of novice teachers in most contexts (Harmsen et al., 2018). While many schools provide mentorship to novice teachers, there is no guarantee that chosen mentors are effective classroom managers (Hannan et al., 2015). In a recent survey of 248 teachers across four states, almost 30% self-reported having no formal training and did not claim to use EBCM practices within their classrooms (Cooper et al., 2018). Mentors are often assigned to novice teachers because they are in the same grade level or department, close to the novice teacher’s classroom, previously trained to be a mentor, or simply available and willing to take on the role (Ingersoll & Strong, 2011). Additionally, novice teachers are rarely provided formal professional development in much-needed EBCM practices (Harmsen et al., 2018; Helms-Lorenz et al., 2016; Raue & Gray, 2015).

Since limited resources such as funding and time are ongoing challenges in schools, it is essential to increase novice teachers’ use of EBCM strategies in a feasible, inexpensive and effective way. Fortunately, an abundance of free and readily available resources for teachers to learn about EBCM practices exists (MO SW-PBS, 2016; Office of Special Education Programs, 2015; Reinke, 2013). However, novice teachers are typically unaware of these resources, and gaining knowledge is only one step in the learning process. There is also minimal available time to learn new information due to the workload associated with teaching. To implement new and durable practices with fidelity, teachers need practical and efficient interventions embedded within effective professional development systems, including explicit instruction, modeling,
opportunities for practice, performance feedback, and gradual fading of supports (Cavanaugh, 2013; Hannan et al., 2015; Sayeski et al., 2019; Simonsen et al., 2017).

Yet, as primary service providers, teachers are vital links between theory and practice. Leading experts within the fields of prevention science (Cook et al., 2019), implementation science (Fixsen et al., 2013; Sanetti & Collier-Meek, 2019) and positive behavior support in schools (Horner & Sugai, 2018) have established a need for bridging the research-to-practice gap. Cooper et al. (2018) emphasized:

The gap between the identification of EBCM practices and their subsequent use in classrooms continues to be one of the most vexing issues in the field of education and it has a negative impact on students, particularly students with disabilities. (p. 23)

For schools to maximize the recognized benefits of EBCM practices, critical research needs to continue to move from the adoption, development, and efficacy of EBCM practices to dissemination and feasible, sustainable implementation fidelity within school contexts. (Cook et al., 2019; Fishbein et al., 2016). Instead of providing complex, multi-faceted, time-intensive programs and interventions, future research should strive to disseminate the “evidence-based kernels” (Biglan, 2015; Embry & Biglan, 2008) or necessary “active ingredients” (Horner & Sugai, 2015, 2018), which maximize effectiveness, but also allow implementer flexibility within a dynamic school or classroom environment (Lyon & Bruns, 2019). For example, increasing the number of positive and decreasing negative teacher/student interactions is an effective, low-intensity strategy connected to positive student outcomes, which allows for adaptability within individual contexts (Caldarella et al., 2020). Furthermore, research on interventions and practices using natural implementers, rather than researchers, may help to address the need for greater contextual fit within the school environment and promote generalization (Lyon & Bruns, 2019).
Bridging the gap between an existing evidence-base and actual sustainable implementation in schools requires multiple efforts such as improving the contextual fit of chosen evidence-based practices, developing systems to support the use and maintenance of EBCM practices with fidelity, and improving the delivery of professional development (Darling-Hammond & McLaughlin, 2011; Horner & Sugai, 2018). This proposed study leverages novice teachers as potential agents for linking a robust evidence base with practitioners at a crucial time of need.

**Research Questions**

Using a three-term contingency framework, I aim to determine if novice teachers will increase their use of evidence-based classroom management practices and, therefore, increase their ratio of positive student/teacher interactions after engaging in an intervention package. More specifically, I want to examine the following research questions:

1. **What are the effects of a peer-coaching intervention package using explicit instruction, action planning based upon habit development, opportunities for practice, and performance feedback on novice teachers' ratio of positive-to-negative student/teacher interactions?**

2. **Does gradual fading of peer-based performance feedback maintain an improved positive to negative student/teacher interaction ratio?**

**Background of Study**

**Theoretical Framework**

This study has been conceptualized based upon the three-term contingency model frequently used to provide positive behavior support and cultivate behavior change (Carr et al., 2002; Cooper et al., 2020). According to Cooper et al. (2020), “Applied behavior analysis, or
ABA, is a scientific approach for discovering environmental variables that reliably influence socially significant behavior and for developing a technology of behavior change that takes practical advantage of those discoveries.” (p. 2). In a seminal article, Baer et al. (1968) identified the significant components inherent to ABA, including focusing on observable, measurable, relevant behavior targeted for change. Behavioral theory recognizes that behavior occurs within a context. It is influenced by antecedents, events which occur prior to a behavior, and consequences, events following a behavior (Skinner, 1953). Thus, behavior can be shaped, and the occurrence of future behavior is impacted by contingent reinforcers. To change a behavior, one must understand what maintains the targeted behavior before effective manipulations of the environment can be determined (Cooper et al., 2020).

**Typical antecedent conditions.** Each day in the classroom, novice teachers find themselves in “survival mode” as they navigate an abundance of competing demands for their attention, including instructing, monitoring student progress, interacting with colleagues, maintaining professional responsibilities, planning for future lessons, etc. (Dicke et al., 2015; Feldon, 2007). Meanwhile, examples of appropriate and inappropriate student behavior are likely to be continuous and unpredictable (Sugai & Horner, 2002). Competing demands and unpredictable student behavior serve as the antecedent stimuli for novice teacher behavior.

**Typical novice teacher behavior.** When confronted with interfering student behavior, many teachers will likely utilize reprimands (negative interactions), rather than proactive and reinforcing responses such as praise statements (Reinke et al., 2013). This approach becomes problematic when paired with findings by Moos and Pitton (2014), indicating that student teachers were aware of an increased tendency to rely on automatic responses while in unpredictable and unpracticed situations. The student teachers also realized their ability to
modify their teaching lessened with increased tasks and demands. Converging these findings suggests that teachers, especially novice teachers, are likely to engage in behaviors that effectively and efficiently lead to reinforcement based upon a previous learning history rather than being intentional with their professional practices.

**Typical consequences.** Undesired novice teacher behavior, identified as negative teacher/student interactions, is typically maintained because the student’s behavior either discontinues, often only temporarily, or escalates leading, to the student’s removal from the classroom. In both cases, the teacher has escaped the aversive situation, and the teacher’s use of negative interactions has been reinforced, increasing the probability of recurrence and perpetuating a less than ideal classroom environment (Sugai et al., 2000).

**Intervention logic.** Novice teachers are essentially developing habits of practice that are likely to be maintained throughout their careers. I hope to decrease the novice teacher’s typical response to inappropriate student behavior (negative interaction) and increase the use of praise (positive interaction) as a response to appropriate student behavior. I seek to change the targeted behavior by providing an intervention, based upon empirically sound, effective professional development theory, which includes: (a) capacity development of EBCM practices; (b) use of habit development techniques; and (c) performance feedback with a goal of maintained behavior change.

Manipulating the target behavior's antecedent and consequence conditions will likely lead to the novice teacher’s newly acquired skills being reinforced. Opportunities for reinforcement need to occur over a long enough period of time that automaticity of response is established, and durable behavior change is maintained. Thus, I include explicit instruction on habit development as a part of the treatment package. In other words, we want teachers to be able to respond with
positive responses even when they are overwhelmed, and we can do this by providing training and support for them when they are novice teachers to habituate positive EBCM practices. Figure 1.1 presents the three-term contingency model and the strategy manipulations, to be explained later in this paper, which I plan to include with this intervention.

Figure 1.1

*Three-term Contingency (Cooper et al., 2020) and Intervention Manipulations*

![Contingency Model Diagram]

**Significance of Study**

As stated previously, simply being able to identify EBCM practices is not sufficient. Rather, teachers must use the practices consistently and at high enough levels for the effect of the practices to impact student outcomes. At this early stage, novice teachers are beginning to utilize strategies and form habits that are likely to be perpetuated throughout their careers (Feldon, 2007). Providing a timely intervention at the start of their career may result in durable behavior change for this vital population. If they are provided evidence-based professional development designed to promote maintenance of these vital practices, novice teachers may be a population
particularly well-suited to implement EBCM practices with fidelity which can lead to student achievement.

Implementing EBCM practices with fidelity also benefits the teacher. Teachers who develop competency in classroom management and responding to student behavior are apt to be less stressed and overwhelmed, better able to address student needs, and more successful in navigating the complexities of the teaching profession (Skaalvik & Skaalvik, 2011). Furthermore, teachers who use ECBM practices have reported greater job satisfaction (Reinke et al., 2013, 2015), improved career outlook (Helms-Lorenz et al., 2016), greater teacher self-efficacy (Kelm & McIntosh, 2012), and more enduring teacher effectiveness (Fallon et al., 2019). This, in turn, may help to lessen teacher attrition rates (Harmsen et al., 2018; Ingersoll et al., 2018). Therefore, proactively bridging the research-to-practice gap by intervening to improve novice teachers’ implementation of EBCM strategies may support student achievement and be a way for schools to maximize their investment and increase the likelihood of improving teacher retention.

**Definition of Key Terms**

*Evidence-based Classroom Management Practices*

Five key areas of evidence-based classroom management practices including (a) maximizing structure and routines, (b) posting and teaching 3-5 positively-stated expectations, (c) promoting active student engagement, (d) developing a continuum of strategies (i.e., explicit teaching and positive feedback) to encourage the desired behavior, and (e) developing a continuum of corrective strategies to discourage inappropriate behavior have been well established within the extant literature. (Simonsen et al., 2008).
**Positive-to-Negative Interaction Ratio**

Interactions between teachers and students fall into three broad categories (a) positive, (b) negative, and (c) neutral. Positive interactions include general and specific praise and non-verbal gestures such as smiles, nods, thumbs up, etc. Negative interactions include general and specific verbal reprimands or gestures indicating disapproval such as shaking head, “teacher looks,” etc. Neutral interactions include verbal and non-verbal directives, responses to questions, and asking questions. This study focuses on only verbal statements. To determine the positive-to-negative interaction ratio, positive statements will be divided by negative statements to develop the ratio.

**Multi-component Treatment Package**

Meaningful and effective learning requires multiple experiences and opportunities to gain knowledge, practice, and receive performance feedback. The literature on educator professional development is abundant with the delivery of multi-component treatment packages to support change in educator behavior. This study continues the practice of combining relevant components and creating a treatment package to be applied to novice teachers to promote sustained use of EBCM strategies.
CHAPTER TWO

REVIEW OF THE LITERATURE

A review of recent articles by leading experts within the fields of prevention science (Cook et al., 2019), implementation science (Fixsen et al., 2013; Sanetti & Collier-Meek, 2019) and positive behavior support in schools (Horner & Sugai, 2018), has established a need for bridging the research-to-practice gap. For example, Cook et al. (2019) worked recently to adapt intervention strategies to a school context; however, when addressing future research needs, the authors stated, “researchers should examine experts’ and practitioners’ perceptions of the feasibility and impact of strategies to identify those that are low burden to deploy yet likely to influence EBP [evidence-based practices] implementation.” (p. 19). The social validity of EBPs is a necessary but often overlooked factor in the current literature and likely contributes to the implementation gap. Evidence of this gap is shown through surveys of school-based practitioners. For example, 75% of school psychology training programs report providing coursework on EBPs yet, 89% of school psychologists claim to rarely or never actually use EBPs within the field (Sanetti & Collier-Meek, 2019). In another example, 25% of students with emotional-behavioral disorders (EBD) reportedly spend about 80% of their school day within the general education setting (Beam & Mueller, 2017). However, a national study across contexts indicated only 57% of general educators believed they were adequately prepared, 65% felt adequately skilled, and only 39% considered themselves adequately trained to meet the needs of students experiencing EBD disorders. Within the same study, 31% of the general educators claimed a below-average understanding of positive behavior support, and only 32% identified an average understanding of bully prevention (Beam & Mueller, 2017). Critical research needs to continue to move from adoption, development, and efficacy of EBPs to dissemination and
feasible, sustainable implementation fidelity within school contexts. (Cook et al., 2019; Fishbein et al., 2016).

**Positive-to-negative Interaction Ratio**

The primary focus of this study is to increase novice teachers’ levels of positive interactions with students while decreasing their levels of negative interactions. Touted frequently as an EBCM practice with low-intensity but high impact, positive teacher/student interactions have been shown to serve as a reinforcer and acknowledgement of desired student behavior. Therefore, it serves as a logical and feasible choice for this study.

In a recent three-year study involving 151 classrooms across three states, Caldarella et al. (2020) found a linear relationship between positive student-to-teacher interaction ratios and student on-task behavior. As teachers increased their praise and decreased their levels of reprimands, students stayed more attentive to their classwork. The impact of teacher/student interactions has also been shown to have long-term effects. In a study spanning nine schools, findings determined that high levels of negative teacher feedback in the fall, predicted undesirable student behavior outcomes, such as disruptive behavior and emotional dysregulation, in the spring. Conversely, positive teacher feedback in the fall predicted improved prosocial behavior in the spring (Reinke et al., 2008).

The ratio of positive-to-negative interactions is referenced within the literature in many fields such as marriage counseling (Gottman & Levenson, 1999), interpersonal relationships (Flora, 2000), and organizational leadership (Daniels & Bailey, 2014). Furthermore, there is a lack of empirical support regarding the exact ratio needed for positive and optimal effects (Sabey et al., 2019). However, a 4:1 or 5:1 ratio is commonly used as a goal within educational literature. Regardless of the exact ratio, it is well-established that increasing positive
teacher/student interactions and decreasing negative interactions improves student outcomes 
(Caldarella et al., 2020; Cook et al., 2017; Cooper et al., 2018; Reinke et al., 2014)

Effective Professional Development

Teacher professional development typically falls into one of three areas: content knowledge (what teachers know); teaching practices (what teachers do); and strategic teaching (how teachers use what they know to inform what they do) (Kennedy et al., 2016). Kennedy (2016) found that professional development focused on strategic teaching has the greatest positive impact on teacher effectiveness and was most likely to positively impact teacher effectiveness after the formal professional development work has ended. Additionally, unlike one-shot training that is often considered ineffective, professional development packages allowing teachers multiple opportunities through coaching structures to practice, receive feedback, and reflect upon their learning provided relevant, sustainable teacher learning (Cavanaugh, 2013; Cook et al., 2017; Darling-Hammond et al., 2017; Kennedy et al., 2016; Reinke et al., 2008; Simonsen et al., 2017). After a review of 35 studies that demonstrated connections between professional development and positive impacts for teachers and students, Darling-Hammond et al. (2017) identified seven core features for effective professional development. Effective professional development (a) is content focused, (b) incorporates active learning, (c) supports collaboration, (d) uses models of effective practice, (e) provides coaching and expert support, (f) offers feedback and reflection, and (g) is of sustained duration. Balancing those core features in a feasible way given resource constraints such as time, funding, prioritization, and alignment with other initiatives is a perennial dilemma within school contexts. Due to the ongoing emphasis on academic achievement, this dilemma is especially true when
building teacher capacity in positive behavior support and EBCM strategies. Yet, there is evidence that it can be done.

**Effective Professional Development in Evidence-Based Classroom Management Strategies**

Numerous studies have demonstrated how teacher behavior can be altered and lead to positive student outcomes. Improving teacher competency and use of EBCM strategies, such as delivering high levels of behavior-specific praise statements (BSP), opportunities to respond (OTR), and a ratio of high positive to low negative interactions, can be increased through multi-component professional development packages, including explicit instruction, modeling, prompting and performance feedback (e.g., Briere et al., 2015; Fallon et al., 2019; Hagermoser-Sanetti et al., 2018; Johnson et al., 2017; Simonsen et al., 2017). Aligning multi-component intervention packages with the core features of effective professional development (Darling-Hammond et al., 2017) may be a way to achieve higher fidelity of EBCM strategy use in teachers. The following sections provide insight into each core feature of effective professional development within the context of EBCM strategy implementation.

**Content focus.** When professional development embeds instructional strategies associated within specific curriculum content such as literacy, social studies, math, or science, teachers are better supported to enact their new learning (Darling-Hammond et al., 2017). To date, there are limited demonstrations of braiding implementation of EBCM strategies within content-specific curriculum domains. Some intervention studies have been conducted specifically during common instructional times (e.g., inclusion math classes in Duchaine et al., 2011); however, the practices such as delivering specific praise statements and opportunities for students to respond were not explicitly linked to the mathematics curriculum. Future research endeavors in multi-tiered systems of support (MTSS) may want to consider ways to more
intentionally connect EBCM practices with an academic curriculum to support more effective professional development.

**Active learning.** According to Darling-Hammond et al.’s (2017) review, active learning is defined as:

Active learning engages teachers directly in designing and trying out teaching strategies, providing them an opportunity to engage in the same style of learning they are designing for their students. Such professional development uses authentic artifacts, interactive activities, and other strategies to provide deeply embedded, highly contextualized professional learning. This approach moves away from traditional learning models and environments that are lecture based and have no direct connection to teachers’ classrooms and students. (pg. 1)

This definition is quite similar to Archer and Hughes (2010) explanation of explicit instruction as “systematic, direct, engaging and success-oriented” (p. vii). Explicit instruction includes modeling, supported practice, and independent practice to teach new skills and strategies.

Upon reviewing the literature on teacher implementation of EBCM practices, it was notable that many of the successful interventions incorporated an element of active learning for the participants. That is, the professional development required as part of the intervention moved away from lecture-based learning and instead incorporated opportunities for participants to role-play, practice, and action plan for implementation of EBCM practices. For example, Simonsen et al. (2017) found that teacher levels of BSP increased after teachers were provided brief targeted professional development and weekly email prompts combined with self-monitoring and reporting of their data. Also, in a study by Cook et al. (2017), teachers significantly improved their ratios of more positive than negative interactions with students after receiving training via a
model-lead-test approach and prompting through a technological device while completing a self-monitoring log. Providing teachers with opportunities to use active learning strategies to improve their teaching may lead to more durable teacher behavior change.

**Collaboration.** For decades, teachers entered their classrooms, engaged with their students, and completed all the planning and preparation in isolation. Within the past 10-15 years, the field has seen a shift towards professional learning communities, communities of practice, and team-based instructional planning in the interest of providing better support for students. Darling-Hammond et al. (2017) claimed that the same shifts should occur for teacher learning. When professional learning is paired with opportunities for collaboration, ideas can be shared, positive impacts can be experienced, and learning can be strengthened (Darling-Hammond et al., 2017; Owen, 2015; Trust & Horrocks, 2017).

When seeking to increase or improve teacher implementation of EBCM strategies, nesting the professional development within a school or grade-level community may be an effective way to provide opportunities for collaboration. When a school embarked on a universal classroom management training (Incredible Years Classroom Management Program), teacher affiliation, defined as a teacher’s sense of connections to peers and the school community, was more influential on the fidelity of implementation and positive student outcomes than collegial leadership (Sebastian et al., 2019). This points to peer collaboration as being a significant ingredient in professional development for EBCM strategy implementation. Briere et al. (2015) capitalized upon collaboration as a mechanism for effectively supporting novice teachers to increase their use of BSP by using mentors within the school as coaches. In this study, novice teachers and mentor pairs used a combination of self-management, regularly scheduled meetings, and performance feedback to shape the levels of BSP statements provided to students (Briere et
al., 2015). According to social validity measures, the novice teachers found the intervention to be worthwhile and something they would recommend to other novice teachers.

**Models of effective practice.** When acquiring new knowledge and skills, models can be an effective method to solidify understanding and as a lever to move towards enacting a new skill (Archer & Hughes, 2010; Webb et al., 2019). Providing models of effective practice, identified as another core feature of effective professional development (Darling-Hammond et al., 2017), is well utilized within interventions targeting teachers’ use of EBCM strategies and, in some cases, has been identified as an active ingredient in multi-component intervention packages.

In a study conducted by Bethune and Wood (2013), teachers were provided professional development on the implementation of function-based interventions for students with severe disabilities. At first, teachers were provided specific instructions on how to implement the intervention; however, they were unable to successfully generalize their acquired knowledge to their classrooms until they received coaching support that incorporated a model of the function-based intervention being implemented (Bethune & Wood, 2013). The significance of modeling was also noted when teachers implemented the evidence-based Good Behavior Game (Embry, 2002) at a school-wide level. Coaches supporting implementation utilized repeated modeling as an effective mechanism to support teachers who struggled with reaching implementation fidelity because they perceived that demonstration of the skills was necessary. Once that modeling occurred, implementation fidelity increased (Bethune & Wood, 2013). A similar result was found by Fallon et al. (2019) with teachers implementing comprehensive classroom management plans. Verbal modeling was introduced to the intervention as a part of intensive booster training when teachers could not achieve fidelity. Implementation fidelity not only improved but also
sustained. The researchers claimed, “Specifically, verbal modeling may have reinforced what was previously taught and offered teachers a clear example of how to implement each step. These results lend support to the notion that more comprehensive supports seem to more effectively change teacher behavior.” (p. 12). The addition of modeling after content delivery has been noted as a way to enhance implementation of not only comprehensive classroom management plans (Hagermoser-Sanetti et al., 2018), but also as support to increase use of evidence-based classroom management practices (Kennedy et al., 2016). When developing a multi-component intervention package, models of effective practice appear to be not only an active ingredient but also the connection that is sometimes needed for teachers to make their newly acquired skills become a part of their classroom practice.

Coaching and expert support. Coaching is widely considered an effective and necessary tool used by individuals seeking to develop a new skill or behavior. It is routinely employed by athletes but is becoming more commonly used as a change mechanism for workplaces, organizations, and individuals (Jones et al., 2016). Coaching, defined as “the one-on-one sharing of expertise about content and evidence-based practices, focused directly on teachers’ individual needs” (p.1), is yet another core feature identified as a component of effective professional development for teachers (Darling-Hammond et al., 2017).

Intervention studies for teacher use of EBCM strategies have demonstrated how coaching can support teachers to increase usage and improve the fidelity of these key strategies (e.g., Bradshaw et al., 2018; Briere et al., 2015; Fabiano et al., 2018; Myers et al., 2011; Reinke et al., 2014a; Wehby et al., 2012). In several cases, teacher behavior change was not seen after training events that were primarily content-delivery, but change did occur when a coaching component was added to the intervention package (e.g., Freeman et al., 2018; Thompson et al., 2012).
Recognizing the significance of coaching as a support for teachers, I conducted a systematic review of the literature, which will be explained later in this chapter.

**Peer coaching.** Utilizing experts within the school community or peers to support the implementation and learning process can be an alternative for schools challenged with bringing in external experts to serve as coaches due to lack of access or funds. This approach can have mixed effects. Gilmour et al. (2017) examined the difference in fidelity of implementing a universal classroom management plan between teachers supported by a school-based coach versus a university-based coach. Not surprisingly, the school-based coaches struggled to maintain the recommended frequency of coaching visits, and in one case, no coaching sessions ever occurred. Throughout the intervention phase of the study, the teachers receiving support from university-based coaches maintained higher levels of implementation quality and fidelity than those paired with school-based coaches (Gilmour et al., 2017).

In contrast, a recent study (Johnson et al., 2017) examined the effects of a professional development package on improving positive teacher/student interactions in a preschool setting. The professional development package included explicit instruction of strategies, directed observations by peers with follow-up conferences, and multiple whole school meetings to discuss and progress monitor the teacher learning experiences and impacts. In comparison to the control group schools, which received just the explicit instruction workshops, the schools using peer-coaching and whole school meetings experienced significantly higher ratios of positive teacher/student interactions as well as classroom organization and productivity measures. Therefore, it was determined that including social learning opportunities, such as peer-coaching and whole school meetings, increased implementation of the learning. In addition, the teachers reported that the intervention was manageable, relevant, and beneficial to themselves and their
students (Johnson et al., 2017). The power of a peer-coaching model lies not only in its ability to promote the successful implementation of a new skill. As long as the matched peers are in non-evaluative roles and are of equal status, a peer-coaching dyad can also support developing collegial relationships, promote accountability, increase commitment to implementing new skills, and create a bridge between research and practice (Johnson et al., 2017; Latz et al., 2008; Ma et al., 2018; Pearce et al., 2019; Soisangwarn & Wongwanich, 2014).

Clearly, there are varied outcomes from using school-based coaching support. Both the advantages and disadvantages must be considered when plans are made to deliver an intervention to teachers. However, it is important to remember that many schools may not be able provide coaching to their teachers in any other way so utilizing peers and other internal coaches may be a viable alternative with its own set of benefits.

**Feedback and reflection.** In a review of the literature, Cavanaugh (2013), identified that teacher levels of OTRs and BSP can be improved with performance feedback. Additionally, performance feedback had positive effects on teacher use of reinforcement and preventative classroom management skills (Akalin & Sucuoglu, 2015). Simonsen et al. (2017) also found that adding performance feedback after training in prompts, OTRs, and BSP had a functional relationship to teacher’s increased use of the targeted EBCM skill.

Performance feedback allows teachers to see their progress, or lack of progress, and make data-based reflections about their skill development (Reinke et al., 2014a). Interventions involving self-management also promote opportunities for reflection. This has been demonstrated effectively through the use of Excel spreadsheets (Simonsen et al., 2017), self-monitoring fidelity checklists (Oliver et al., 2019), and video self-modeling (Thompson et al., 2012). Just as Darling-Hammond et al. (2017) claimed, these methods of self-reflection as well
as opportunities to receive performance feedback from a coach or peer demonstrate this as a core feature of effective professional development for teachers.

**Sustained duration.** The final core feature recommended for effective professional development is sustained duration (Darling-Hammond et al., 2017). While much of the existing literature shows promising results regarding increasing teacher use of EBCM practices, many of the studies show that generalization and maintenance of newly learned behaviors are either minimal or undetermined (Cavanaugh, 2013; Cook et al., 2017; Kennedy et al., 2016; Reinke et al., 2008; Simonsen et al., 2017). As stated previously, within the extant literature, there are numerous examples of studies used to build the behavioral support knowledge and skill capacity of educators (Cavanaugh, 2013; Cook et al., 2017; Kennedy et al., 2016; Reinke et al., 2008; Simonsen et al., 2017). However, each of these studies mentions the need for future research to determine if the knowledge and skill development maintains over time and generalizes to different contexts. Also, Horner and Sugai (2018) recognized this as a crucial need in the future directions of positive behavior support research when they declared:

> Research that describes not just how to get initial effects but also how to get effects that occur across the full range of settings, times, and conditions experienced by children, families, and staff is underrepresented. Achieving an understanding of how to support individuals with problem behavior so we achieve socially valued outcomes will require more attention to conceptual and design efforts focused on generalization and maintenance. This is a particularly important concern within PBS literature. While a compelling body of scholarship describing generalization and maintenance of newly acquired skills exists, little is available to describe how we may best generalize and maintain the reduction of problem behavior. (p. 21)
When developing behavioral skills in teachers, we need to focus on building capacity that is effective, efficient, relevant and durable so we can continue to decrease the existing implementation gap. Therefore, interventions that are provided should consider ways to extend over time rather than being short-lived trainings and workshops (Hagermoser-Sanetti et al., 2018). This is especially true for teachers who need additional support to successfully implement ECBM practices (Reinke et al., 2014a). Considering the continuous challenge with balancing sustained duration of interventions in busy school contexts, embedding habit development into teaching practices maybe a way to support fluency, maintenance, and generalization over time.

_Habit formation._ Pairing behavioral theory with habit learning has been recognized as a key next step in behavior change interventions (Marteau et al., 2012). In his book, The Power of Habit, Duhigg (2012) synthesized seminal research by Desrochers et al. (2010) and other crucial scientific evidence around habit formation and change. He presents the concept of stimulus control within the context of a “habit loop” to support changed behavior. Basically, a cue within the environment, leads to a behavioral routine which leads to a reward. Over time, the behavioral routine is strengthened and becomes a more automatic response, especially in times when intentional decision-making is limited. Wood and Runger (2016) assert that bad habits are often the underlying cause of behavior change and developing a ready response for when people are overwhelmed, stressed, or distracted may improve the likelihood of a behavior intervention being successful. Novice teachers certainly fit these criteria. Creating a habit loop where novice teachers respond positively to student behavior, even when overwhelmed, will hopefully support an enduring, effective habit of practice throughout their career. When this habit loop is embedded in interventions intended to bridge the gap between research and practice and is also aligned with the core features of effective professional development, we have the potential to
promote durable positive behavior change within teachers which will lead to desirable student outcomes (Simonsen et al., 2020).

**Systematic Literature Review of ECBM Intervention Studies Using Coaching**

Considering the numerous intervention studies within the field targeting teacher improvement of ECBM practices, I chose to focus this review on those that involved a coaching component within a multi-component intervention package. Then, I explored how those studies mapped on to the identified core features of effective professional development. In other words, this systematic literature review answered the following research questions:

1. What are the characteristics of intervention studies using multi-component intervention packages with a coaching component to improve K-12 teachers’ use of ECBM strategies?
2. How do the intervention studies using multi-component intervention packages with a coaching component to improve K-12 teachers’ use of ECBM strategies align to core features of effective teacher professional development (Darling-Hammond et al., 2017)?

In the following section, I describe the literature review method, results of the literature review, and implications for practice.

**Method**

I carried out a multi-step process based upon PRISMA guidance and procedures (Page et al., 2020) to find relevant articles for this review. I began by identifying the relevant search terms and electronic library databases. Next, I reviewed all abstracts and coded them for inclusion criteria. This stage of the review was checked for reliability by another reviewer. Then, I screened the remaining full articles for inclusion. Once articles were identified to remain, those articles were coded for the core features of effective professional development (Darling-Hammond et al., 2017). When appropriate, an ancestral search was conducted within the
reference lists of articles meeting inclusion criteria. A flowchart of the process is seen below in Figure 2.1.

Figure 2.1

*Article Search Process According to PRISMA Guidelines*

Electronic Search

Through the library database system, I conducted a search for relevant articles. Within each database, a database thesaurus was used to determine the best search terms for that particular database. The terms "teacher training" OR "teacher education" OR "professional
development") AND ("classroom management" OR "classroom discipline" OR "classroom techniques" OR "student behavior") AND (coach*) NOT (preservice OR pre-service) were used to search three electronic databases, including ERIC, PSYCInfo, and Web of Science. The searches, conducted on July 15, 2020, August 13, 2020, and August 22, 2020 respectively, were limited to scholarly and peer-reviewed articles after 2008. This cutoff date was intentionally chosen because Simonsen et al.’s (2008) seminal work on EBCM practices was published that year. Once duplicates were removed, 1075 abstracts remained for the initial screening. A search alert was enacted through the university library system following initial search results. No additional studies were identified through this alert between the time of activation and writing of this paper.

**Inclusion Criteria**

In addition to being published after 2008, articles had to meet several other inclusion requirements to be considered for this review. The article had to be written in English and needed to demonstrate some type of experimental control. Position papers, literature reviews, descriptive articles, and qualitative studies were not included.

**Participants.** Articles included in this review used participants that were currently employed as classroom K-12 teachers in public school settings. Preservice and preschool teachers were not included in this review. Neither were studies conducted in alternative or private school settings.

**Independent variable.** Inclusion in this review required a multi-component intervention package that explicitly identified coaching as a component. Additional components of the intervention package varied.
**Dependent variables.** Studies included in this review identified teacher use of at least one specific EBCM strategy, identified within Simonsen et al. (2008), as an outcome of the intervention.

**Article Screening Procedures**

*Initial screening.* Once article searches were completed, I then screened 1,075 abstracts to determine if they met inclusion criteria. In many cases (n=913), articles were eliminated because they indicated disqualifying criteria (e.g., preschool, preservice teacher, systematic review, qualitative study) within their title. Additionally, 30% of the 1,075 screened articles (n=323) were reviewed by another reviewer to determine whether or not they met inclusion criteria. 85% interrater reliability was achieved. The 52 articles that did not achieve interrater reliability were then reviewed collectively and 100% agreement was achieved. After that process, 162 abstracts were reviewed to determine if they fit the aforementioned inclusion criteria. This led to 100 articles being removed. If there was a lack of certainty about any inclusion criteria, articles remained on the list for a full article screening.

*Full article screen.* Finally, the full articles (n=62) were screened for the identified inclusion criteria. This process, led to 21 articles remaining that met all inclusion criteria. These studies moved to the full coding process.

*Ancestral search.* Two additional articles were added to this review as result of ancestral searches in included articles. This resulted in a total of 23 articles included within this review.

**Coding Process for Included Articles**

Once articles were identified for this review, I coded all articles to first determine each intervention study’s research design, dependent variable, and whether coaches were internal or external to the school community. Following that, I coded the multi-component intervention
packages to determine if the intervention package included the seven core features of effective teacher professional development identified in Darling-Hammond et al.’s (2017) review.

**Results**

**Research question #1.** What are the characteristics of intervention studies using multi-component intervention packages with a coaching component to improve K-12 teachers’ use of EBCM strategies? The systematic search process found 23 articles that met inclusion criteria. The results for question 1 provide an across studies overview of the characteristics of the participants, coach relationships, settings, and dependent variables. Table 2.1 provides this overview.

**Research designs.** Within this review, only intervention studies that included experimental control were included. Of those reviewed, 39.1% (n=9) were single-case multiple baseline across participants designs (Akalin & Sucuoglu, 2015; Bethune & Wood, 2013; Briere et al., 2015; Duchaine et al., 2011; Fallon et al., 2019; Freeman et al., 2018; Larson et al., 2018; Myers et al., 2011; Thompson et al., 2012), 56.5% (n=13) were experimental designs, involving randomization of individuals or groups (Becker et al., 2013; Bradshaw et al., 2018; Dudek et al., 2019; Fabiano et al., 2018; Gilmour et al., 2017; Hagermoser-Sanetti et al., 2018; Hopman et al., 2018; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Wehby et al., 2012), 4.3% (n=1) was a quasi-experimental design as it did not incorporate randomization (Oliver et al., 2019), and 4.3% (n=1) used randomized multiple treatments embedded within a single-case multiple baseline across participants design (Hagermoser-Sanetti et al., 2018).

**Participant and setting characteristics.** All participants were K-12 teachers in public school settings. All (100%) of the single-case design studies (n=9) had 3-4 participants (Akalin
Within the group experimental design studies, 30.8% (n=4) of the studies had 0-50 participants (Dudek et al., 2019; Gilmour et al., 2017; Hagermoser-Sanetti et al., 2018; Reinke et al., 2013), 38.5% (n=5) of the studies had 51-100 participants (Fabiano et al., 2018; Owens et al., 2017; Reinke et al., 2014a; Reinke et al., 2014b; Wehby et al., 2012), 23.1% (n=3) of the studies had 101-150 participants (Becker et al., 2013; Hopman et al., 2018; Sebastian et al., 2019), and 7.7% (n=1) of the studies had 151-200 participants (Bradshaw et al., 2018). The sole quasi-experimental (n=1) study included within this review had 0-50 participants (Oliver et al., 2019).

Across research designs, 13.0% (n=3) of the studies used internal staff (e.g., school counselors, veteran teachers, instructional coaches) to serve as the coaching role in the intervention package (Briere et al., 2015; Hopman et al., 2018; Larson et al., 2018). 82.6% (n=19) of the studies brought in consultants external to the school community (e.g., researchers, graduate students, former teachers) to serve as the coach (Akalin & Sucuoglu, 2015; Becker et al., 2013; Bethune et al., 2013; Bradshaw et al., 2018; Duchaine et al., 2011; Dudek et al., 2019; Fabiano et al., 2018; Fallon et al., 2019; Freeman et al., 2018; Hagermoser-Sanetti et al., 2018; Myers et al., 2011; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Thompson et al., 2012; Wehby et al., 2012). 4.3% (n=1) of the studies incorporated both internal and external personnel to serve as coaches (Gilmour et al., 2017).

Within this review, 82.6% (n=19) studies occurred in elementary education settings (Akalin & Sucuoglu, 2015; Becker et al., 2013; Bethune & Wood, 2013; Bradshaw et al., 2018; Briere et al., 2015; Dudek et al., 2019; Fabiano et al., 2018; Fallon et al., 2019; Gilmour et al., 2017; Larson et al., 2018; Myers et al., 2011; Thompson et al., 2012; Wehby et al., 2012).
2017; Hagermoser-Sanetti et al., 2018; Larson et al., 2018; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Thompson et al., 2012; Wehby et al., 2012), 21.7% (n=5) studies occurred in secondary education settings (Bradshaw et al., 2018; Duchaine et al., 2011; Freeman et al., 2018; Hopman et al., 2018; Myers et al., 2011), and 8.7% (n=2) studies occurred in special education settings (Bethune & Wood, 2013; Hopman et al., 2018). It is important to note that these characteristics are not mutually exclusive. For example, a study may have occurred within an elementary special education setting or across both an elementary and secondary education setting.

**Dependent variables.** Across research designs, 82.6% (n=19) studies identified teacher levels of praise and/or reinforcement as a dependent variable (Akalin & Sucuoglu, 2015; Bethune & Wood, 2013; Bradshaw et al., 2018; Briere et al., 2015; Duchaine et al., 2011; Dudek et al., 2019; Freeman et al., 2018; Gilmour et al., 2017; Hagermoser-Sanetti et al., 2018; Hopman et al., 2018; Larson et al., 2018; Myers et al., 2011; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Thompson et al., 2012), 52.2% (n=12) studies identified teacher levels of correctives or reprimands as the dependent variable (Bradshaw et al., 2018; Dudek et al., 2019; Freeman et al., 2018; Hopman et al., 2018; Myers et al., 2011; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019), and 17.4% (n=4) studies identified implementation fidelity to an EBCM plan or program as the dependent variable (Becker et al., 2013; Fabiano et al., 2018; Fallon et al., 2019; Wehby et al., 2012).
Table 2.1

**Participant Setting and Dependent Variable Characteristics Across Research Designs**

<table>
<thead>
<tr>
<th>Research Designs</th>
<th>Number of Participants</th>
<th>Coach Relationship*</th>
<th>Setting*</th>
<th>Dependent Variable*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Case Design (9)</td>
<td>3-4: (9)</td>
<td>Internal: (2)</td>
<td>Elementary: (6)</td>
<td>Praise/Reinforcement: (8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>External: (7)</td>
<td>Secondary: (3)</td>
<td>Correctives/Reprimands: (2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Special Education: (1)</td>
<td>Implementation Fidelity: (1)</td>
</tr>
<tr>
<td>Group Experimental (13)</td>
<td>0-50: (4)</td>
<td>Internal: (2)</td>
<td>Elementary: (12)</td>
<td>Praise/Reinforcement: (10)</td>
</tr>
<tr>
<td></td>
<td>50-100: (5)</td>
<td>External: (12)</td>
<td>Secondary: (2)</td>
<td>Correctives/Reprimands: (9)</td>
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<td>101-150: (3)</td>
<td></td>
<td>Special Education: (1)</td>
<td>Implementation Fidelity: (3)</td>
</tr>
<tr>
<td></td>
<td>151-200: (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quasi-experimental (1)</td>
<td>0-50: (1)</td>
<td>External: (1)</td>
<td>Elementary: (1)</td>
<td>Praise/Reinforcement: (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Correctives/Reprimands: (1)</td>
</tr>
</tbody>
</table>

*Note: *results not mutually exclusive

**Study results.** All experimental studies and the quasi-experimental study included both descriptive and inferential statistics as well as reported effect sizes (Becker et al., 2013; Bradshaw et al., 2018; Dudek et al., 2019; Fabiano et al., 2018; Gilmour et al., 2017; Hagermoser-Sanetti et al., 2018; Hopman et al., 2018; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Wehby et al., 2012). All single-case studies used visual analysis (Akalin & Sucuoglu, 2015; Bethune & Wood, 2013; Briere et al., 2015; Duchaine et al., 2011; Fallon et al., 2019; Freeman et al., 2018; Larson et al., 2018; Myers et al., 2011; Thompson et al., 2012) and 13.0% (n=3) reported finding a functional relationship between the intervention and the dependent variable (Bethune & Wood, 2013; Briere et al., 2015; Larson et al., 2018).

Within the 23 studies reviewed, 78.2% (n=18) demonstrated improved teacher behaviors associated with EBCM strategies such as increased praise statements, decreased reprimands, higher implementation fidelity to EBCM plans or programs (Akalin & Sucuoglu, 2015; Becker et
al., 2013; Bethune & Wood, 2013; Bradshaw et al., 2018; Briere et al., 2015; Duchaine et al., 2011; Dudek et al., 2019; Fallon et al., 2019; Gilmour et al., 2017; Larson et al., 2018; Myers et al., 2011; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Sebastian et al., 2019; Thompson et al., 2012; Wehby et al., 2012), 9% (n=2) of the studies reported no improvement (Freeman et al., 2018; Hopman et al., 2018), and 13% (n=3) studies reported mixed results indicating that multiple teacher behaviors were examined with at least one improved teacher behavior and at least one teacher behavior that did not improve (Fabiano et al., 2018; Hagermoser-Sanetti et al., 2018; Reinke et al., 2014b).

**Research question #2.** How do the intervention studies using multi-component intervention packages with a coaching component to improve K-12 teachers’ use of EBCM strategies align to core features of effective teacher professional development (Darling-Hammond et al., 2017)? After reviewing the participant, setting, dependent variable, and results characteristics, I compared the multi-component intervention packages used to change teacher behaviors to the core features of effective teacher professional development (Darling-Hammond et al., 2017). Table 2.2 provides a summary of the results.

**Core features of effective teacher professional development.** All of the studies (n=23) reviewed engaged the teachers in active learning, provided coaching or expert support, and offered feedback or reflection (Akalin & Sucuoglu, 2015; Becker et al., 2013; Bethune & Wood, 2013; Bradshaw et al., 2018; Briere et al., 2015; Duchaine et al., 2011; Dudek et al., 2019; Fabiano et al., 2018; Fallon et al., 2019; Freeman et al., 2018; Gilmour et al., 2017; Hagermoser-Sanetti et al., 2018; Hopman et al., 2018; Larson et al., 2018; Myers et al., 2011; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Thompson et al., 2012; Wehby et al., 2012). 4.3% (n=1) of the studies
connected EBCM practices to content or curriculum (Duchaine et al., 2011), 82.6% (n=19) of the studies used models of effective practice (Becker et al., 2013; Bethune & Wood, 2013; Duchaine et al., 2011; Dudek et al., 2019; Fabiano et al., 2018; Fallon et al., 2019; Freeman et al., 2018; Gilmour et al., 2017; Hagermoser-Sanetti et al., 2018; Hopman et al., 2018; Larson et al., 2018; Myers et al., 2011; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Thompson et al., 2012), 21.7% (n=5) of the studies promoted collaboration with colleagues within the school community (Briere et al., 2015; Gilmour et al., 2017; Hopman et al., 2018; Larson et al., 2018; Oliver et al., 2019), and 78.3% (n=18) of the studies occurred for a sustained duration, defined for this review as greater than four weeks (Akalin & Sucuoglu, 2015; Becker et al., 2013; Bradshaw et al., 2018; Briere et al., 2015; Duchaine et al., 2011; Fabiano et al., 2018; Freeman et al., 2018; Gilmour et al., 2017; Hagermoser-Sanetti et al., 2018; Hopman et al., 2018; Larson et al., 2018; Oliver et al., 2019; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Thompson et al., 2012; Wehby et al., 2012).

**Number of core features included in intervention package.** Across studies, 21.7% (n=5) incorporated four out of seven of the core features of effective teacher professional development (Akalin & Sucuoglu, 2015; Bethune & Wood, 2013; Bradshaw et al., 2018; Fallon et al., 2019; Wehby et al., 2012), 56.5% (n=13) incorporated five out of seven of the core features (Becker et al., 2013; Briere et al., 2015; Dudek et al., 2019; Fabiano et al., 2018; Freeman et al., 2018; Hagermoser-Sanetti et al., 2018; Myers et al., 2011; Owens et al., 2017; Reinke et al., 2013; Reinke et al., 2014a; Reinke et al., 2014b; Sebastian et al., 2019; Thompson et al., 2012), 21.7% (n=5) incorporated six out of seven of the core features (Duchaine et al., 2011; Gilmour et al.,
2017; Hopman et al., 2018; Larson et al., 2018; Oliver et al., 2019), and no studies incorporated all seven of the core features of effective teacher professional development.

Table 2.2

*Intervention Package Alignment to Core Features of Effective Professional Development*

<table>
<thead>
<tr>
<th>Core features of effective professional development</th>
<th>Number of Studies</th>
<th>% of Studies Reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is content focused</td>
<td>1</td>
<td>4.3%</td>
</tr>
<tr>
<td>Incorporates active learning</td>
<td>23</td>
<td>100%</td>
</tr>
<tr>
<td>Uses models of effective practice</td>
<td>19</td>
<td>82.6%</td>
</tr>
<tr>
<td>Supports collaboration with colleagues</td>
<td>5</td>
<td>21.7%</td>
</tr>
<tr>
<td>Provides coaching and expert support</td>
<td>23</td>
<td>100%</td>
</tr>
<tr>
<td>Offers feedback and reflection</td>
<td>23</td>
<td>100%</td>
</tr>
<tr>
<td>Is of sustained duration</td>
<td>19</td>
<td>82.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of core features included in intervention package</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 core features</td>
</tr>
<tr>
<td>5 core features</td>
</tr>
<tr>
<td>6 core features</td>
</tr>
</tbody>
</table>

Discussion of Literature Review Results

Through a systematic review of the literature, I identified studies using a multi-component intervention package including coaching to improve teacher use of EBCM strategies. My first level of review provided a description of study characteristics. Then, I compared intervention packages to the core features of effective teacher professional development identified by Darling-Hammond et al. (2017).

Characteristics of the Empirical Literature

Across studies, there was a wide range of number of participants (range = 3-158) with far more studies occurring in elementary schools than secondary schools. Considering classroom management studies in secondary education contexts is limited (Freeman et al., 2018), this is not
surprising. Only two studies represented special educators (Bethune & Wood, 2013; Hopman et al., 2018) whereas 21 studies represented general educators. The focus of the interventions, praise/reinforcement statements, correctives/reprimands, and intervention fidelity, certainly apply to general and special education teachers alike, however, classroom management is often considered a universal level support. Perhaps that is why so few special educators were included in the reviewed studies.

Alignment of Interventions to Core Features

Results from this review indicate that interventions incorporating coaching also included active learning with opportunities for feedback and reflection for the participants. Many of the studies also included models of effective practice and occurred over a sustained duration of time longer than a month. Very few studies connected the intervention to academic content or encouraged collaboration among school-based colleagues. Importantly, 87.2% of the studies using a multi-component intervention package including coaching effectively changed at least one teacher behavior related to EBCM strategies. Furthermore, no multi-component intervention packages integrated all seven of the core features of effective teacher professional development. However, all intervention packages contained at least four and maximum of six core features. Therefore, it is evident that while the seven core features are ideal, a combination of many of them can serve as effective components to promote improved teacher use of EBCM strategies.

Implications for Practice

Implementation of EBCM strategies is vital to developing positive, predictable, effective classroom environments. Supporting teachers to use these strategies with enough fidelity to achieve positive student outcomes is a challenge. Multi-component intervention packages have demonstrated success with effectively changing teacher behavior and improving implementation.
When we braid intervention packages with what has been identified as the core features of effective teacher professional development, we have the potential to maximize the positive impacts.

This review highlights that many of the intervention packages used since 2008 included 4-6 out of 7 of the core features. To enhance implementation and positively impact future intervention studies, it may be helpful to seek ways to connect implementation of EBCM practices to academic content. For example, when teachers are provided new curricula, a tip sheet of possible behavior specific praise statements may be given as well. Another option is to encourage teachers to embed prompts or precorrections into lesson planning documents. Furthermore, when developing future intervention packages, intentionally adding components that promote collaboration among school-based colleagues would likely be beneficial as a mechanism to support durable changes of teacher behavior. This might be demonstrated by peers observing one another and providing performance feedback, using professional learning communities to reflect on self-management data, or conducting monthly meetings to brainstorm solutions to barriers of implementation fidelity.

**Limitations of Literature Review**

Several limitations for this systematic review of the literature exist. First, while I did search three electronic databases well-regarded for educational research, there are additional electronic databases that may have uncovered further studies. Secondly, I may have missed some studies during my ancestral search through reviewed studies reference lists due to a lack of clarity within article title. Also, I used broad search terms (e.g., classroom management) rather than individual EBCM practices (e.g., behavior specific praise). This may have resulted in missed studies that would have met inclusion criteria. I limited my review to K-12 schools.
Many intervention studies exist to promote use of EBCM practices with preschool and preservice teachers that are also worthy of review in the future.

**Current Study**

Aside from being content-focused, the multi-component intervention package for this study was designed to incorporate the identified core features of effective professional development (Darling-Hammond et al., 2017) while also utilizing behavioral theory to develop habits of effective practice (Simonsen et al., 2020) so novice teachers newly acquired skills can be maintained and generalized. The next chapter will explain the intervention package and the methods used to determine if the intervention was effective for two dyads of novice teachers.
CHAPTER THREE

METHODS AND PROCEDURES

The purpose of this study was to determine the effect of a multi-component intervention package on novice teachers’ ratios of positive-to-negative student/teacher interactions. I used a single-case multiple baseline across participants design to determine if a functional relationship existed between the intervention and participants’ interaction ratio. Data were collected through video recorded classroom observations. In this chapter, I describe the study’s (a) participants and settings, (b) research design, (c) independent variables, (d) dependent variables, (e) data collection, (f) additional measures, (g) procedures, and (h) data analysis.

Participants and Settings

Recruitment

After receiving Institutional Review Board approval, participant recruitment began. Participants were recruited by the principal researcher throughout July-October 2020. Participant requests were sent out nationally to over 200 contacts in education representing teachers, administrators, higher education faculty and educational organizations such as the Council for Exceptional Children, state and regional networks for Positive Behavior Intervention and Supports, American Association of Colleges for Teacher Education and more. Additionally, requests were posted and shared broadly on social media (Appendix A). By the end of September, four participants had agreed to engage in the study. The goal of the study was to have 6-10 participants within 3-5 dyads. Therefore, I sent requests to 5,000 school leaders throughout the east coast. Unfortunately, no further participants were found. Overwhelmingly, the responses received, if any at all, indicated that due to the pandemic, the educational environment was too demanding for teachers, especially new teachers, to take on anything that might pull their
attention away from their students. As a result, the study was adjusted to be a non-concurrent multiple baseline design with hopes of finding two more participants throughout the fall. Recruitment continued without additional participants and the study remained at four participants in two dyads.

**Dyad 1**

**Rosanna.** Rosanna is a second-year teacher. She teaches fourth grade in a suburban K-6 elementary school within the western United States with a student population of 1,047. 19% of students receive free/reduced lunch and 21% are identified as racial/ethnic minorities. The school’s teacher/student ratio is 24:11.

**Reilly.** Reilly is a fourth-year K-5 special education teacher. She teaches in a rural community within the northeastern United States. The preK-6 Title 1 school has a student population of 341 with 60% receiving free/reduced lunch. 9% of students are identified as racial/ethnic minorities. The school’s teacher/student ratio is 11:18.

**Dyad 2**

**Garrett.** Garrett is a fourth-year teacher. He taught a multi-age fourth/fifth grade for three years. He is currently teaching third grade for the first time in a rural community within the northeastern United States. The preK-5 school is identified as a Title 1 school with a student population of 111. 73% of students receive free-reduced lunch. 7% are racial or ethnic minority. The school’s teacher/student ratio is 10:27.

**Ginny.** Ginny is a third-year K-5 special education teacher. She teaches in a rural community within the northeastern United States. The preK-5 school student population is 233 with 24% receiving free/reduced lunch. 4% of students identify as racial/ethnic minorities. The school’s teacher/student ratio is 14:32.
Research Design

This study used a non-concurrent single-case, multiple baseline across participants design (Harvey et al., 2004; Horner et al., 2005; Kazdin, 2011). Single-case design research has a long history of use in educational settings to examine the effects of an intervention upon a targeted behavior (Kazdin, 2011).

Non-concurrent Multiple Baseline Across Participants

Multiple baseline across participants is a single-case design that examines the effect of an intervention by comparing baseline behavioral data (prior to intervention) to behavioral data taken following an intervention (Horner et al., 2005; Kazdin, 2011). Due to the logistics of delayed school starts, which varied across participant settings, coupled with participant recruitment challenges, a non-concurrent multiple baseline design was chosen (Harvey et al., 2004). This allowed flexible start dates for each dyad with the potential for a third dyad to be added if participants became available. Unfortunately, this did not occur. Baseline length, minimum of three data points, was randomly assigned to each dyad (Kratochwill et al., 2010) resulting in staggered application of the intervention across the two dyads. This design choice allowed each participant within a dyad equal time to stabilize their ratios of positive-to-negative student/teacher interactions and was more aligned to what might occur in a natural application of this intervention.

Description of Independent Variable (IV)

Based upon the positive results of previous studies used to improve teacher’s use of EBCM practices (e.g., Cavanaugh, 2013; Cook et al., 2017; Kennedy et al., 2016; Reinke et al., 2008; Simonsen et al., 2017) a multi-component intervention package, fully explained in Appendix B, was provided to the participants. This multi-component intervention package
incorporated the six out of seven of the core features of effective teacher professional development (Darling-Hammond et al., 2017).

1. **Is content focused.** This component was only indirectly included within the intervention package. As part of the active learning and instruction, one strategy suggested to prompt participants to use praise statements was to think ahead about praise statements they could provide to their students related to the academic content. Since there was no explicit instruction on how to do this, I am not counting this core feature as being incorporated into the intervention package.

2. **Uses active learning.** Participants were continuously engaged in active learning meant to bolster their understanding of EBCM strategies and increase awareness of positive-to-negative interaction ratios between teachers and students. First, they received explicit instruction via a virtual meeting with the researcher and their peer coach. During this training they were given multiple free, accessible resources to read and explore independently. Details and links to the resources can be found within treatment section of the Multi-component Intervention Package Protocol (Appendices B-H). Additionally, each participant strengthened their learning by watching their peer’s video recordings and providing performance feedback weekly with a gradual shift to bi-weekly.

3. **Uses models of effective practice.** As part of the explicit instruction, participants were provided numerous models of effective practice through reading of content and videos. As they began watching one another’s videos, their peer also modeled the practices they were trying to implement effectively.

4. **Supports collaboration with colleagues.** Each dyad was established to serve as a peer coach to one another. Participants were encouraged to communicate with one another
beyond providing performance feedback data. Examples provided to the dyads included action planning, troubleshooting, and celebrating successes.

5. **Provides coaching and expert support.** Dyads of peer coaches were set up to make this intervention feasible and to ensure that schools are not reliant upon outside experts to conduct this professional development. At first, peer coaches reviewed their peer’s video weekly, tallied general praise, specific praise, non-specific corrective, and specific corrective statements, and calculated the positive-to-negative interaction ratio. After 10-12 weeks, this practice became bi-weekly for 4-6 weeks.

6. **Offers feedback and reflection.** Participants received the number of general praise, specific praise, non-specific corrective, and specific corrective statements counted by their peer within a 15-minute video of the participant teaching. That data was calculated into a positive-to-negative interaction ratio and all the data was placed into a pre-formatted spreadsheet that created a cumulative graph of performance feedback. After receiving performance feedback weekly for 10-12 weeks, it was distributed bi-weekly for 6-8 weeks.

7. **Is of sustained duration.** Participants engaged in this intervention for 16-20 weeks. This length of time was intentionally chosen because the extended length of time supports sustainability of new habits (Duhigg, 2012).

**Description of Targeted Behavior/Dependent Variable (DV)**

The dependent variable of this study is the ratio of positive-to-negative teacher/student interactions. This ratio was determined by dividing the total of positive interactions (defined as general and specific praise statements) by the total of negative interactions (general corrective
statements and specific corrective statements) and expressed as a correlation. Figure 3.1 provides an example. Operational definitions for each of these behaviors can be found in Appendix I.

Figure 3.1

*Using Observational Data to Calculate Positive-to-Negative Interaction Ratio*

<table>
<thead>
<tr>
<th>General Praise Statements:</th>
<th>3</th>
<th>Specific Praise Statements:</th>
<th>2</th>
<th>Specific Error Corrections:</th>
<th>3</th>
<th>Non-Specific Corrections:</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Positive Interactions:</td>
<td>5</td>
<td>Total Corrective Interactions:</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ratio of Positive to Corrective Interactions: 1:1

**Measures**

**Pre-Study Survey.** Each participant completed a pre-study survey to gather information about their previous experiences and current perceived classroom management practices (Appendix J).

**Observation tool.** Participants uploaded their videos to the GoReact (www.goreact.com) video platform account. This online platform served as an app they could access through a smartphone or laptop which deposited their videos into a course folder. Their peer coach and study data collectors had access to this course folder. Seven research team members collected frequency data on teacher behavior (general praise, specific praise, precorrection/prompt, specific error correction, general correction) by tagging the videos at the time each behavior was witnessed during the 15-minute self-recorded participant videos taken during direct instruction blocks. Each behavior as well as the positive-to-negative ratio was totaled and added to a spreadsheet for each participant.

**Observer training.** All research team members collecting data were trained to ensure reliability prior to coding the participant videos. Training, provided by myself, consisted of (a) providing explicit instruction in teacher behaviors being coded within the study (general praise,
specific praise, non-specific corrective, and specific corrective statements), (b) watching videos of teachers providing direct instruction with guided practice in coding, and (c) independent practice opportunities to code videos with performance feedback. Training continued until data collectors reached ≥85% interobserver agreement (IOA) with me for three consecutive videos.

**Reliability.** IOA was calculated through the mean count-per-interval method (Cooper et al., 2020). Fifteen-minute observation sessions were broken down into 1-minute intervals so IOA could be determined within each interval (the smaller count was divided by the larger count and multiplied by 100%). Then, IOA was averaged across intervals to determine the IOA for the observation. Interobserver agreement was monitored by me throughout the study. I blindly coded one video of each data collector bi-weekly. If agreement fell below 85%, reteaching of data collector occurred and I blindly coded their one of their videos the following week. IOA was completed for a minimum of 25% of observations across phases.

**Implementation fidelity checklist.** Intervention treatment fidelity data was collected for each dyads intervention treatment by using a fidelity checklist based on the multi-component intervention procedures. It was completed and signed by the participants and observer upon completion of each intervention session. Additionally, the sessions were recorded and later observed by a research team member who then completed the fidelity checklist.

**Novice teacher understanding of positive vs. negative teacher/student interactions.** After they received explicit instruction, each participant was given a post-test to determine their ability to differentiate between positive vs. negative teacher/student interactions and assess their learning (Appendix E).

**Measures of social validity.** In keeping with the value-orientation of positive behavior support, a vital component of my study was to determine if the participants considered the
intervention valuable, effective and feasible. As clearly recognized by Carr et al., (2002), “Science tells us how we can change things, but values tell us what is worth changing” (p. 4). Therefore, the social validity of the intervention was measured with a post-intervention survey. Measuring social validity assessed the usability, acceptability, and feasibility of the intervention, a significant goal of the study. The Teacher Intervention Survey (Appendix K) was adapted for this study based on the Teacher Preparation Intervention Questionnaire (VanLone & Freeman, 2018) and the Intervention Rating Profile-15 (IRP-15; Witt & Elliott, 1985). Each participant was asked to complete this survey upon completion of the study.

**Participant Interviews.** Semi-structured participant interviews were added to this study to gather further insight into how the COVID-19 intervention may have impacted participant experiences throughout the study, gain further understanding about their perceptions of social validity, and assess the feasibility of the intervention. Questions were asked (Appendix L) during a virtual recorded meeting and transcripts of the meeting were acquired through the video conference platform.

**Procedures**

**Data Collection.** Prior to collecting any data, IRB approval was acquired. Once potential participants were identified, I met virtually with each individual to review the informed consent (Appendix M) including the detailed procedures of the study, what they would be asked to do, and the study’s duration. Next, participants were provided with a document to share with their school administrator to gather site permission (Appendix N). Participants were also asked to distribute the Parental Notification Form to student families (Appendix O). Each participant had some families return the form indicating their child could not be video recorded. All possible measures were taken to ensure those students were not recorded. All required consents were
given and site permissions were received prior to any video recording beginning. Participants were provided with access to the GoReact secured video recording and storage platform. Through the course of this study, videos were uploaded to this platform after each observation. Only data collectors, the researcher, individual participants and their peer coach had access to the videos.

**Baseline Phase (A):** The first phase of this study involved the collection of baseline data on participants’ use of EBCM practices specifically general praise statements, specific praise statements, specific error corrections, and general corrections to gather a positive-to-negative teacher/student interaction ratio. Participants were asked to record themselves daily during the same instructional block. Recordings were then coded by trained data collectors.

**Treatment Package:** The multi-component intervention package (Appendix B) was applied to dyads of novice teachers in a staggered manner based upon pre-determined randomized phase start-points (Kratochwill et al., 2010). Since dyad pairs needed to receive the treatment package together and a stable trend of baseline data for each of them was unlikely to occur at the same time, start-points were determined prior to gathering baseline data. Baseline lengths were determined based on a comparison of previous multiple baseline design studies measuring teacher use of EBCM practices. Dyad 1 received the one-hour long, single session treatment package after fourteen sessions of baseline data collection. Dyad 2 received it after eight baseline sessions (Rosanna) and ten baseline sessions (Reilly). Reilly had two extra data points due to technology issues with Rosanna’s recording and a shortened school week. A fidelity checklist of the intervention instruction was completed by participants and observer.

**Intervention Phase (B):** Following delivery of the treatment package, participants were asked to continue recording themselves daily during the same instructional block. I sent weekly
emails prompting them to continue to record each day. The emails did not include prompting to use EBCM practices. Recordings were then coded by trained data collectors using the same procedures as in the baseline phase. During this phase, participants also engaged in weekly peer observations where the peer viewed one recording weekly and completed the Peer Direct Observation Tool (Appendix H). Peers provided one another with performance feedback including the frequency data found within the Peer Observation Tool (Appendix H) and a graphed representation of the data (Appendix H). This information was emailed to the participant by the peer. Because habit formation and durable behavior change requires consistent practice over time (Lally et al., 2010) and sustained duration is a core feature of effective teacher professional development (Darling-Hammond et al., 2017), Dyad 1 continued this phase for ten weeks. Dyad 2 continued this phase for nine weeks. Across participants and dyads, the positive-to-negative student/teacher interaction ratio remained consistently variable. Dyad 2 ended this phase not because they hit the maximum pre-determined duration of this phase, but rather because the frequency of self-recording was diminishing due to scheduling conflicts, technical issues, quarantining, weather events and participants forgetting to record.

**Faded Support Intervention Phase (B1):** In this phase of the study, participants continued to video self-record, I sent weekly email prompts, and observers coded the videos as they had throughout the study. However, participants only observed one another and provided performance feedback bi-weekly. Both dyads completed this for a total of six weeks (Lally et al., 2010).

**Follow-up Phase.** To determine if the effects of this intervention maintain over time, follow-up probes were conducted weekly for approximately one month. During that time, participants were asked to record themselves for 15-minutes once per week.
Data Analysis Plan

**Visual Analysis.** This study was conducted in four distinct phases - baseline, intervention, faded support intervention and follow-up. The treatment package was delivered between baseline and intervention phases. Performance data was analyzed both within and across the phases. Data were graphed across dyads and participants. First, the behavioral changes within each participant were examined by looking for the variability, level, and trend of data points within each phase (Kazdin, 2011). Next, changes in behavior between phases for each participant were examined. Then, data across all participants and within each dyad were examined.

To compare performance of a behavior across phases, the percentage of non-overlapping data (PND) to determine the impact of the intervention package on a participant’s positive-to-negative student/teacher interaction ratio were examined. The percent of non-overlapping points was calculated by counting the number of data points in the intervention phase that were greater than the highest level in the baseline phase, divided by the total number of data points and multiplying by 100%. Interventions are considered effective when the PND points are at least 70% (Parker et al., 2011). Effect size of the intervention was also measured through Tau-U. Tau-U was chosen as a measure because it adjusts for trend, is effective with small data sets, considers non-overlap when determining treatment effects, and uses all data within the data set regardless of outliers (Parker et al., 2011). Tau-U effect sizes range from 0 to 1. A moderate effect ranges from 0.20 to 0.60, anything smaller than 0.20 represents a small change, and results of 0.60 and higher are considered large changes (Vannest & Ninci, 2015). Means for each participant within each phase were also analyzed and compared.

**Surveys and Interview Data.** Data collected through the pre- and post-study surveys and interviews were analyzed for common trends and individual perceptions to provide insight of
participant perspectives of social validity and feasibility of the intervention. Additionally, participant’s checks for understanding were reviewed through descriptive statistics to determine if the participants’ gained new learning from participating in the treatment package. Intervention fidelity checklists were also reviewed through descriptive statistics.
CHAPTER FOUR

RESULTS

In this chapter, I will present the results of this study. I will begin by explaining study participation. Next, I will report descriptive statistics, visual analysis of the data, and the effect sizes that the multi-component intervention had upon the participants’ positive-to-negative teacher/student interaction ratio. This will be followed by results of implementation fidelity and social validity measures.

Research Questions

The research questions of this study strived to determine if the multi-component intervention described previously impacted the positive-to-negative teacher/student interaction ratio and if a fading of support supported maintenance of the newly acquired skill. After participants recorded and shared their videos with the researcher, data collectors coded the videos for general praise, specific praise, non-specific corrections, and specific corrections. That data was calculated to determine the positive-to-negative interaction ratio. Figure 4.1 shows the graphed representation of the data including trendlines.

Study Context

Four participants agreed to participate in this study beginning in the fall of 2020. Of important note, this study occurred throughout the academic year 2020-2021. Schools throughout the world were significantly impacted by the COVID-19 global pandemic. Instructional modality (remote, hybrid, and in-person) was variable. If students were in the classroom, teachers and students were required to adhere to strict health and safety protocols. Periods of quarantine or whole school closures were not uncommon.
**Study Participation**

The study began in October 2020. This allowed enough time for the participants \((n=4)\) to develop new school year classroom communities, routines, and schedules prior to starting the study. Once participants reviewed participant consent forms, received site permission from their school administrator, and informed families video-recording would be occurring in the classroom, participants were provided access to the Go React platform. Participants were asked to record daily. However, recognizing the complexities of this school year as well as the typical variability of elementary classrooms, the study was designed for a minimum of three recordings per week. Table 4.1 shows participant adherence to the video recording request. Rosanna and Reilly, in Dyad 1, Rosanna met criteria 67% and Reilly met criteria 56% of the 18-week study (Rosanna, \(M = 2.80\), Range 1.00-4.00; Reilly, \(M =2.47\); Range 0.00-5.00). Garrett and Ginny, in Dyad 2, met the criteria of at least three recordings each week 94% of the time over the 20-week study (Garrett, \(M = 3.53\), Range 2.00-4.00; Ginny, \(M =3.71\), Range 2.00-5.00). Some challenges identified with video recording daily included technical difficulties, unplanned school closings due to COVID-19 cases or weather events, unexpected schedule changes, teacher and student absences, school vacations, quarantines, and participants forgetting to record.

Table 4.1

*Participant Adherence to Video Recording Procedure*

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Participant</th>
<th>Number of Weeks</th>
<th>Mean</th>
<th>Range</th>
<th>Met Criteria (≥ 3/Week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rosanna</td>
<td>18</td>
<td>2.80</td>
<td>1.00-4.00</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Reilly</td>
<td></td>
<td>2.47</td>
<td>0.00-5.00</td>
<td>56%</td>
</tr>
<tr>
<td>2</td>
<td>Garrett</td>
<td>20</td>
<td>3.53</td>
<td>2.00-4.00</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>Ginny</td>
<td></td>
<td>3.71</td>
<td>2.00-5.00</td>
<td>94%</td>
</tr>
</tbody>
</table>
Phase Duration

Pre-determined, randomized baseline phase durations were staggered between dyads to establish as much experimental control as possible within the fluctuating and challenging school schedules and contexts. The pre-determined number of baseline data points for Dyad 1 was 8. The date for the treatment to be delivered was set to occur after the eighth day of baseline. Variability in school schedules and technical difficulties, resulted in rescheduling the date so Rosanna could reach 8 data points. However, because Reilly was able to record more consistently, she had two more baseline data points than Rosanna. Both Garrett and Ginny in Dyad 2 had 14 baseline data points. The pre-determined baseline length was 11, however, an unexpected and sudden change in scheduling resulted in needing to reschedule the intervention treatment delivery date. Therefore, the decision was made to keep both participants in baseline until the treatment package was delivered.

While every effort was made to remain consistent across study phases, the natural and applied setting of this study resulted in some variability of phase duration. The initial intervention phase lasted 10 weeks for Dyad 1 and 11 weeks for Dyad 2. The actual number of data points for each participant within each phase varied (Range = 29.00-36.00). When participants agreed to participate in the study, they were provided maximum phase durations. The maximum initial intervention phase was 12 weeks. The decision was made to shorten the length of this phase for Dyad 1 by two weeks because while individual data points were variable, a stable trendline was demonstrated. Furthermore, participant adherence to daily recording and completing peer performance feedback was beginning to diminish. Concern about participant attrition and a desire to have a faded support phase also played a role in the decision to move Dyad 1 participants to the faded support phase prior to the 12-week maximum duration. Dyad 2’s
initial intervention phase lasted 11 weeks rather than 12 weeks because there was a natural, logical break in the school calendar. There was also concern about time constraints within the academic year. Additionally, while Garrett’s data demonstrated an ascending trendline, Ginny demonstrated a stable trendline, and individual data points for each of them were highly variable. It was also important that the dyads had similar phase durations. The Faded Support Intervention phase lasted 6 weeks for each dyad with variable number of data points across participants (Range = 7.00-23.00). The variability in number of data points was a result of many factors including school schedules, technical difficulties, participants forgetting to record, unexpected school closures. Following the faded support phase, all participants were asked to record themselves once each week for four weeks to gather maintenance probes.

**Visual Analysis of Positive-to-negative Teacher/student Interaction Ratios**

Visual analysis of data graphed across participants was used to determine the effectiveness of this intervention (Figure 4.1). Visual analysis considered stability and variability of performance, number of data points across phases, means in and within phases and the overlap of data across phases (Kazdin, 2011). Descriptive statistics are shown in Table 4.2 below. Furthermore, TAU-U (Table 4.3) and PND (Table 4.4) were used to determine effect sizes of the intervention. Within TAU-U, baseline trends “under 0.10 or even 0.20” do not need to be corrected (Vannest & Nincy, 2015, p. 407). Three out of four participants’ baseline trends were greater than 0.10. To be conservative, I corrected for baselines that were above 0.10.

**Dyad 1**

**Rosanna.** Rosanna’s baseline data demonstrated a level ($M = 1.79$, $Mdn = 1.54$) below the target ratio of 5.00 with an increasing trend with some variability of individual data points (Range = 0.50-3.25). Data within the intervention phase revealed a higher level than the baseline
phase \((M = 3.53, Mdn = 3.36)\) with an unchanged trend. Variability within her individual data points increased (Range = 0.37-8.80). Tau-U contrast between corrected baseline and intervention phases was 0.43 \((p = .05)\) indicating a moderate effect (Vannest & Ninci, 2015) with PND = 27.59% indicating no effect (Parker et al., 2011). During the faded support intervention phase, the level of Rosanna’s positive-to-negative interaction level was higher than the initial intervention phase \((M = 4.89; Mdn = 1.67)\) with an increasing trend. Visual analysis of individual data points indicated considerable variability (Range = 0.76-19.00). Tau-U contrast between baseline and faded support phases was 0.10 \((p = 0.70)\) demonstrating a small change (Vannest & Ninci, 2015) with PND = 27.27% indicating no effect (Parker et al., 2011). Tau-U contrast between the intervention and faded support phases was -0.28 \((p = 0.18)\). Contrast between baseline and combined intervention phases (initial intervention and faded support) indicates a moderate effect according to TAU-U \((0.40, p = 0.06)\).

**Reilly.** During baseline, Reilly’s baseline level of positive-to-negative teacher/student interactions \((M = 2.50, Mdn = 2.32)\) was below the target ratio of 5:1 with a decreasing trend and some variability across individual data points (Range = 0.91-5.00). She demonstrated a lower level in the intervention phase \((M = 2.03, Mdn = 1.44)\) compared to baseline with no change in trend. Visual analysis indicates a moderate range of variability in individual data points (Range = 0.22-8.00). Tau-U contrast between corrected baseline and intervention phases was -0.09 \((p = 0.69)\) indicating a very low effect (Vannest & Ninci, 2015) with PND = 4.17% indicating no effect (Parker et al., 2011). During the faded support intervention phase, Reilly’s level was lower than the initial intervention phase \((M = 1.69; Mdn = 1.44)\) with an increasing trend. Visual analysis of individual data points indicated considerable variability (Range = 0.82-4.00). Tau-U contrast between baseline and faded support phases was -0.15 \((p = 0.60)\) demonstrating a small
change (Vannest & Ninci, 2015). Tau-U contrast between the intervention and faded support phases was 0.13 ($p = 0.60$) with PND = 0% indicating no effect (Parker et al., 2011). Contrast between baseline and combined intervention phases (initial intervention and faded support) indicated a low effect according to TAU-U (-0.13, $p = 0.55$).

**Dyad 2**

**Garrett.** Garrett’s baseline exhibited a moderate level of positive-to-negative teacher/student interactions ($M = 3.20$, $Mdn = 2.74$) with an increasing trend. His individual data points showed significant variability (Range = 0.50-16.00). His intervention phase displays a higher level than the baseline phase ($M = 5.50$, $Mdn = 2.63$) with an increasing trend. His level was above the target ratio of 5.0. He also had high levels of variability (Range = 0.58-26.00). Tau-U contrast between corrected baseline and intervention phases was 0.14 ($p = 0.46$) indicating a low effect (Vannest & Ninci, 2015) with PND = 2.86% indicating no effect (Parker et al., 2011). During the faded support intervention phase, Garrett revealed a lower level of positive-to-negative interactions compared to the initial intervention phase ($M = 4.04$; $Mdn = 4.94$) with a decreasing trend. Visual analysis once again indicated considerable variability (Range = 0.50-24.00). Tau-U contrast between baseline and faded support phases was 0.04 ($p = 0.83$) demonstrating a very small change (Vannest & Ninci, 2015). Tau-U contrast between the intervention and faded support phases was -0.13 ($p = 0.40$) with PND = 4.35% indicating no effect (Parker et al., 2011). Contrast between baseline and combined intervention phases (initial intervention and faded support) indicates a low effect according to TAU-U (0.14, $p = 0.43$).

**Ginny.** Ginny’s baseline data presented a low level of positive-to-negative teacher/student interactions ($M = 1.16$, $Mdn = 0.78$) with a slightly increasing trend. She also had some variability (Range = 0.14-3.40). Her intervention phase showed a higher level than the
baseline phase \((M = 4.49, Mdn = 2.17)\) with a relatively unchanged trend. This level approached the target ratio of 5.0. Visual analysis indicates high variability (Range = 0.40-15.00). Tau-U contrast between baseline and intervention phases was 0.53 \((p = 0.00)\) indicating a moderate effect (Vannest & Ninci, 2015) with PND = 33.33% indicating no effect (Parker et al., 2011). During the faded support intervention phase, Ginny revealed a lower level of positive-to-negative interactions compared to the initial intervention phase \((M = 3.18; Mdn = 1.21)\) with a decreasing trend. Visual analysis indicated considerable variability (Range = 0.24-28.00). Tau-U contrast between baseline and faded support phases was 0.30 \((p = 0.14)\) demonstrating a moderate change (Vannest & Ninci, 2015) with PND = 13.63% indicating no effect (Parker et al., 2011). Tau-U contrast between the intervention and faded support phases was -0.24 \((p = 0.13)\). Contrast between baseline and combined intervention phases (initial intervention and faded support) indicates a moderate effect according to TAU-U \((0.44, p = 0.01)\).
Figure 4.1

Positive-to-Negative Teacher/Student Interaction Ratios Across Study Phases

Positive-to-negative teacher/student interaction rate

Sessions

Sessions
Table 4.2

Positive-to-Negative Interaction Ratio Descriptive Statistics Across Participants

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Participant</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Faded Support</th>
<th>Intervention + Faded Support</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rosanna</td>
<td>Number of Sessions</td>
<td>8</td>
<td>29</td>
<td>11</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>1.79</td>
<td>3.53</td>
<td>4.89</td>
<td>3.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median</td>
<td>1.54</td>
<td>3.36</td>
<td>1.67</td>
<td>3.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range</td>
<td>0.50-3.25</td>
<td>0.37-8.00</td>
<td>0.76-19.00</td>
<td>0.37-15.00</td>
</tr>
<tr>
<td>Reilly</td>
<td>Number of Sessions</td>
<td>10</td>
<td>24</td>
<td>7</td>
<td>31</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>2.50</td>
<td>2.03</td>
<td>1.69</td>
<td>1.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median</td>
<td>2.32</td>
<td>1.44</td>
<td>1.44</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range</td>
<td>0.91-5.00</td>
<td>0.22-8.00</td>
<td>0.82-4.00</td>
<td>0.64-4.75</td>
</tr>
<tr>
<td>2</td>
<td>Garrett</td>
<td>Number of Sessions</td>
<td>14</td>
<td>35</td>
<td>23</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>3.20</td>
<td>5.50</td>
<td>4.04</td>
<td>4.94</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median</td>
<td>2.74</td>
<td>2.63</td>
<td>2.57</td>
<td>2.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range</td>
<td>0.50-16.00</td>
<td>0.58-26.00</td>
<td>0.50-24.00</td>
<td>0.50-26.00</td>
</tr>
<tr>
<td>Ginny</td>
<td>Number of Sessions</td>
<td>14</td>
<td>36</td>
<td>22</td>
<td>58</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>1.16</td>
<td>4.49</td>
<td>3.18</td>
<td>3.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median</td>
<td>0.78</td>
<td>2.17</td>
<td>1.21</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range</td>
<td>0.14-3.40</td>
<td>0.40-15.00</td>
<td>0.24-28.00</td>
<td>0.67-28.00</td>
</tr>
</tbody>
</table>

Across Participants

To fully understand the impact of the intervention across participants, I examined the average TAU-U effect size for each phase across participants. The contrast between the baseline
and initial intervention phase was 0.26 ($p = 0.01$) indicating a slightly moderate effect. The contrast between baseline and faded support showed a very low effect 0.09 ($p = 0.46$). Similarly, the contrast between intervention and faded support demonstrated a low effect size of -0.14 ($p = 0.14$). When the overall intervention (initial phase plus faded support phase) was contrasted against baseline, a slight moderate effect was identified with TAU-U at 0.22 ($p = 0.02$). Finally, I calculated an omnibus TAU-U to identify an overall intervention effect across participants and phases. Results indicated a low effect of 0.18 ($p = 0.02$).

Table 4.3

**TAU-U Trend and Phase Contrasts**

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Participant</th>
<th>Baseline Trend</th>
<th>Baseline vs Intervention Contrast</th>
<th>Baseline vs Intervention Faded Support Contrast</th>
<th>Intervention vs Faded Support Contrast</th>
<th>Baseline vs Overall Intervention Contrast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tau-U</td>
<td>Tau-U p-value</td>
<td>Tau-U p-value</td>
<td>Tau-U p-value</td>
<td>Tau-U p-value</td>
</tr>
<tr>
<td>1</td>
<td>Rosanna</td>
<td>0.56*</td>
<td>0.43 0.05**</td>
<td>0.10 0.70</td>
<td>-0.28 0.18</td>
<td>0.40 0.06</td>
</tr>
<tr>
<td></td>
<td>Reilly</td>
<td>-0.16*</td>
<td>-0.09 0.69</td>
<td>-0.15 0.60</td>
<td>0.13 0.60</td>
<td>-0.13 0.55</td>
</tr>
<tr>
<td>2</td>
<td>Garrett</td>
<td>0.36*</td>
<td>0.14 0.46</td>
<td>0.04 0.83</td>
<td>-0.13 0.40</td>
<td>0.14 0.43</td>
</tr>
<tr>
<td></td>
<td>Ginny</td>
<td>0.08</td>
<td>0.53 0.00**</td>
<td>0.30 0.14</td>
<td>-0.24 0.13</td>
<td>0.44 0.01**</td>
</tr>
<tr>
<td>Average</td>
<td>N/A</td>
<td>0.26</td>
<td>0.01**</td>
<td>0.09 0.46</td>
<td>-0.14 0.14</td>
<td>0.22 0.02**</td>
</tr>
<tr>
<td>Average Combined Across Participants and Phases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.18 0.02**</td>
</tr>
</tbody>
</table>

*corrected baseline used if baseline trend was over 0.10 (Vannest & Ninci, 2015)

** $p < .05$
Table 4.4

Percent of Non-overlapping Data (PND)

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Participant</th>
<th>Highest Baseline Point</th>
<th>Intervention</th>
<th>Faded Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rosanna</td>
<td>4.00</td>
<td>27.59%</td>
<td>27.27%</td>
</tr>
<tr>
<td></td>
<td>Reilly</td>
<td>5.0</td>
<td>4.17%</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>Garrett</td>
<td>16</td>
<td>2.86%</td>
<td>4.35%</td>
</tr>
<tr>
<td></td>
<td>Ginny</td>
<td>3.4</td>
<td>33.33%</td>
<td>13.63%</td>
</tr>
</tbody>
</table>

Implementation Fidelity

Intervention Fidelity

After explicit instruction was provided to participants as part of the multi-component intervention package, participants completed an intervention fidelity checklist based on the intervention procedures. All four participants indicated that 100% of the intervention was provided as intended. Additionally, a data collector watched a video recording of the explicit instruction and also indicated that 100% of the intervention was provided as intended. This occurred for both sessions of explicit instruction (one for Dyad 1 and a second one for Dyad 2).

Novice Teacher Understanding of Positive vs. Negative Teacher/Student Interactions

After explicit instruction was provided, participants were asked to read examples of teacher responses to student behavior and identify the type of statement (general praise, specific praise, non-specific corrective, and specific corrective). All four participants achieved 100% accuracy on this assessment.

Participant Fidelity to Peer Coaching

Dyad 1. The consistency of providing performance feedback to their peer partner was a challenge for Dyad 1. Rosanna received performance feedback from Reilly 80.00% of the
intervention weeks and 33.33% of the faded support weeks. Reilly received performance feedback from Rosanna 80% of the intervention weeks and 33.33% of the faded support weeks. Both participants required multiple prompts to complete the task and the performance feedback email to their peers were rarely sent within the agreed upon date range.

**Dyad 2.** Dyad 2 had stronger fidelity to the peer performance feedback routine. Both Garrett and Ginny provided performance feedback to their peer 100% of the intervention weeks and 100% of the faded support weeks. Throughout the duration of the study, they needed few prompts to complete the task and consistently sent the performance feedback to their peers within the agreed upon date range.

**Interobserver Agreement**

Seven data collectors were trained in the video coding procedures. Table 4.5 shows interobserver agreement results. Across the study, IOA was gathered on 28.11% of videos with 88.78% IOA (Range = 70.69-100%). Within phases and across participants, IOA was calculated for 39.10% of baseline (phase A) observations. Agreement across baseline (phase A) averaged 88.20% (Range = 70.69-96.94%). IOA was calculated for 25.80% of initial intervention (phase B) observation with agreement averaging 89.27% (Range = 76.64-100%). IOA was calculated for 25.40% of faded support intervention (phase B1) observations averaging 88.80% (Range = 71.11-99.17%). IOA was calculated for 25.00% of the follow-up observations averaging 88.78% (Range = 85.14-90.83%).
### Table 4.5

*Interobserver Agreement of Observation Video Coding*

<table>
<thead>
<tr>
<th></th>
<th>Number of Observations (n)</th>
<th>% of n</th>
<th>Mean IOA</th>
<th>Range IOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>18</td>
<td>39.10%</td>
<td>88.20%</td>
<td>70.69-96.94%</td>
</tr>
<tr>
<td>Intervention</td>
<td>32</td>
<td>25.80%</td>
<td>89.27%</td>
<td>76.64-100%</td>
</tr>
<tr>
<td>Faded Support</td>
<td>16</td>
<td>25.40%</td>
<td>88.80%</td>
<td>71.11-99.17%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4</td>
<td>25%</td>
<td>88.09%</td>
<td>85.14-90.83%</td>
</tr>
<tr>
<td>Across phases</td>
<td>70</td>
<td>28.11%</td>
<td>88.78%</td>
<td>70.69-100%</td>
</tr>
</tbody>
</table>

### Social Validity

A key purpose of this study was to determine if a low-cost, low-intensity multi-component intervention implemented through a peer coaching model would improve the positive-to-negative interaction ratios between teachers and students. The social validity of the novice teachers as implementers is also important to examine. This was done by comparing participant responses to survey questions asked before and after the study, a post-study social validity survey, and a post-study interview with each participant. All participants completed each of these measures.

**Pre/Post Study Survey**

Prior to the study, participants were asked to provide short answers to five questions through an online survey. These questions focused on their perceived use of EBCM strategies and responses to student behavior (Appendix J). These same five questions were asked again when the faded support phase of the study had ended. I compared pre- and post-study responses for trends and study impact.

When asked “What are some strategies you use in your classroom to help with classroom management?”, three participants responded similarly pre- and post-study. Compared to her pre-
study response, Reilly provided more specific strategies and included use of positive feedback when she responded post-study. Participants were also asked “What classroom management strategies have you found to be most effective?” This question led to two participants showing no real change and two participants, Ginny and Rosanna, responding with similar strategies post-study as they did pre-study however, they added positive feedback to their strategy list after completing the intervention. Participant responses to “What strategies have you found to be ineffective?” remained relatively consistent pre- and post-study.

The responses to “What are some things you feel you need to work on regarding classroom management?” and “How do you handle misbehavior in your classroom?” yielded more significant changes. Prior to the study, three out of four participants responded to these questions by identifying interfering student behavior. Each of these participants switched their perception when responding to the post-study questions to instead focus on their role in responding to student behavior. For example, when asked about what he needed to work on prior to the study beginning Garrett responded, “I need to work on classroom management practices that best minimize talking and chatting in the classroom.” At the end of the study, he responded to the same question by saying, “I need to work on continuing to keep a 5:1 positive ratio during lessons.”

Social Validity Survey

Each participant was asked to answer six questions related to worthiness, feasibility, and effectiveness of the intervention on a likert scale ranging from strongly disagree (1) to strongly agree (5). Descriptive statistics of the results can be seen in Table 4.6.
Table 4.6

*Social Validity Survey Results*

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean</th>
<th>Range</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>This intervention improved my ability to use evidence-based classroom management skills</td>
<td>4.75</td>
<td>4.00-5.00</td>
<td>0.5</td>
</tr>
<tr>
<td>This intervention increased appropriate behavior in my students</td>
<td>4.5</td>
<td>4.00-5.00</td>
<td>0.6</td>
</tr>
<tr>
<td>This intervention decreased inappropriate behavior in my students</td>
<td>4.25</td>
<td>4.00-5.00</td>
<td>0.5</td>
</tr>
<tr>
<td>This intervention was easy to use.</td>
<td>5</td>
<td>5.00-5.00</td>
<td>0</td>
</tr>
<tr>
<td>This intervention took more effort than it was worth.</td>
<td>1</td>
<td>1.00-1.00</td>
<td>0</td>
</tr>
<tr>
<td>This intervention should be recommended to schools to aid in the development of novice teachers’ classroom management skills.</td>
<td>5</td>
<td>5.00-5.00</td>
<td>0</td>
</tr>
</tbody>
</table>

1-Strongly Disagree 5- Strongly Agree

*Social Validity Interviews*

Once participants entered the follow-up phase of the study, they were each asked to meet with me for a 30-minute virtual interview. Each participant agreed and expressed eagerness to share their perspective. Following the interviews, interview transcripts were examined for common themes related to reinforcement for engaging in the target behavior (increased positive-to-negative teacher/student interaction ratio), perception of the peer-coaching protocol, implementation process, and impact of COVID-19 pandemic on participant implementation.

**Reinforcement.** While there were individual variations, regarding what was considered reinforcing for each participant, four broad themes emerged. Overwhelmingly, participants noticed an improvement in their teaching practices and increased awareness of the practices
being used. Second, data-driven performance feedback was also identified as a reinforcer by each participant. One participant identified receiving praise from another teacher was affirming and she looked forward to it each week. Third, all four participants perceived positive impacts on their students as a result of their participation in this intervention. In addition to stronger classroom community, perceptions of positive impacts included students asking more questions, participating more frequently, being more likely to ask for help, disrupting class less, and sharing feelings of happiness and excitement about coming to school. Finally, when specifically asked about why they continued throughout the long duration of this study during an exceptionally challenging academic year, participants indicated that they were motivated to continue because they were honoring a commitment and felt valued to be a part of helping future novice teachers.

Peer-coaching Protocol. The intervention for this study relied upon peers to provide performance-feedback to one another through video recording and email. Overall, participants indicated positive experiences with this protocol. Peers found watching their peer and computing their peer’s positive-to-negative teacher/student interaction ratio benefited themselves because their peer served as a model, provided examples of new ways to praise students, validated the challenge with reaching the target of 5:1 (one participant said, “I was glad to know I’m not the only one finding this hard!”), and offered insight into the impact of teacher/student interactions from an outsider perspective. There were also some barriers or challenges related to the peer-coach process. One participant expressed frustration because her peer-coach was not reliable and did not provide accurate data. Two participants indicated they would have preferred to be within closer proximity to one another, ideally within the same school, so they could have developed stronger, more supportive relationships with their peer-coach. Another concern mentioned by
two participants was the difference in general vs. special education classrooms made it challenging to fully utilize their peer as a model for their own practice.

**Implementation Process.** Analyzing the interview transcripts for perceptions of the implementation process for the intervention focused on feasibility, supports to promote fidelity, barriers to fidelity, value of resources, and individual modifications to the process. Participants consistently stated that they found the time allocation for this intervention manageable, the protocols easy-to-follow and complete, and over time, even the daily recording required for the study became routine and habitual. Two out of four believed that the daily recording made it a more realistic view of their behavior as well as their students’ behavior. When they were told the actual intervention would require recording only once a week compared to daily for the research study, the consensus was that it seemed completely manageable. Participants shared that the daily recordings and weekly emails from the researchers served as prompts to follow study protocols leading to enhanced fidelity. Technology challenges, technical glitches, and student parents denying permission for students to be recorded were the primary barriers to recording and implementation. The specific free and readily available resources shared as a part of the explicit instruction were generally forgotten when asked “What shared resources did you find most helpful? Why? How did you use them?” during the post-study interview six months later. However, participants mentioned video examples and practical ways to track their positive-to-negative teacher/student interaction ratio as helpful. One participant, Ginny, mentioned trying to use the Be+ app (pbis.org) but finding it hard to carry her phone around with her. She also struggled with using counters of any kind to self-monitor herself because her students found it distracting.
Three out of four participants acknowledged they went beyond the scope of the intervention to watch some of their own videos and code them. Garrett stated “I decided to watch my own videos to check on technical aspects, found it helpful so I did it more frequently.” He also claimed that he found himself examining the data for patterns and trends such as days of the week and time of day. Ginny stated that she often went back and watched her videos after hard days to see what she could do differently. Rosanna linked her participation in this study to her teacher evaluation goal and used the videos and performance feedback as evidence of achieving her goal. Contrary from Ginny, Rosanna watched her videos to determine what went well that she could try to do more often.

**COVID-19 Impact.** Both general education teachers, Rosanna and Garrett, indicated that the COVID-19 pandemic only slightly impacted their ability to adequately participate in this intervention. They both mentioned that their schedules of only four days per week made it more challenging to meet the three day per week minimum of recordings. Reilly and Ginny, both special education teachers with inconsistent schedules, stated that COVID-19 greatly impacted their ability to complete the intervention protocols such as daily recording and providing peer performance feedback. The typical variability of their schedules was exacerbated by the hybrid teaching modality, periodic school closures, and adapted school schedules to accommodate spacing requirements. This made it hard for them to record as consistently as they wanted to do. Reilly also indicated that she struggled to concentrate on her teaching because she was frequently reminding students about space and mask usage, especially in her very small classroom space.

This chapter presented the results of this study, including visual analysis of participants’ positive-to-negative teacher/student interaction ratio, implementation fidelity, and social validity.
data. The next chapter will provide a discussion of the results, implications of the findings, and limitations of the study.
CHAPTER FIVE

DISCUSSION

The purpose of this study was to determine if a peer-coaching multi-component intervention would impact novice teachers’ ratio of positive-to-negative student/teacher interactions and if gradually faded support would promote maintenance of improved ratios. This chapter discusses the findings of the study with respect to the intervention’s impact on each participant, within each dyad, and across all four participants. Fidelity to study procedures will be discussed along with the results of social validity measures. Following the discussion of the intervention’s impact, I will discuss the limitations of the study as well as implications for practice, research and policy gleaned from the findings.

Intervention Impact

Dyad 1

Rosanna. Rosanna’s positive-to-negative teacher/student interaction ratio was highly variable throughout the duration of the intervention. Due to that high variability and her unstable baseline, I examined phase means for possible intervention impacts. Her phase means showed increasing positive-to-negative teacher/student interaction ratios over the duration of the study (Figure 5.1). Further, her faded support mean was remarkably close to the target ratio of 5.0. Her phase trends and overall effect size of the intervention (TAU-U = 0.40, p = 0.06) point to a slow, gradual, low to moderate intervention effect. Her low ratios in maintenance signify that while it took time for her to build fluency and habituation to provide more positive than corrective feedback to students, she was making improvement and may have needed a longer duration of the faded support phase. If time constraints were not a concern, Rosanna may have been more likely to have more significant effects as a result of her participation in this intervention.
Another consideration for Rosanna’s slow but steady improved performance lies within fidelity of implementation. Due to the COVID-19 pandemic, her school conducted full student in-person learning only four out of five days each week. She claimed during her post-study interview that this presented challenges with being able to record as frequently as she would have liked to do. Additionally, she often experienced challenges with uploading her videos to the online platform due to school connectivity issues. This added to the challenges with daily video recording. Rosanna received inconsistent, often delayed performance feedback from her peer coach. After a period of four weeks without receiving performance feedback, she received three weeks of data in one day. When Rosanna reviewed the data, she found it inconsistent with the self-monitoring she had done in absence of receiving performance feedback from her peer coach.

Because the goal of this intervention is for natural implementers to conduct the protocols, when Rosanna contacted me, I encouraged her to email her peer coach herself. In her email, Rosanna asked her peer coach to review the definitions of each target behavior (general praise, specific praise, non-specific corrective, specific corrective statements). Her peer coach re-watched the one of the videos and provided revised data that was closer to Rosanna’s self-monitoring data.

Challenges with fidelity of implementation and adherence to study protocols certainly may have hindered Rosanna’s performance growth.

Based on interviews, Rosanna reported that participation in this study was highly beneficial to her teaching. She claimed having increased positive interactions with her students has become a more habitual within her teaching practices. She was reinforced by the data demonstrating improved ratios of positive-to-negative feedback to students and found herself intentionally striving to reach the target of five positive statements for every corrective statement given. She also enjoyed attending to how different students responded to the positive feedback.
Through her post-study interview she indicated the daily recording was a useful prompt and wondered if she would have similar results if she was only recording once each week. She alleged that the routine or recording contributed to building a habit of practice. Additionally, she wondered whether “real” data could be gathered if a data collector was sitting in the room rather than a video camera. She believes that it is easier to “act natural and forget the camera is on” than it would be to do so if a person was in the room with her and her students. Rosanna’s insight leads to potential implications for future practice and research to be discussed later in this chapter.

Reilly. Reilly’s performance data presented with less variability than her peer coach with consistently descending means across phases (Figure 5.1). She exhibited a descending baseline trend with a stable initial intervention phase trend aligned to her low baseline trend endpoint. This suggests that the initial intervention had no impact on Reilly’s positive-to-negative teacher/student interaction ratio. This is confirmed through comparing phase contrasts (TAU-U = -0.09, p = 0.69). Reilly’s performance in the faded support phase demonstrated an ascending trend that remained well-below the target ratio of 5.0. Across the intervention phases, only one data point (8.00) was higher than her highest baseline data point (5.00). Therefore, her PND was remarkably low (3.23%). Furthermore, her challenge to achieve ratios higher than her highest baseline ratio causes me to consider if her knowledge of the study’s goals, gained during the consent process, contributed to her high baseline ratio. It is not uncommon for behavior to initially increase or improve when attention is drawn to it. Sustaining that newly acquired level of behavior, however, is much more challenging (Cooper et al., 2020). Like her peer coach, Rosanna, Reilly demonstrated a stable baseline trend throughout maintenance. That trend was remarkably lower than the previous faded support phase indicating that the behavior was not
maintained over time. Contrasting Reilly’s baseline to the overall intervention (TAU-U = -0.13, 
p = 0.55) clearly demonstrates that the intervention had no significant effect on improving
Reilly’s positive-to-negative interactions with her students.

Implementation fidelity and adherence to study protocols was challenging for Reilly. Her
frequently changing schedule as a special education resource room teacher, paired with teaching
during a pandemic causing significantly disrupted school routines and schedules, limited her
ability to record daily and develop routines. For example, due to her school’s hybrid cohort
model, there were several days when she had no in-person students. Unfortunately, even the
explicit instruction portion of the multi-component intervention was impacted by unexpected
disruptions. The explicit instruction session was scheduled at a time mutually agreed upon by
both peer coaches and myself. It was conducted as a videoconference. Reilly had anticipated
being home for the session, however, she was held up at school and therefore, attended the first
half of the session from her car while driving her daughter home from school. Not surprisingly,
when she was asked about helpful resources during the post-study interview, she claimed that
she couldn’t remember any specifically. Rather, she “culled what she needed from them and put
them aside”. As explained previously, Reilly often struggled to provide timely performance
feedback to her peer. She frequently cited competing demands, such as adjusting her room to
meet health and safety protocols, meeting with colleagues to discuss challenging student
behavior, and forgetting because she has so many more things to keep track of than normal, as
the reason for not being able to complete the task. She typically received performance feedback
from her peer coach more consistently, however, it was often 2-3 days beyond the requested
date. Reilly’s inconsistent implementation fidelity and adherence to study protocol may have
been a significant factor behind the lack of impact this intervention had on her teacher/student interactions.

During her post-study interview, Reilly stated that participation in this intervention made her more aware of the language she used during her interactions with students. She also realized, based on her performance data, that she “wasn’t as positive as she thought she was.” Even though her data did not signal an intervention effect, Reilly perceived a positive change in student outcomes. Specifically, she indicated that students are engaging in more of the behaviors that she praised such as work completion and staying focused. Reilly believed this intervention to be completely feasible once the habit of recording was established. Perhaps a more consistent schedule would strengthen routines to promote implementation fidelity, which could lead to improved intervention outcomes. This will be considered in the implications of the study section.

Dyad Overview. While Rosanna and Reilly had unique experiences and outcomes as a result of participation, there were some common patterns to consider. Rosanna and Reilly had opposing baseline trends. Rosanna had an ascending trend whereas Reilly’s baseline trend was descending. Both were highly variable and had means well below the target ratio of 5.0. Following baseline, their levels of target behavior were different however, both had relatively stable initial intervention trends followed by ascending trends during the faded support phase. Additionally, both Rosanna and Reilly demonstrated stable maintenance trends well below the high ascending trendline endpoint in the previous phase. Interestingly, they only provided each other with performance feedback one out of three expected times during the faded support phase. Yet, both had ascending trendlines. These findings demonstrate the need for further research to determine if there are underlying factors within the dyad that contribute to performance of the target behavior.
**Dyad 2**

Garrett. Garrett’s baseline showed a rapidly ascending trend. By the time the intervention was delivered, he had one data point that met the 5.0 target ratio and one data point that far exceeded it (16.0). Furthermore, his mean baseline was 3.20. If finding participants for this study had not been a concern, I would have likely removed him as a viable participant for this study. Doing so, however, would have left only one dyad and greatly hampered the ability to move forward. Nonetheless, Garrett continued and demonstrated an ascending trend throughout the initial intervention phase. His mean jumped from 3.20 in baseline to 5.50 during this phase. His TAU-U of 0.14 ($p = 0.46$), however, indicates little effect. After entering the faded support phase, there was a sharp descending trend with several data points returning to at or below his lowest baseline ratio. His mean across intervention phases was 4.94 which is remarkably close to the target of 5.0. His maintenance ratios point to another descending trend. The ascending trend throughout the initial implementation phase followed by descending trends demonstrates the challenge with sustaining new behaviors and points to a need to potentially extend the initial implementation phase.

Throughout the entire duration of the study, Garrett consistently provided recordings while also following study and intervention protocols. He provided performance feedback to his peer coach, Ginny, each week, although, feedback from two weeks were delayed by a day or two. He also received performance feedback from his peer consistently and within the requested time range. His adherence to fidelity of implementation may have contributed to a high level of performance. His drop in performance occurred when the performance feedback was faded back to biweekly. This suggests that the weekly routine of receiving and providing performance feedback contributed to his improved positive-to-negative interaction ratio with students.
When asked about his biggest takeaway from his experience with this interview, Garrett stated, “I realized that having positive interactions are the foundation to everything that happens with students. It’s surprising that something so small can help student learning every day.” He also found intervention implementation to be highly valuable, manageable, easy, and straightforward. The daily recording served as a prompt for him to reflect on his strengths and areas for improvement. He enjoyed examining the data and using it to set goals for himself. Findings associated with Garrett’s data signal that even novice teachers with positive-to-negative teacher/student interaction ratios may benefit from prolonged interventions to strengthen that behavior.

**Ginny.** Ginny began the study with a low and relatively stable baseline. After the intervention was delivered, there was a large improvement in her ratio of positive-to-negative teacher/student interactions. Throughout the initial implementation phase, her data indicated high variability but, her trend was stable and well above her baseline trend. Her initial implementation phase mean of 4.49 approached the target ratio of 5.0, a striking comparison to her baseline mean of 1.16. Her TAU-U contrast between those phases (0.53, \( p = 0.00 \)) indicated a moderate effect. When she moved into the faded support phase, however, there was a steady decline in her performance trend. Across phases, in contrast to baseline, Ginny’s TAU-U of 0.44 (\( p = 0.01 \)) showed there was a moderate effect, however, her PND of 25.48% indicated no effect.

Interestingly, Ginny’s maintenance data shows an ascending trend even after the descending trend during the faded support phase. She is the only participant to have a higher mean in maintenance (2.34) than she did in baseline (1.16). However, it was well below the target ratio of 5.0 positive-to-negative teacher/student interactions. Once again, these findings point to a potential need to extend each phase so learning can be generalized and maintained.
Similar to her peer coach, Ginny consistently adhered to intervention protocols in a timely and reliable manner. She provided performance feedback to her peer regularly and in a timely manner. She sent performance feedback to her peer each week with only two weeks delayed by a day or two. This high level of fidelity likely supported her improved positive-to-negative teacher/student interaction ratios.

Ginny reported during her end-of-study interview that her involvement in this intervention promoted reflective teaching practices for herself. Over time she believed she became more positive and intentional when responding to students. She also found herself attending to student needs and problem-solving rather than “just telling students to stop”. She particularly liked receiving positive feedback from her peers as a result of the peer coaching process. She identified that she had been wanting to do this type of reflection of her own teaching for a while but had not been able to make that happen. Therefore, the peer performance feedback may have been reinforcing to her. It is possible that the reduced amount of performance feedback during this phase contributed to her descending trend in the faded support phase.

**Dyad Overview.** One month after intervention began, Dyad 2’s study was paused for one month because of a close contact quarantine for two weeks that ended when a two-week holiday school break began. However, both Garrett and Ginny were able to maintain consistent fidelity after the pause. Except for during maintenance, Garrett and Ginny had similar trend patterns across the phases of the study. Garrett’s trends presented consistently steeper than Ginny’s, but visual analysis shows them remarkably comparable except for maintenance where they were opposite from one another. Additionally, both Garrett and Ginny revealed their highest means during the initial implementation phase and both were approaching or slightly above the target ratio (Figure 5.1). The similarities within this dyad, paired with the commonalities found with
Dyad 1, suggest once again that the dyad may be considered an active ingredient in implementation efforts. Suggestions for further research will be discussed later in the chapter.

**Across Participants**

The focus of this study was to determine if the designed intervention improved teacher ratios of positive interactions with their students and if improvement occurred, that the change in behavior sustained across time. The high variability of the data along with the challenging context of the study, due to the COVID-19 pandemic, creates challenges with drawing strong conclusions. However, there are some across participants’ findings to consider regarding impact, fidelity, and social validity of the intervention.

**Impact.** My examination of the data across participants indicated a low, approaching moderate, effect size (TAU-U = 0.18, \(p = 0.02\)). None of the participants reached the criteria for an effect through PND. Visual analysis showed some common patterns within each dyad indicating that the dyad may be an active ingredient within the multi-component intervention. As discussed previously, three out of four participants demonstrated higher than baseline mean ratios across intervention phases (Figure 5.1). This implies that the intervention may have had some desired impact on teachers’ ratios of positive-to-negative teacher/student interactions. Yet, there is not strong enough data to determine a significant intervention effect or functional relationship.
**Maintenance.** Both applied behavior analysis (Cooper et al., 2007) and implementation science (Fixsen et al., 2005) suggest that the sustainability of a newly learned behavior is more probable if supports are faded gradually rather than abruptly ending a treatment. For this study, peer observations occurred weekly after the treatment was applied. Peer observations then became bi-weekly and continued for approximately two months. Unfortunately, there were no conclusive results regarding maintenance of the behavior. Rosanna and Reilly (Dyad 1) presented with stable baselines with trendlines below both their initial intervention and faded support phases. Garrett had a descending trendline during maintenance and Ginny’s was ascending. The variability in maintenance performance coupled with variability across dyads suggests that a longer faded support phase may be required to reach performance stability and full potential benefits of this intervention. As explained in Chapter 3, finding participants for this study was extremely challenging. When study procedures were introduced to the participants, they indicated hesitancy to participate in such a long study. To counter that concern, I indicated maximum durations for each study phase. As each dyad approached the maximum duration of
the initial intervention phase (12 weeks), adherence to daily recording began to wane. Therefore, given the significant variability in the data and relatively stable trendlines in three of the participants during the initial intervention phase, I moved them into the faded support phase at 10 weeks (Dyad 1) and 11 weeks (Dyad 2). The faded support phase was set with a maximum duration of 8 weeks. Adherence to study protocols continued to wane, especially within Dyad 1. Concerned about participant attrition paired with time constraints of the school year and a lack of stable performance, the decision was made to end the faded support intervention at six weeks. Given the variability of maintenance trends it is possible that had the faded support continued for the full 8 weeks or potentially longer, maintenance results could have been different.

**Fidelity.** Results of this study point to two primary fidelity of implementation influences – the use of natural implementers as coaches and the impact of the COVID-19 pandemic. A study by Gilmour et al. (2017) claimed that levels of adherence and quality to intervention protocols were significantly higher when delivered by university-based coaches rather than school-based coaches. While this level of analysis was beyond the scope of this study, for each participant, I randomly compared data gathered completed by the peer coach to the data collected by the research team. Each time, inconsistencies were found. As mentioned previously, Rosanna had recognized the inaccuracies in her peer coach’s data and experienced some frustration as a result. On the other hand, peer-coaching encourages accountability, promotes collegiality, and is cost-effective for schools (Johnson et al., 2017; Latz et al., 2008; Ma et al., 2018; Pearce et al., 2019; Soisangwarn & Wongwanich, 2014). Therefore, while relying on a peer for timely, accurate performance feedback may impact fidelity, the benefits gained may outweigh the inaccuracies, delays, and impaired fidelity.
Through email communication with me about study protocols, each participant indicated, at least once, that the COVID-19 pandemic has made this school year harder than any other they had experienced yet. They often indicated that factors such as the unpredictable schedule, the extra work required to instruct students in multiple formats (in-person, remote, hybrid), and the persistent worry and concern for adherence to health and safety guidelines hindered their capacity to remember to record themselves, complete the peer performance feedback or focus on how they interacted with students. In her end-of-study interview, Ginny claimed "Everything about this year has been crazy".

Fidelity of implementation is critical to determine efficacy of an intervention (McKenna et al., 2014). Garrett and Ginny were able to provide performance feedback in a consistent, timely way whereas Rosanna and Reilly experienced more inconsistency and delays. Additionally, the performance feedback provided was not always accurate or consistently timely within either dyad. Therefore, fidelity of implementation may have impacted the effect of this intervention.

Social Validity. Each of the participants would recommend this intervention as a way to support novice teachers. Furthermore, they found the study to be easy to use, feasible, and worthy of their time. There was also strong agreement that they perceived improvement in their teaching practices and student behavior. An important focus of this study was to identify a low-cost, feasible intervention to improve novice teachers’ use of EBCM practices, specifically their positive-to-negative teacher/student interaction ratio. The effect of the intervention is inconclusive; however, findings indicate that this multi-component peer coaching model was perceived as valuable, relevant, and manageable to novice teachers. Furthermore, evidence
emerged that components of the study, such as peer performance feedback, were perceived as potentially reinforcing to the participants.

As explained previously, this study occurred during a pandemic that significantly impacted teaching and learning. Additionally, this study lasted seven months. During that time, participants were asked to record themselves daily and take on the routine task of watching a peer’s video and providing performance feedback. Even under normal conditions, participant attrition during long studies is a concern (Kubitskey et al., 2012). Yet, all four of the participants in this study remained engaged. Learning more about what sustained them through end-of-study interviews revealed that there were several reinforcing features associated with their participation in the study.

For behavior to sustain over time, it must be reinforcing to the individual (Cooper et al., 2020). The theoretical hypothesis of this study was that novice teachers would experience improved student behavior as their positive-to-negative teacher/student interaction ratio increased. Improved student behavior would serve as a reinforcing consequence, causing the novice teacher to continue to engage in more positive interactions with students and fewer negative ones. Each participant indicated experiencing desirable outcomes due to changes in student behavior, such as students appearing happier, less disruptive, and more engaged, confident and likely to ask questions. They also believed that their relationships with students were positively impacted and that noticing the positive in students strengthened their classroom community.

Another reinforcing outcome of this study was the novice teachers’ perception of increased awareness and improvement of their teaching practices. Each participant indicated that engaging in this intervention led to more reflection and analysis of how they interacted with
students. It also shaped their thinking to realize the effect that their behavior has upon their students.

While each participant was pleased with the perceived changes in behavior for both themselves and their students, the collecting and sharing of performance data was also indicated as highly reinforcing. This held true whether they chose to watch their own videos and conduct self-monitoring or if they solely relied on performance feedback from their peer coach. Gaining performance feedback in an easy-to-follow graph allowed them to engage in data-driven reflection and decision-making about their future behavior. They each expressed anticipation over receiving their performance feedback each week. Two participants shared that they began to see it as a competition for themselves as they were always trying to increase the score each week.

Lastly, the desire to support future teachers as well as to follow through on a commitment points to motivators for their sustained participation in this study. While there may not be sufficient evidence of a significant impact, social validity findings suggest that this study may be worthy of replication during a more stable, predictable academic year. Implications for practice, research and policy resulting from findings from this study will be discussed in the next section.

**Implications**

Despite inconclusive results, findings from this study do offer potential implications to the field in terms of practice, research, and policy.

**Practice**

The challenge to support teachers in delivering EBCM strategies at levels needed to impact student behavior continues to vex practitioners and educational researchers (Cook et al., 2019; Horner & Sugai, 2018; Sanetti & Collier-Meek, 2019). Developing an intervention with the proper contextual “fit” for demanding classroom environments and multi-tasking teachers
would be beneficial to the field (Cook et al., 2019). The findings from this study lead to the following considerations for future interventions:

- Include regular prompts, such as a weekly email, to enhance fidelity. Participants in this study consistently expressed gratitude for the regular reminders and indicated that it was a key factor in them actually completing the task.

- Engage the participant in routines, such as a daily recording, that are feasible, practical, uncomplicated, embedded into the classroom schedule. Repeatedly, participants in this study pointed to the daily recording serving as a prompt for them to spend 15 minutes each day focused on providing positive feedback to the students. Over time, it became more habitual to do so but, the requirement of recording each day served as the cue for that behavior to occur.

- Avoid doling out resources to promote learning and fidelity all at once. Rather, consider adding booster sessions, sharing resources weekly, or promoting problem-solving conferences as needed. The study was originally designed for peer conferences to occur if data did not show improvement in positive-to-negative teacher/student interaction ratios. Due to the complexities of this school year and concern over participant attrition, these conferences were not able to occur. Furthermore, during end-of-study interviews, the participants had little memory of the resources provided at the start of the intervention. This suggests that sharing resources may be better to do periodically so they serve as boosters to their learning and implementation efforts.

- If using natural implementers as coaches, consider using “graduates” of the intervention to support the new implementers as a way to increase accuracy of
information and to serve as models as effective practice. If this is not possible, periodic accuracy checks with corrective feedback may be beneficial.

- Incorporate short-term reinforcement into the intervention. While student behavior change is a positive, reinforcing impact for most teachers, it does not always have an immediate effect. Additionally, positive student behavior change can become normalized over time. The hope is for the behavior to become self-reinforcing, however, embedding reinforcement such as performance data, into the intervention may provide the additional reinforcement necessary until the behavior becomes habitual and durable.

- Use technology to enhance intervention implementation and overcome barriers. For example, due to the COVID-19 pandemic, study procedures pivoted from in-person data collection to use of daily video recordings being uploaded to a virtual platform. This adjustment resulted in two significant but unintended positive outcomes:
  
  o When finding participants became so challenging, geographical proximity was no longer necessary for creating dyads. This same concept can be applied to schools, such as remote, rural, or small, where there may not be enough novice teachers to support the creation of dyads to serve as peer coaches to one another.

  o The act of daily recording served as a prompt or cue to the participants to focus on providing positive feedback to their students. This may be beneficial to incorporate into future interventions.
Research

Darling-Hammond’s review of effective professional development outlined seven core features to support durable improvement in teaching practices. This professional development intervention included six out of the seven (a) incorporates active learning, (b) supports collaboration, (c) uses models of effective practice, (d) provides coaching and expert support, (e) offers feedback and reflection, and (f) is of sustained duration. The remaining core feature is to be content-focused. Future studies seeking to improve positive-to-negative teacher/student interaction ratios should consider embedding the intervention into curriculum content to determine if it enhances outcomes of the intervention.

The similar patterns in performance data presented by each participant within each dyad supports consideration for the dyad as a potential “active ingredient” within the multi-component intervention. Further research could broaden the understanding of any specific dynamics within the dyad that may have contributed to that finding. This enhanced knowledge may contribute to future intervention implementation efforts.

The use of technology was invaluable to this study due to the COVID-19 pandemic. When this study was first conceptualized, integration of technology was very limited. However, if technology, such as video recording, virtual platforms, and email, had not existed, this study would have been paused and unable to be completed at this time. This points to the value of technology in sustaining educational research even during challenging times.

Lastly, while the results of this study are highly variable and inconsistent, there is evidence to support that replication of this study during non-pandemic, more stable times, would be worthy of further exploration.
Policy

State and school district leaders should include statements of commitment to educator use of evidence-based practices in school settings. However, supports for implementation fidelity should also be considered. Even after an intervention of sustained duration, the participants of this study struggled to meet target of a 5:1 positive-to-negative teacher/student interaction ratio. This finding, paired with the high variability of their ratios signals and affirms the need for enhanced support for novice teachers. If the goal is to increase the retention of novice teachers so they can have a positive impact on student outcomes, it is important for policy leaders and district administrators to promote effective and feasible professional development and growth-oriented performance feedback for novice teachers.

Limitations

COVID-19 Pandemic

This study occurred concurrently with a global pandemic which broadly uprooted organizational, professional, and personal routines, systems, and for many people, their general well-being (Collie & Martin, 2020; de Oliveira Silva et al., 2021; Marroquin et al. 2020). As a result of educational systems being uprooted, educational research was significantly disrupted. (Levine et al., 2021) Teacher well-being throughout the course of the COVID-19 pandemic has been a consistent concern and multiple surveys indicate that large numbers of educators may choose to leave the field at the end of this school year (Carver-Thomas et al., 2021; de Oliveira Silva et al., 2021). Moreover, even before the pandemic, stressed teachers struggled to implement evidence-based classroom management practices with fidelity (Larson et al., 2018). The COVID-19 pandemic undoubtedly limited the potential impacts of this study as well as any opportunities to generalize the findings.
Participation

Finding even four participants for this study was extremely challenging. To determine a functional relationship for the intervention, three dyads were required. After an exhaustive search for participants beyond the four that agreed to participate, the decision was made to move forward with the study nevertheless. Of course, this led to very limited results and validity. Expanding the study to more participants will be necessary to determine if the intervention has any significant effects.

Threats to Internal Validity

While every attempt was made to ensure that the participants followed the intervention protocols, only accessed the resources provided, and watched only their peer videos, some threats to internal validity occurred due to the natural context of this study. For example, during end of study interviews, three out of four participants revealed they had watched some of their own videos. Rosanna indicated she paired her participation in this study with one of her professional evaluation goals. Unexpectedly, Reilly received the explicit instruction portion of the intervention treatment while she was driving rather than being able to fully attend and focus during the Zoom meeting. Additionally, as explained previously, participant fidelity to the intervention varied. These examples demonstrate how there was some variability in how the participants experienced the intervention and therefore, may have impacted their results.

Technology

This study relied heavily on technology. Health and safety precautions prohibited data collectors to enter school environments. Therefore, the study protocols pivoted to daily video recording by the participants. While this pivot allowed flexibility with pairing participants as dyads across schools and states, it also led numerous technical issues. For example, there were
many days where the participants had recorded themselves, however, they were unable to successfully upload it onto the virtual platform. At times this grew frustrating for the participants and it may have led to diminished motivation. Thus, several potential data points were lost as a result.

Other than pre-study interviews to obtain consent, the actual intervention, and an end-of-study interview, all communication between me and the participants occurred over email. Therefore, my ability to fully recognize how well they understood how to implement the strategies and protocols was likely diminished.

**Natural Context**

Unexpected interruptions and disrupted schedules are commonplace in classroom and school environments. The global pandemic added to that unpredictability by causing unexpected school closures and quarantine periods. Additionally, the natural flow of school vacations, testing schedules, and the ending of the school year impacted the length of the study and consistency of data collection.

**Researcher Bias**

As the primary researcher throughout all phases of this study, an increased risk of bias in study results may be present (Kazdin, 2011). Efforts to diminish this potential bias included hiring seven data collectors to gather the data weekly across participants. I collected IOA data on at least 25% of the observations across all phases. Additionally, an independent observer watched the intervention delivery videos and monitored fidelity.

**Conclusion**

High levels of positive feedback from teachers leads to positive outcomes for students (e.g., Caldarella et al., 2020; Cook et al., 2017; Cooper et al., 2018; Reinke et al., 2014a). Yet,
this low-impact, high-intensity strategy is consistently hard for teachers to deliver at levels that impact student behavior (e.g., Freeman et al., 2018; Hopman et al., 2018). This study aimed to develop an intervention to promote high positive-to-negative teacher/student interaction ratios in novice teachers. While the results did not point to a functional relationship between the intervention and the target behavior, this study does lend itself towards further understanding of how to support fidelity of implementation and promote social validity with future interventions for novice teachers. As recognized by Ginny, “each kid learns differently, but also responds differently to how you react to them. Finding the different ways to interact with them is so helpful. It’s more than just positive words it’s also about positive actions.” Finally, this study signals the critical need to provide evidence-based support for EBCM practices to novice teachers as they embark upon their careers and seek to positively impact their future students.
REFERENCES


Appendix A

Recruitment Posting/Announcement/Email

You are invited to participate in a research study. The research is being conducted by Karen Robbie, under guidance of Dr. James Artesani, Associate Dean of Graduate Education, Research, and Outreach. Both researchers are affiliated with the University of Maine’s College of Education and Human Development. You must be a K-5 teacher with less than 5 years of experience to participate. The purpose of the research is to explore the impact of a professional development intervention on novice teachers’ use of specific classroom management practices. All data collected will be kept confidential.

If you decide to participate, you will be asked to:

- complete a brief survey about your teacher preparation and novice teacher experiences
- record yourself daily for a 15-minute instructional block from September 2020-April 2021 to be uploaded to a secure shared site to be reviewed by researchers*
- engage in a brief virtual training (about 30 minutes) on the effective use of evidence-based classroom management skills
- be paired with another novice teacher to serve as your peer coach
- develop an action plan to help you implement the new skills
- observe a peer’s 15-minute video and provide performance feedback (weekly for 8-12 weeks, then bi-weekly)
- if needed due to performance levels and/or significant disruptions to the study, participate in brief booster sessions and problem-solving meetings between you, your peer coach, and the primary researcher.

*After 1-2 weeks, if the data indicates that your use of specific classroom management skills is already high, I will share your data with you and let you know that you would not benefit from the rest of the study. Participants who agree to participate in the study but are determined to not benefit from the rest of the study, will be emailed a $10 Amazon gift card.

At the end of the study, I will share the data collected. You will also be asked to complete a post-survey questionnaire and ask for your feedback about the intervention.

Participation in this study may increase your knowledge use of effective classroom management practices. Additionally, multiple resources to support your use of classroom management practices will be shared with you. To acknowledge your participation in the study, you will be provided a $50 gift card (chosen from several places such as Amazon, Irving Gas, or other retailers) upon completion of the study. If you withdraw early from the study, you will not receive compensation.

If you would be interested in learning more or participating in the study, please reply to this email or contact me at (207) 286-4785.
Thank you for your time.

Sincerely, Karen Robbie
Appendix B

Multi-component Intervention Package Protocol

<table>
<thead>
<tr>
<th>Phase</th>
<th>Dyad of Novice Teachers</th>
</tr>
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<tbody>
<tr>
<td>Treatment</td>
<td>Participants accessed the treatment by joining a Zoom call with the researcher and their peer coach. Participants were guided through slides (Appendix C) which:</td>
</tr>
<tr>
<td></td>
<td>1. Reviewed Supporting and Responding to Behavior: Evidence-Based Classroom Management Strategies for Teachers with targeted focus on:</td>
</tr>
<tr>
<td></td>
<td>a. Acknowledgement (p. 12-13)</td>
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<td></td>
<td>b. Error Correction (p.15-17)</td>
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<td></td>
<td>2. Presented research on impact of 5:1 positive-to-negative student-teacher interaction ratio (Lamotte, 2020)</td>
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<td></td>
<td>3. Introduced them to their graphed baseline data (Appendix D).</td>
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<td></td>
<td>4. Asked them to complete a post-test to check for understanding of positive and negative interactions (Appendix E).</td>
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<td>5. Showed a video (Random House, 2015) and slides which provided explicit instruction on:</td>
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<tr>
<td></td>
<td>a. Power of Habit</td>
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<tr>
<td></td>
<td>b. Habit Loops</td>
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<td>6. Shared additional resources and asked participants to collaborate and develop an action plan to reach the goal of a 5 positive: 1 corrective student-teacher interaction ratio (Appendix F).</td>
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<td>7. Explained the procedure for providing performance feedback to their peer (Appendix G.</td>
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</table>

| Intervention           | Participants recorded themselves daily during the same instructional block (ex. Literacy). Peer viewed one recording weekly and completed the Peer Direct Observation Tool (Appendix H). Performance feedback was provided through email to the participant weekly including frequency of teacher behavior (general praise, specific praise, specific correction, general correction). |
|                        | A graph representative of continuous performance (baseline to present) was sent to the novice teacher via email weekly by the peer coach (Appendix H). |

| Faded Support Intervention Phase | Recordings continued and Peer Performance Feedback Protocol switched to being done bi-weekly. |
Appendix C

Intervention Instruction
Appendix D

Baseline Performance Feedback Provided to Participants During Intervention Instruction

Dyad 1:

Garrett

Ginny

Dyad 2:

Rosanna

Reilly
## Appendix E

### Novice Teacher Understanding of Positive vs. Negative Teacher/Student Interactions

**Post-Test**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Positive Interaction</th>
<th>Negative Interaction</th>
<th>Not Sure</th>
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</thead>
<tbody>
<tr>
<td>Shhh!</td>
<td></td>
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<tr>
<td>Thank you for putting so much effort into your work!</td>
<td></td>
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<tr>
<td>You are working quietly and letting people stay focused! Nice job!</td>
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<tr>
<td>Instead of running into the hallway, walk next time.</td>
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<tr>
<td>Nicely done!</td>
<td></td>
<td></td>
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<tr>
<td>This group used an appropriate voice level during group time.</td>
<td></td>
<td></td>
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<tr>
<td>Excellent!</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No!</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>You turned your assignment in late, it needs to be on time in the future.</td>
<td></td>
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<tr>
<td>You are doing a great job paying attention to your friends’ presentations.</td>
<td></td>
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<tr>
<td>You are distracting others who are working, stay focused.</td>
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</table>
Appendix F

Sample Habit-based Action Planning Tools

Monitoring the Use of Positive Feedback

It is important to check on the use of feedback in classroom and non-classroom settings, both for fidelity of implementation and to determine if the rate of positive feedback students are earning is optimal for the environment you desire. Fidelity checks will determine if the majority of staff are effectively using contingent positive feedback for student behavior as described earlier in the chapter. In addition, the goal is always to maintain a 4 to 1 ratio of positive responses to correction. Checks can also determine if this optimal ratio is being met. Both a fidelity check and a ratio check will provide information for the SW-PBS Leadership Team to determine how to support staff to effectively encourage student behavior.

There are a number of ways to do this monitoring:

**Observation.** Do a simple observation and tally staff responses to positive student behavior and misbehavior. Periodically observe and record occurrences of positive feedback for a short time duration (5-10 minutes) and compare like settings and situations (e.g. classroom to classroom, cafeteria, etc.). These observations can be done by pairing teachers to do peer observations, or the SW-PBS Leadership Team members observing in non-classroom settings. For example, frequency of interactions in each hallway might be compared or during whole group lessons in all classrooms. If this tallying is done periodically throughout the year, the ratio can be compared over time. A simple format for tallying frequency of positive and negative attention follows in Figure 18.

**Monitoring use of School-wide tangibles.** If a school-wide raffle is used, tickets can simply be counted prior to the raffle. If student and staff names are on tickets, that data can be collected as well as the overall number. Classroom teachers can submit weekly counts to a designated person in the building who can then create regular reports of the number of tickets earned per class, grade level, or for the building as a whole. A visual graph of tickets earned per week or month can serve as a reminder to staff to focus on giving students feedback for expected behavior.

**Self-monitoring.** It’s important that all staff get information about their personal efforts to respond to students who are displaying expected behavior, especially as staff are first learning how to effectively give specific, contingent feedback. Individual self-monitoring is one way to do this. Remember this data collection does not need to occur for the duration of an entire day. Rather, pick a 5–10 minute period and consistently collect over a few days each week. There are a number of easy ways to collect the rate of responses to positive student behavior compared to corrections, such as:

- Move pennies or paperclips from one pocket to another when positive student behavior is recognized. Put pennies or paperclips in one pocket when positive student behavior is recognized and use another pocket to collect pennies for corrections.
Encouraging Expected Behavior

- Tear an index card to collect the number of positive responses to corrections.
- Make tally marks on a piece of tape on your arm or post-it note on clipboard.
- Move popsicle sticks into cans.

Remember as you are observing or self-monitoring, it is the student behavior that is occurring at the time of the interaction, not the tone of the interaction, which determines whether an interaction is positive or negative.

**Frequency and Type of Student Interactions**

Teacher: ___________________________ Observer: ___________________________

Date: ___________________________ Time: ___________________________ Activity: ___________________________

<table>
<thead>
<tr>
<th>Attention to Positive, Appropriate Student Behavior</th>
<th>Attention to Negative, Inappropriate Student Behavior</th>
</tr>
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</table>

Ratio of Interactions: ______ attention to positives: ______ attention to negative

Notes:

---

*Figure 18*

Adapted from Sprick, R., Knight, J. Weinke, W., & McKale, T. (2006)
Effective Classroom Practices to Habits
Worksheet

Name: ___________________________ Date: ____________

Complete your Habit Loop below for the Identified Classroom Practice.

1. **In Box A below** -- Identify the targeted classroom practice that is the focus of the training today & describe specifically how you could implement this practice in your classroom; what would it look like? Sound like?

2. If you are currently engaging in a different routine or ‘bad habit’ instead of the targeted classroom practice? Write your “Current Habit” or routine in **Box B** below.

3. **In Box C**, identify the **Cues** that will signal use of the Targeted Classroom Practice (this may be the same signal that is currently cueing your ‘bad habit’).

4. **In Box D**, identify the **Rewards** you will experience from engaging in your Classroom Practice (may be some of the same rewards experienced through current ‘bad habit’).

5. Rate your commitment to implementing the identified practice in your classroom?

<table>
<thead>
<tr>
<th>Not at All</th>
<th>2</th>
<th>Somewhat</th>
<th>4</th>
<th>Extremely</th>
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<tbody>
<tr>
<td>1</td>
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<td>3</td>
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Borgmeier (2012) Portland State University
Appendix G

Peer Coaching Protocol

Your peer coach will be:
Your peer coach’s email address is:

To provide your peer with performance feedback, please complete the following steps:

- Watch your peer’s 15-minute video weekly by:
- Tally teacher-student interactions using the Peer Observation Tool.
- Add the data on the Peer Coach Performance Feedback Form.
- Send an email to your peer including:
  - The Peer Observation Tool for the week (share as a Google Doc, if preferred)
  - A downloaded, updated Peer Coach Performance Feedback chart (JPEG or PDF version)
  - Please copy karen.robbie@maine.edu on the email
- Continue to do this weekly until you hear from the researcher

Please reach out to Karen Robbie at karen.robbie@maine.edu or (207) 286-4875 with any questions or concerns, you may have!

_Thank you for your time and cooperation with this important work!  
You are helping to contribute valuable knowledge to the field of education  
and supporting future new teachers!_
Appendix H

Peer Performance Feedback Documents

Peer Observation Tool
(15 minutes)

<table>
<thead>
<tr>
<th>Participant Name:</th>
<th>Date:</th>
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<tbody>
<tr>
<td>Start Time:</td>
<td>End Time:</td>
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</table>

Instructional Activity Observed

Interactions with Students
Instructions: Make a tally mark in the corresponding box for each type of statement that occurs during the observation session. Add the total number of positive, praise and specific praise statements, then add the total number of coaching and non-specific error corrections. Divide the number of positive interactions by the total number of positive interactions to determine the ratio.

General Positive (e.g., "Great job!")
Specific Positive (e.g., "You did a great job!"")
Non-Specific Error Correction (e.g., "Stop doing that!")
Specific Error Correction (e.g., "Where did you go wrong?")

Total
Total Positive Interactions: Total Corrective Interactions:
Ratio of Positive to Corrective Interactions: 1 (To calculate divide number of positives by number of negatives)

<table>
<thead>
<tr>
<th>Participant:</th>
<th>Date</th>
<th>Session Number</th>
<th>General Positive</th>
<th>Specific Positive</th>
<th>Specific Error Correction</th>
<th>Non-Specific Error Correction</th>
<th>Pos-Neg Ratio</th>
<th>Target Pos-Neg Ratio</th>
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<tbody>
<tr>
<td>Peer Coach</td>
<td>1</td>
<td>2</td>
<td>1</td>
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</tbody>
</table>

Baseline Data

- General Praise
- Specific Praise
- Specific Error Correction
- Non-Specific Error Correction
- Pos-Neg Ratio
- Target Pos-Neg Ratio

Observations

Sessions
## Appendix I

### Operational Definitions of Targeted Teacher Behaviors

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Definition</th>
<th>Example</th>
<th>Non-example</th>
</tr>
</thead>
</table>
| Specific Praise  | Positive statement given after student engages in desired behavior to inform students specifically what they did well. | “Nice hand raise!” (social behavior)  
“You stuck with that problem and figured it out. Well done!” (academic behavior) | “Thanks!”  
“You did it!” |
| General Praise   | Positive statement given after student engages in desired behavior but does not inform students specifically what they did well. | “Nice!”  
“You got into line quickly. Good work!” | |
| Specific Corrective | Statement given when an undesired behavior occurs that informs student specifically what their error was. | “Instead of talking out, please raise your hand.”  
“Rather than leaving blanks, ask for help.” (academic behavior) | “Enough of that!”  
“That’s not helpful.” |
| General Corrective | Statement given when an undesired behavior occurs that does not inform student specifically what their error was. | “Stop!”  
“Stop talking to your friend and get started on your work.” | |
Appendix J

Novice Teacher Pre-Study Survey

Pre-service and Teacher Experience
1. How long have you been a teacher?
2. What have you taught (grade, subject)?
3. What do you think it was that made you want to become a teacher?
4. What is the best thing about being a teacher? What excites you about teaching?
5. What do you think is the most difficult or hardest thing about being a teacher?
6. Do you believe that your teacher preparation program adequately prepared you for your role? Why or why not?
7. Do you recall engaging in instructional content about evidence-based classroom management practices throughout your teacher preparation program? If so, what are key takeaways that you remember?
8. Did you have opportunities to practice implementing evidence-based classroom management practices throughout your teacher preparation program? If so, please provide an example.

Classroom Management Experience
1. What are some strategies you use in your classroom to help with classroom management?
2. What are some things you feel you need to work on regarding classroom management?
3. How do you handle misbehavior in your classroom?
4. What classroom management strategies have you found to be most effective?
5. What strategies have you found to be ineffective?

Novice Teacher Support
1. Do you believe that you have received adequate support as a novice teacher? If so, where did that support come from?
2. Have you received assistance in implementing evidence-based classroom management practices?
Appendix K

Teacher Intervention Survey

Social Validity Measure*

Please answer the following questions on a scale of 1-5.
1: Strongly Disagree
2: Slightly Disagree
3: Neither Agree or Disagree
4: Slightly Agree
5: Strongly Agree

1. This intervention improved my ability to use evidence-based classroom management skills. ____
2. This intervention increased appropriate behavior in my students. ____
3. This intervention decreased inappropriate behavior in my students. ____
4. This intervention was easy to use. ____
5. This intervention took more effort than it was worth. ____
6. This intervention should be recommended to schools to aid in the development of novice teachers’ classroom management skills. ____

*Adapted from VanLone, J. (2018). The Effects of Video Self-Analysis on Pre-Service Teachers' Use of Behavior Specific Praise.
Appendix L

Social Validity Interview Questions

1. Please tell me about your experience participating in this study.
2. Do you think the COVID-19 pandemic impacted your participation in this study? If so, how?
3. What, if anything, did you find helpful to your professional development?
4. What, if anything, did you find not helpful to your professional development?
5. If a novice teacher were to participate in this intervention, they would only need to record themselves once each week and share that with their peer coach, rather than the daily recordings necessary for the research study. How feasible do you think that would be?
6. What types of learning occurred for you as a result of this study?
7. Please tell me what you think of the performance feedback process.
8. Describe the relationship with your peer coach.
9. What shared resources did you find most helpful? Why? How did you use them?
10. How has your classroom environment been impacted by this intervention?
11. How would you describe this intervention to a colleague?
12. You stuck with this study for many months during a really challenging time in education. What made you stick with it?
13. What is your biggest takeaway from this experience?
14. What, if anything, would you recommend changing about this intervention? Why?
15. What else should I have asked about? Is there anything I else I should know?
Appendix M

Teacher Consent Form for Participation in a Research Study

Principal Investigator: Karen Robbie M.S., C.A.S., supervised by Dr. James Artesani Ed.D.
Study Title: Using Peer Supports to Improve Positive-to-Negative Teacher/Student Interaction Ratios by Novice Teachers

You are invited to participate in a research project being conducted by Karen Robbie, a graduate student in the Department of Education at the University of Maine and supervised by Dr. Jim Artesani of the Department of Education at the University of Maine. The purpose of the research is to explore the impact of a professional development intervention on novice teachers’ use of specific classroom management practices. You must be a K-5 teacher within the first 5 years of your career and at least 18 years of age to participate.

What will you be asked to do?
If you decide to participate, you will be asked to:
- complete a brief survey about your teacher preparation and novice teacher experiences
- record yourself daily for a 15-minute instructional block from September 2020-April 2021 to be uploaded to a secure shared site to be reviewed by researchers
- engage in a brief virtual training (about 30 minutes) on the effective use of evidence-based classroom management skills
- be paired with another novice teacher to serve as your peer coach
- develop an action plan to help you implement the new skills
- observe a peer’s 15-minute video and provide performance feedback (weekly for 8-12 weeks, then bi-weekly)
- if needed due to performance levels and/or significant disruptions to the study, participate in brief booster sessions and problem-solving meetings between you, your peer coach, and the primary researcher.

*After 1-2 weeks, if the data indicates that your use of specific classroom management skills is already high, I will share your data with you and let you know that you would not benefit from the rest of the study

Researchers will review and collect data on your daily 15-minute recordings throughout the entire study. At the end of the study, I will share the data collected. You will also be asked to complete an online post-survey questionnaire and ask for your feedback about the intervention. This questionnaire will take 15-20 minutes.

Risks
Your time and inconvenience are the only risks to participating in this study.

Benefits
First, I hope that you may learn or increase your use of effective classroom management practices. Second, multiple resources to support your use of classroom management practices will be shared with you. Third, the purpose of this study is to evaluate the effectiveness of an intervention, using natural implementers, that can be used in schools regardless of their resource capacity. Providing such an intervention, may result in effectively supporting novice teachers during a crucial stage of their career and hopefully lead to increased student achievement and positive classroom environments.

Compensation
To acknowledge your participation in the study, you will be provided a $50 gift card (chosen from several places such as Amazon, Irving Gas, or other retailers) upon completion of the study. If you withdraw early from the study, you will not receive compensation. Participants who agree to participate in the study but are determined to not benefit from the rest of the study, will be emailed a $10 Amazon gift card.
Confidentiality

Your name will not be on any of the data. A pseudonym will be used to protect your identity. A paper key linking your name to the data will be kept separate from the data in a locked drawer and destroyed by December 31, 2023. Access to the raw data will be limited to the primary data collectors and investigators. Your name or any other identifying information will not be reported in any publications from this study. Observational data and collected documents will not include names of individuals. Schools and teachers will be provided pseudonyms to ensure confidentiality. Observation data and documents will be kept indefinitely. All notes and documents will be stored in a locked drawer and/or password protected computer. Survey responses and electronic data will be stored in the researcher’s password-protected computer. Hard copy raw data will be stored in a secured location (i.e. locked file cabinet) until December 31, 2025. Video recordings will be uploaded to a secured GoReact platform. Video recordings will be viewed only by individual participants, their peer coach, the researcher and trained data collectors. Video recordings will be destroyed by December 31, 2023.

Voluntary

Participation is voluntary. If you choose to take part in this research, you may stop at any time. You may skip any questions you do not wish to answer. If you have allowed a researcher to observe your classroom, you can tell the researcher to leave at any time.

Contact Information

If you have any questions about this study, please contact the primary researcher at 207-286-4785 or karen.robbie@maine.edu. You may also reach the faculty sponsor on this research at 207-581-4061 or arthur.artesani@maine.edu. If you have any questions about your rights as a research participant, please contact the Office of Research Compliance, University of Maine, 207/581-2657, umric@maine.edu.
Appendix N

Site Permission Email for School Administrators to Send to Researcher

DATE:
TO: Karen Robbie (karen.robbie@maine.edu)
FROM: (Principal Name, School Name)

RE: Permission to conduct research at (School Name)

I am writing this letter to document my permission to allow the Using Peer Supports to Improve Positive-to-Negative Teacher/Student Interaction Ratios by Novice Teachers study to be conducted at (School Name).

I understand that classroom teachers will be asked to videotape segments of their teaching which will be uploaded for analysis. In the event of remote instruction, a researcher may join virtual class sessions through Google Meets, Zoom, or other virtual meeting platforms utilized by the school. Analysis of the videos will primarily be focused on behaviors of the teacher. No identifying information will be collected on the students. The classroom teacher will be responsible for disseminating parent notification forms and will be asked to attend a training meeting and a closing meeting which will happen through a videoconferencing platform such as Zoom or Google Meets.

To support this project, I agree to:
(a) inform cooperating teachers to let them know about the study
(b) contact you if there are questions or concerns throughout the study (or at any time).

____________________________________________
Signature
Appendix O

Parental Notification Form Regarding Participation in a Research Study

Principal Investigator: Karen Robbie M.S., C.A.S., supervised by Dr. James Artesani Ed.D.
Study Title: Using Peer Supports to Improve Positive-to-Negative Teacher/Student Interaction Ratios by Novice Teachers

Researchers from the University of Maine are conducting a research study at your child’s school. The purpose of this research study is to determine the effectiveness of an intervention designed to improve classroom teachers’ classroom management skills.

What are the study procedures? What will my child be asked to do?
Daily fifteen-minute video recordings will be conducted from September 2020-April 2021. Your child may be observed during this process, but the focus of the research is the classroom teacher, not the students. Your child will not have interaction with the researchers. In the event of remote instruction, a researcher may join virtual class sessions through Google Meets, Zoom, or other virtual meeting platforms utilized by the school. If you DO NOT want your child to be videotaped, we will ask the classroom teacher to arrange the video recording device so that your child is not on camera during video recorded lessons.

Whom do I contact if I have questions about the study?
If you have any questions about this study, please contact the primary researcher at 207-286-4785 or karen.robbie@maine.edu. You may also reach the faculty sponsor on this research at 207-581-4061 or arthur.artesani@maine.edu.

You only need to return this form to your child’s teacher by (insert date) if you DO NOT want your child to be videotaped.

I have read this form and decided that I DO NOT want my child to be videotaped.

____________________________________  __________________________
Print Child’s Name  Print Name

____________________________________  __________________________
Parent/Guardian’s Signature  Date

Relationship (e.g., mother, father, guardian)
BIOGRAPHY OF THE AUTHOR

Karen Robbie was born in Schenectady, New York on October 19, 1969. She was raised in Loudonville, New York and graduated from Colonie Central High School in 1987. She attended Skidmore College and graduated in 1991 with a Bachelor’s degree in Elementary Education. She completed her Master’s degree at the University of Albany in 1994. She worked in elementary education until 2017 when she entered the Prevention and Intervention studies graduate program at the University of Maine. She now works for the University of Connecticut supporting the Center on Positive Behavior Intervention and Supports. Karen is a candidate for the Doctor of Philosophy degree in Education from the University of Maine in August 2021.