# Training and Coaching in Early Childhood Settings Improves Educators' Pyramid Model Practices and Children's Social Skills

### La formation et le coaching dans les centres de la petite enfance améliorent les pratiques des éducateurs selon le modèle pyramide et les aptitudes sociales des enfants

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## Abstract

*Throughout the past decade, research has demonstrated the importance of addressing young children's social-emotional development and that educators require knowledge on interventions designed to improve social-emotional learning. As children's early experiences impact their development, it is essential that educators working in early childhood settings receive training and support to promote social-emotional competencies. The present study was carried out in the province of Quebec. It evaluated the effectiveness of the implementation of the Pyramid Model (PM), a multi-tiered framework that promotes social-emotional competencies and prevents challenging behaviours in young children attending early childhood settings. Nine educators and 10 children participated in the study. Educators were provided with practice-based coaching (shared goals and action planning, focused observation, reflection, and feedback) following a two-day PM training session that was part of another study. A mixed-method design was used to assess the effects of PM implementation on the educators' practices, the children's social skills, as well as the intervention's feasibility and acceptability. Quantitative and qualitative data were combined to assess the social validity and feasibility of the intervention for the purposes of breadth and depth of understanding and corroboration. Also, a multiple baseline design across participants was employed to examine target behaviours in the educators and children. Significant improvements were identified in the educators' PM practices and the children's social skills. Educators reported that the intervention was feasible and expressed high levels of satisfaction with its implementation.*

**Résumé**

Au cours des dernières décennies, la recherche a montré l'importance de bien soutenir le développement socio-émotionnel des jeunes enfants dans les différents milieux éducatifs qu'ils côtoient. Notamment, la recherche souligne le besoin de veiller à une formation de qualité chez les éducateurs œuvrant dans les milieux de la petite enfance en ce qui concerne les bonnes pratiques en intervention dans ce domaine. À cette fin, la présente étude a permis d'évaluer les effets de la mise en œuvre du modèle d'intervention "Pyramide" (MP) afin de répondre aux besoins de formation des éducateurs dans des centres de la petite enfance partenaires ainsi que pour soutenir les compétences socio-émotionelles et prévenir les comportements problématiques chez les jeunes enfants fréquentant ces milieux. Une méthode mixte a été utilisée pour évaluer les effets de la mise en œuvre du MP sur les pratiques des éducateurs, les compétences sociales des enfants, ainsi que pour évaluer la faisabilité et l'acceptabilité de l'intervention. Neuf éducateurs et dix enfants ont participé à l'étude. Les éducateurs ont bénéficié d'un coaching basé sur la pratique (objectifs partagés et planification de l'action, observation ciblée, réflexion et retour d'information) à la suite d'une séance de formation de deux jours sur le MP. Un devis à niveaux de base multiples a été utilisé pour examiner les comportements ciblés par le programme chez les éducateurs et les enfants. Des données quantitatives et qualitatives ont été combinées pour évaluer la validité sociale et la faisabilité de l'intervention du point de vue des éducateurs. Des améliorations significatives ont été identifiées dans les pratiques associées au MP chez les éducateurs et dans les compétences sociales des enfants. Les éducateurs évaluent que l'intervention est réalisable dans leur contexte de travail et ont exprimé une grande satisfaction par rapport au MP, tant pour le développement de leurs compétences que pour ses effets auprès des enfants.

*Mots-clés* : comportements problématiques, coaching basé sur la pratique, milieux de la petite enfance, éducateurs, modèle pyramide, compétences sociales, formation

**Introduction**

**The Need to Promote Young Children's Social, Emotional, and Behavioural Development**

Across many jurisdictions internationally, there has been a substantial increase in the development of policies concerning integrating children with developmental disabilities (DD) (e.g., global developmental delays [GDD], autism spectrum disorders [ASD] and other developmental disorders) into regular early childhood settings[1] (Ainscow & César, 2006; Division for Early Childhood [DEC] & National Association for the Education of Young Children [NAEYC], 2009; Guralnick, 2001; Norwich, 2008; United Nations Educational,

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[1] The term early childhood settings is used in this study to refer to early childhood centres, early childhood programs, daycare, and preschools.

[2] In Quebec's (Canada) early childhood settings, where the current study was conducted, children are taught by early childhood educators. Therefore, for consistency throughout the article, teachers, educators, and early childhood educators are all referred to as educators.

Scientific, and Cultural Organization [UNESCO], 2015, 2017). This positive change provides several  benefits for all stakeholders, including the child, family, peers, and educators[2]. Some of the benefits of inclusion are that children and their families can participate in a wide range of activities within their communities and society, providing families with a sense of belonging, positive social relationships, and friendships (DEC/NAEYC, 2009).  However, this change also presents challenges and requires early childhood settings to plan and coordinate supports. For example, studies have shown that the integration of children with DD increases the training and support needs of stakeholders regarding the appropriate management of challenging behaviours (CB)[3] (the term CB refers to "behavior that is repeated, disrupts children's learning and interactions with others, and is unresponsive to typical, developmentally appropriate guidance strategies" [Virtual Lab School, 2021]) and academic issues (National Research Council & Institute of Medicine, 2009; McCabe & Frede, 2007; Rivard et al., 2015). In neurotypical children between the ages of 2 and 5 years, social and emotional behavioural challenges are common and are estimated to be present in 10 to 20% of children (Lavigne et al., 2009). Furthermore, these challenges are more frequent (e.g., 68 to 94%) in children with ASD (Jang et al., 2011; Kanne & Mazurek, 2011), and more intense, and complex in children with DD (Holden & Gitlesen, 2006; Myrbakk & Von Tetzchner, 2008). Research has demonstrated that early childhood settings are the optimal environments for early intervention with children with DD as they provide structured learning activities and experiences (Guralnick, 2005; Peisner-Feinberg, 2007) which significantly affect their brain development and their future learning (Guralnick, 2001; Norwich, 2008). Therefore, educators must be trained and supported to implement evidence-based practices promoting preventative approaches, for teaching children to develop age-appropriate social and communication skills.

Several studies have indicated that most educators in early childhood settings are unaware of which practices are evidence-based and provide guidance for monitoring their impact on children's performance, and which ones are not (Banko-Bal & Guler-Yildiz, 2021; Begeny & Martens, 2006; Burns & Ysseldyke, 2009; Japel et al., 2005; Maheady et al., 2013). Evidence-based practice in DD is defined as "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of [clients]" (Sackett et al., 1997, p. 2, as cited in Perry & Weiss, 2007, p. 167).

In North America, increasing emphasis is being placed on providing high-quality early childhood services, as government funding has been granted to early childhood programs to improve access for children and their families (Canada, 2022; Department of Education and Early Childhood Development, Government of Nova Scotia, n.d.; GRIT Program, 2023; Preschool Development Grant – Birth Through Five - Office of Elementary and Secondary Education, 2023). Indeed, children who attend high-quality early childhood settings have better long-term academic achievement, resulting in a lower need for special education services (Peisner-Feinberg et al., 2001). However, since the curriculum in these settings often focuses on academia (Bassok et al., 2016), less emphasis has been placed on children's social, emotional, and behavioural development.

Importantly, previous research has revealed the significance of addressing young children's

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[3] Although other terms are now being used in place of *challenging behaviour* (CB), we use CB in this paper because it has a specific meaning within the PM framework.

social-emotional development, as 10 to 20% of children aged 2 to 5 years present with social-emotional delays and CB (Brauner & Stephens, 2006; Egger & Angold, 2006). Preschool-aged children are three times more likely to be expelled than children in elementary and high schools (Gilliam, 2005). Young children who exhibit aggressive and anti-social behaviours have a higher likelihood of continuing in the same manner in future, thus resulting in school and social difficulties that impact their overall well-being (Brennan et al., 2012; Dodge et al., 2014; Jones et al., 2015). As a result, concern is growing regarding the need to promote young children's social, emotional, and behavioural development.

When educators focus on teaching young children social-emotional skills, they promote positive behaviours and reduce the likelihood of children engaging in CB. For example, when children can follow rules and routines, engage in positive social interactions, focus, and persistently engage in challenging tasks, they have more positive school experiences and are more likely to graduate from high school and find long-term employment (Bierman et al., 2018; Jones et al., 2015).

**The Nature of Early Childhood Settings in Quebec**

In the province of Quebec in Canada, there has been an increase in children with DD attending early childhood settings since the implementation of the policy on integrating children with DD into childcare establishments and the increase in subsidies for early childhood settings to support these children (Ministère de la Famille et des Aînés [MFA], 2017). Children aged 0 to 5 years can access full-time childcare services in early childhood centres or home-based settings (MFA, 2017). In addition, educators who work in these facilities must complete a 3-year college-level program, including classes in psychology, education, sociology, nutrition, health, and communication (MFA, 2017). However, the program does not include behaviour management or precise methods for teaching children with DD. Furthermore, no specific directive exists for the management of CB and the promotion of social skills in early childhood settings.

Specialized rehabilitation centres in Quebec report that educators working in early childhood settings often feel helpless due to insufficient training for managing CB (Rivard et al., 2015). Indeed, a study evaluating the quality of subsidized childcare centres in Quebec showed that educators do not provide adequate opportunities for children to learn to solve problems, work collaboratively, be autonomous, and make independent choices (Gingras et al., 2015). Overall, a support system that provides appropriate training and services must be provided for inclusion to be successful (Dunlap et al., 2013; Rafferty et al., 2003).

**Social-Emotional Learning in Early Childhood Settings**

A 2014 policy statement in the United States emphasized the importance of incorporating social-emotional learning into early childhood settings and provided guidance on the delivery of tiered interventions that foster children's social-emotional competence (U.S. Department of Health and Human Services & U.S. Department of Education, 2014). Through these interventions, students are assessed based on risk rather than deficit; thus, intervention is proactive rather than reactive.

There has been significant focus on tiered frameworks in the school system, with a lack of research concerning early childhood settings. Indeed, despite the evidence supporting tiered

frameworks, there are several important considerations in terms of their implementation within early childhood settings (Hemmeter & Conroy, 2018).

Firstly, young children are in the early stages of learning social-emotional competencies, and have not yet mastered expressing their emotions, taking turns, and solving problems. Therefore, it is common for them to display CB as they lack the necessary skills to engage in more appropriate behaviours. Based on this, educators' teaching practices should include approaches to support their social-emotional development (Hemmeter & Conroy, 2018).

Secondly, early childhood settings differ in terms of their structures and environments (Hemmeter & Conroy, 2018). For example, children can attend public schools, private, partially subsidized, or fully subsidized centre-based institutions, or home-based settings. These settings differ in terms of their type and amount of funding, staff qualifications, resources for educators, and day length. Indeed, such designs must consider the qualifications of the educators and the range of early childhood settings to provide effective intervention practices (Hemmeter & Conroy, 2018). As a result, the current study incorporated the use of an evidence-based intervention, the Pyramid Model (PM), for its implementation in early childhood settings. This model offers educators a framework to bridge the current gap in knowledge by providing them with resources and assistance for implementation. For example, resources include scripted social stories and visual supports to place in the classroom as well as infographics for educators and parents. These resources are widely available in English and some of the materials have been translated into French (e.g., the ASaP [Access, Support and Participation Program] administered by GRIT, 2023). In addition, video models, instruction manuals and online trainings are available to assist in the implementation (National Center for Pyramid Model Innovations, 2023; Preschool Training Modules for Early Childhood Development, 2021).

## The Pyramid Model to Promote Social-Emotional Competencies and Prevent Challenging Behaviours in Early Childhood Settings

An essential component of effective inclusion is the use of specialized interventions and supports, such as resources for professional development, ongoing coaching and collaboration, and time for communication and planning (Akalın et al., 2014; Gal et al., 2010).The PM is an evidence-based tiered intervention framework that aims to promote young children's social, emotional, and behavioural development in preschool settings (Fox et al., 2003, 2010; Hemmeter et al., 2006, 2013). The first tier of the PM specifies two key features of universal supportive practices: (a) nurturing and responsive relationships and (b) high-quality supportive classroom environments (Strain & Hemmeter, 1997). The second tier addresses the needs of children at risk of delays in social-emotional development. This tier focuses on targeted practices that teach social and emotional skills, including those that prevent or replace CB. The third tier focuses on personalizing the social, emotional, and behavioural support interventions for individual children with significant deficits in social or emotional skills and persistent CB (Fox, 2011). Positive behaviour supports (PBS) are implemented and individualized to each child. Indeed, PBS is an evidence-based method that includes the identification of the environmental events, circumstances, and interactions that trigger CB and the development of strategies for teaching new skills and preventing CB (Dunlap et al., 2013; Fox et al., 2002).

Several studies have been conducted to assess the efficacy of the PM model in Canada (Nova Scotia Early Childhood Development Intervention Services and Early Childhood Collaborative

Research Centre, 2020; The GRIT Program, 2023), the United States (Hemmeter et al., 2015, 2016, 2021; Steed & Roach, 2017), and worldwide (Lam & Wong, 2017; Rakap et al., 2018). In 2016, Hemmeter et al. conducted a randomized control trial to evaluate the implementation of the PM with 40 preschool educators and 494 children between the ages of 2 and 5 years. Twenty educators in the intervention group engaged in a workshop to support them to implement PM practices in their preschool classrooms. Children in the classrooms of teachers receiving this intervention were rated as having better social skills and fewer CBs relative to children in classrooms of teachers who did not receive this training. This study thus provided promising results regarding the efficacy of the PM in early childhood settings (Hemmeter et al., 2016).

However, for the PM to be implemented with fidelity, continuous training and support are required (Hemmeter et al., 2015). (The term *fidelity* refers to how closely programs apply curriculum content and processes as they are designed.) Several studies have examined the implementation of the Teaching Pyramid Observation Tool (TPOT), a measure indicating the number of PM practices implemented in a classroom, and they demonstrated that educators who did not receive training and support implemented less than 40% of the practices. Furthermore, educators were inconsistent in their application of the PM and their practices were not always associated with it (Artman, 2010; Hemmeter et al., 2010).

## Practice-Based Coaching

For evidence-based practices to be implemented effectively, educators must receive consistent professional development (Halle et al., 2013). One professional development method that has been shown to be effective is practice-based coaching (PBC). Coaching is a relationship-based process facilitated by an expert to increase a professional's competencies, skills, and behaviours (National Association for the Education of Young Children & National Association of Child Care Resource and Referral Agencies, 2012; Snyder et al., 2015). PBC often follows a PM training, during which the model is taught to a large group of people over a specific time period with the goal of transferring knowledge and teaching new information. It is a cyclical process, as it supports educators' use of effective teaching practices and, thus leads to positive outcomes for children (Snyder et al., 2015). Indeed, PBC is characterized by its focus on supporting the fidelity of educators' implementation of evidence-based teaching practices (Snyder et al., 2015). Studies have demonstrated that, when training was followed by PBC, improvements were observed in the fidelity of educators' implementation of teaching practices and in the child outcomes (Artman-Meeker et al., 2014; Bishop et al., 2015; Conroy et al., 2014, 2015; Fox et al., 2011; Hemmeter et al., 2015; Snyder et al., 2015). In PBC, the practices can be developed using measures designed to evaluate the fidelity of educators' implementation of these practices, such as the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) and the Teaching Pyramid Observation Tool (TPOT; Hemmeter et al., 2014). (In the present study, both measures are utilized to evaluate educators' practices.)

PBC involves a three-step process: 1) goal setting and action planning, 2) focused observation, and 3) reflection and feedback. Each component can be implemented through various coaching formats, including expert face-to-face coaching, expert web-based distance coaching, self-coaching with web-based support, and self-coaching with expert self-monitoring support. During the first step, data are collected regarding the educators' current practices (e.g., Inventory of Practices for Promoting Social-Emotional Competence [IPPSEC]) to determine which practices

they need to improve. Based on their identified needs, measurable and achievable goals can be created for educators to focus on. Action planning involves developing the procedure for how to achieve these goals, including five components: goal (e.g., I will teach children to identify three emotions in themselves and others); action steps (e.g., I will post pictures of the emotions on the wall); resources (e.g., I will download and laminate pictures of emotions from the National Center for Pyramid Model Innovations [NCPMI] website); timelines (e.g., I will have it completed in 7 days); and a goal achievement statement (e.g., I will provide descriptive praise to children who are identifying emotions) (Snyder et al., 2015).

In the next step, focused observation, information is collected regarding the goals and action steps to measure the fidelity of the implementation of the practices. The coach may provide additional support by providing modelling strategies, problem-solving situations, and further resources, such as videos, checklists, reading materials, and visual aids. The last step is reflection and feedback. During the reflection stage, the coach and the individual discuss the information collected during the observation to determine the improvements and modifications that should be made. The feedback is provided based on the educator's application of the strategies and action plan. Importantly, performance-based feedback has been demonstrated to improve the fidelity of the implementation of evidence-based practices (Artman-Meeker & Hemmeter, 2013; Barton et al., 2011; Fox et al., 2011; Hemmeter et al., 2011).

When the present study began, there was no specific evidence-based approach for the professional training for educators or unified methods for teaching children with social-emotional deficits and CB in early childhood settings in Quebec. Importantly, international evidence supported the effectiveness of the PM in early childhood settings (Hemmeter et al., 2015, 2016, 2021; Lam & Wong, 2017; Rakap et al., 2018; Steed & Roach, 2017). Furthermore, numerous studies have demonstrated the effectiveness of PBC (Artman-Meeker & Hemmeter, 2013; Fox et al., 2011; Hsieh et al., 2009; Scheeler et al., 2004). Therefore, the present study aimed to extend previous findings on PM and PBC and offer an evidence-based intervention for use in Quebec's early childhood settings. Additionally, this study was conducted in real-life settings, which included aspects that were not part of previous research, such as daily chores (e.g., preparing and serving snacks and meals, arranging the furniture for lunch and rest periods, changing diapers, assisting with toileting, and dressing), and administrative duties (submitting written observations about children, maintaining early childhood equipment, assisting with housekeeping, and cooking duties).

## Research Objectives

The current study is the second part of a larger project (the doctoral thesis of the first author: Rothstein, 2022). The first part of the project assessed educators' attitudes toward inclusion, their implementation of PM practices, and their evaluations of the social validity of the PM with 33 educators following two-day PM training (Rothstein & Rivard, 2023). The goal of the current study was to evaluate PM coaching of PM-trained educators working in inclusive early childhood settings in Quebec. This project aimed to extend the findings of Hemmeter et al. (2016) by applying the PM framework in real-life settings with college-level educators and including direct observations. The current study had three evaluation objectives: 1) the effects of coaching on educators' implementation of PM strategies; 2) the impact that the PM training with coaching has on the social skills and CB of children in the classroom; and 3) the social validity

of PM training with coaching. *(Social validity* refers to the social importance and acceptability of treatment goals, procedures, and outcomes.)

## Method

### Participants

This research project received ethical approval from the Université du Québec à Montréal's research ethics committee for projects involving humans (CERPE) in October 2018. The educators and the parents of the children participating in the project were required to sign a consent form. The present project was conducted between April 2019 and July 2019.

### *Educators*

Following the two-day training (National Center on Pyramid Model Innovations, 2023) that formed the first part of this project conducted in January 2019 and February 2019, the 33 educators were contacted by email and asked if they wanted to participate in the second part of the study involving the implementation of PBC. The inclusion criteria for educators to participate included: (a) having obtained a minimum of a college degree in early childhood education or a related field; (b) working in a subsidized centre-based program that integrates children with special needs and CB; (c) having classrooms divided into different age groups; (d) having attended two days of PM training conducted in English; (e) allowing the principal investigator to provide live coaching in the classroom settings; and (f) teaching children aged 2 to 5 years. Ten educators from three different early childhood settings agreed to participate and the coaching began two to three months following the training. One educator was granted preventative leave and withdrew from the study before the coaching was completed.  See Table 1 for sociodemographic information for the nine remaining educator participants.

## Table 1

*Sociodemographic Information of Educators*

|  | Number of Participants (N = 9) | Percentage |
|---|---|---|
| Age (years) |  |  |
| 18-25 | 0 | 0 |
| 26-35 | 0 | 0 |
| 36-45 | 3 | 33.3 |
| 46-55 | 5 | 55.6 |
| 56-65 | 1 | 11.1 |
| Total Years of Experience |  |  |
| 0-10 | 0 | 0 |
| 11-15 | 3 | 33.3 |
| 16-25 | 1 | 11.1 |
| 26-35 | 5 | 55.6 |
| Ethnicity |  |  |
| Caucasian | 4 | 44.4 |
| African American | 2 | 22.2 |
| Native American | 2 | 22.2 |

| | | |
|---|---|---|
| Middle Eastern | 1 | 11.1 |
| Highest Level of Education | | |
| High School | 0 | 0 |
| CÉGEP[1] | 8 | 88.9 |
| Bachelor's Degree | 1 | 11.1 |
| Annual Income[2] | | |
| $10,000-29,999 | 0 | 0 |
| $30,000-49,999 | 6 | 66.7 |
| $50,000-69,999 | 2 | 22.2 |
| Prefer not to answer | 1 | 11.1 |

Note. [1]In Québec, CÉGEP provides postsecondary education in preparation for college studies or vocational training in preparation for a trade. [2] Incomes are reported in Canadian dollars (CAD).

### Children

Ten children participated in the study. The inclusion criteria included: (a) being aged 2 to 5 years; (b) being identified by the educators as having an elevated risk for CB; or (c) having a diagnosis of ASD, GDD or another DD. Each participating educator chose a child in their class that presented with the above-mentioned criteria.

## Measures

This section explains the measures that were selected based on the objectives of the study, the target population and consideration of which instruments have been previously used in similar research projects. All the measures were provided in English.

### Educator Data Collection Tools

**Inventory of Practices for Promoting Social-Emotional Competence (IPPSEC).** This tool was designed to be used by educators or staff teams to identify training needs in specific areas of the PM (Center on the Social and Emotional Foundations for Early Learning [CSEFEL], 2006). These areas include: (a) building positive relationships, (b) creating supportive environments, (c) social-emotional teaching strategies, and (d) individualized intensive interventions. The use of the inventory encourages self-reflection, as well as collaboration and discussion between the team members and coaches. Each of the four areas includes several skills and indicators related to practices that promote young children's social-emotional competence. There are three levels of skill performance: *consistently*, *occasionally*, and *seldom*. Finally, the last column allows the educator to indicate which skills they should target.

**Teaching Pyramid Observation Tool (TPOT).** The objective of the TPOT was to assess the fidelity of implementation of intervention during baseline and treatment conditions (Fox et al., 2011) and to evaluate the correlation between the fidelity of intervention and child outcomes (Hemmeter et al., 2011; Snyder et al., 2013). The TPOT includes 2-hour observations during teacher-directed activities, child-directed activities, and transitions from one activity to the other, in the classroom setting. Additionally, a 15-to-20-minute structured interview is

conducted with the teacher, which includes questions regarding key practices, red flags, and environmental arrangements. The TPOT has 108 indicators that are scored either as *Yes* (when the educator is observed or reported to have implemented the practice) or *No* (when the practice was not observed or was reported to not have occurred).

**Classroom Assessment Scoring System (CLASS)**. This tool is an observational, judgment-based rating scale designed to assess classroom quality; it focuses on the interactions and curricular materials used in preschool to third-grade classrooms (Pianta et al., 2008). The CLASS includes four cycles of 15-minute observations, comprising of ten dimensions linked to student achievement, and is organized based on three domains: (a) emotional support, (b) classroom organization, and (c) instructional support. Scores for the dimensions and domains on the CLASS range from 1 (*low*) to 7 (*high*).

*Child Outcome Measures*

**Social Skills Improvement System (SSIS).** This tool is a teacher-reported scale that measures children's social skills and problem behaviours in the classroom (Gresham & Elliott, 2008). In the current study, the educators of each target child completed a teacher version of the SSIS to measure the children's social skills and problem behaviours observed in the classroom which consisted of 76 items, with 46 items for social skills and 30 items for problem behaviours.

In addition, the parents of the target children completed a parent version of the SSIS to measure their social skills and problem behaviours observed at home. The parent version consisted of 79 items, with 46 for social skills and 33 for problem behaviours.

**Observational Data for Educators and Children.** The principal author chose one key practice (KP) and one red flag (RF) for each educator based on the information gathered from the TPOT. Data were collected daily on each of the educator's target behaviours.

Each educator identified one child in their classroom who displayed CB or had a DD. Following this, one positive social behaviour (PSB) and one CB were chosen as the behavioural targets for each child based on the information gathered from the SSIS.

An observation grid was developed to record the target behaviours of the participating educators and children. The data measured the target behaviours of the educator and children and evaluated the impact that the coaching sessions provided to the educators had on these behaviours. Each child and educator were observed for two 5-minute intervals, separated by a delay, during structured and unstructured activities, transitions, and specific times that had been reported as challenging by the educators. For each of the two 5-minute intervals, there was a total of 10 intervals of 30 seconds each (20 intervals in total per day).

All target behaviours were measured using partial interval recording (Cooper et al., 2007). Each behaviour was scored as either *occurring (Y)* or *not occurring (N)* during the 30-second intervals. The percentage of intervals when the behaviours occurred was calculated by dividing the number of intervals in which the behaviour occurred by the total number of intervals.

**Treatment Acceptability Rating Form - Revised (TARF-R)**. This tool was used to measure the acceptability of the intervention (Reimers et al, 1991). Specifically, it assessed the educator's acceptance of the PM for use in the classroom. The TARF-R contains 20 questions, with 17 questions relating to intervention acceptability and other questions relating to problem severity understanding of the intervention and the effectiveness and cost of the intervention. The responses to the questions were rated on a 5-point Likert-type scale (1 = *not at all clear, not at all acceptable*, 5 = *very clear, very acceptable*). Total scores were obtained by summing all the items, with higher total scores representing higher levels of acceptability.
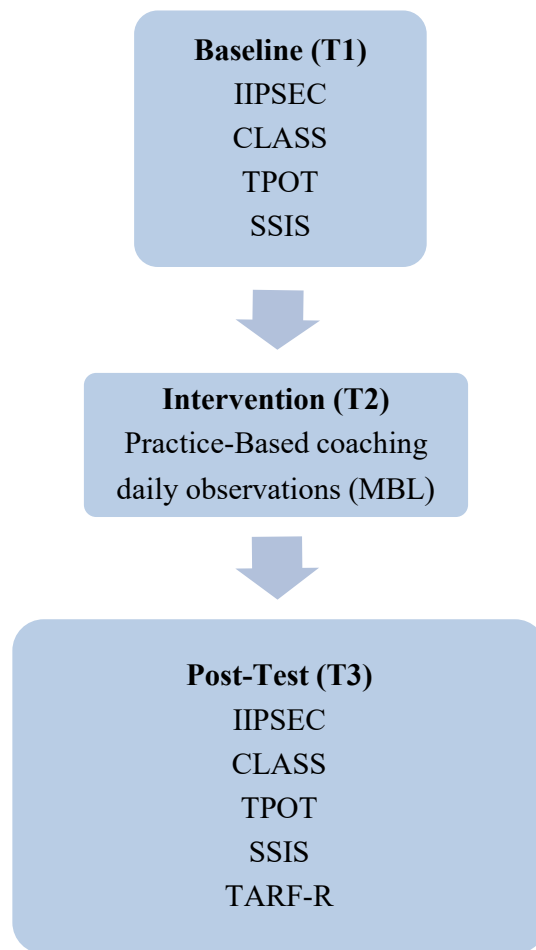
## Procedure

### Design

A mixed-method design was used to assess the effects of PM implementation on the educators' practices, as well as the intervention's feasibility and acceptability. The study included quantitative and qualitative data. Quantitative data were used to measure: 1) the effects of coaching on educators' implementation of PM strategies; 2) the impact that the PM training with coaching has on the social skills and CB of children in the classroom; and 3) the social validity of PM training with coaching. The measurements of the quantitative data were taken at baseline (T1), and once the coaching sessions were completed (T3). Qualitative data were used to measure the social validity, feasibility, and acceptability of the intervention (T3). Quantitative and qualitative data were combined to assess the social validity and feasibility of the intervention for the purposes of breadth and depth of understanding and corroboration (Johnson et al., 2007).

A concurrent multiple baseline design (MBL) across participants was used to implement coaching for educators within each of three early childhood settings and applied to several educators simultaneously (Christ, 2007; Slocum et al., 2022). Concurrent multiple baseline designs are time efficient as all participants can receive the intervention at the same time. In addition, it is advantageous because it controls for threats to internal validity, such as history effects, where an event, other than the independent variable, may impact the results of the experiment (Slocum et al., 2022). Within each setting, the baselines were staggered with each participant beginning intervention at separate times. Coaching was provided to each educator in a synchronized manner.

### Baseline: Time 1 (T1)

Prior to the implementation of the intervention, each educator was observed teaching in their classroom and scored using the CLASS measure and the TPOT, to evaluate the effects of the two-day group training on the implementation of the PM strategies. Following the observations, a brief 15-minute interview included in the TPOT was conducted. Each educator completed the SSIS for a target child in their classroom to evaluate the impact of the intervention on the specific child. Parents of the target children were also asked to complete the parent version of SSIS to assess the effect of the intervention on their children's behaviours at home. Once the information was gathered from the TPOT and the SSIS, the target behaviours for each educator and child were chosen and daily observations began in the classroom. Additionally, the educators completed the IPPSEC following the completion of the training.

**Figure 1**

*Flow Chart of the Procedure*



**Baseline (T1)**
IIPSEC
CLASS
TPOT
SSIS

**Intervention (T2)**
Practice-Based coaching
daily observations (MBL)

**Post-Test (T3)**
IIPSEC
CLASS
TPOT
SSIS
TARF-R

*Note. T1 is baseline and includes the measures taken prior to the intervention. T2 is the implementation of the intervention, practice-based coaching. During this time, data from daily observations were collected and are represented in a multiple baseline design. T3 is the post-test and includes the measures that were taken at the completion of the intervention.*

### Intervention: Practice-Based Coaching: Time 2 (T2)

Following baseline, educators received individualized coaching based on the three main components of PBC: planning goals and action steps, engaging in focused observation, and reflecting on and sharing feedback about teaching practices. The coaching sessions were individualized, lasted 30 minutes each, and were conducted weekly for eight sessions. For the sessions, the coach and the educator met in a quiet room in the early childhood setting and collaborated to create a goal to implement in the classroom. These goals were created based on information gathered from the observations conducted in the classroom (TPOT, CLASS) regarding the educators' implementation of PM practices. During this process, the coach suggested goals that could be targeted based on the observations, and the educators chose the ones they would like to target for the week. Jointly, the coach and educator wrote the goal in observable and measurable terms and determined the steps to achieve the goals, the required

resources, and a date by which they would complete it. Each goal had an achievement criterion, which was formulated based on the classroom's needs and the feasibility of reaching the goal within the timeframe. A typical example of an educator's goal was, "I will teach behavioural expectations until I achieve a criterion of 80% over two consecutive days." The steps to achieve this goal were to visually post behavioural expectations during circle time, post visuals of the daily schedule, and place visuals of footprints on the floor to indicate where the children should stand when lining up. Following the identification of the steps, the resources, such as visuals, were provided to the educator, and a date was determined for when the goal should be achieved. The following week, the coach and educator reviewed the goal, feedback was provided, and they decided whether to continue with the same goal or to commence another one.

### Post-Intervention Data Collection: Time 3 (T3)

After completion of the coaching sessions, all measurements were repeated (IPPSEC, CLASS, TPOT, SSIS). The TARF-R was also administered to measure the social validity of the intervention.

### Inter-Observer Agreement for Observations

Inter-observer agreement was collected for the observations of the educators (KP, RF) and children's behaviours (PSB, CB). Two research assistants were assigned to collect data at each of the three early childhood settings, and all the research assistants and the principal investigator met before data collection in the classroom to ensure consistency. During this session, videos of educators and children in a classroom were examined, and each assistant practiced recording data on specific behaviours using the datasheets. The inter-observer agreement was measured by calculating the total number of agreements divided by the total number of agreements plus disagreements (Cooper et al., 2007). This process was repeated until there was 100% consistency among the group. During the first week of data collection, the principal investigator attended each early childhood setting to assess inter-observer agreement with the research assistants. Two weeks later, the principal researcher met with each research assistant team to review the datasheets and address any issues with data collection that they were experiencing.

### Data Collection

To analyze the effects of coaching on educators' implementation of PM strategies, a Matched-Pairs t-test was used to compare educator's TPOT, CLASS and IPPSEC scores at T1 and T3. To evaluate the impact that the PM training had on children's social skills and challenging behaviours, a Matched-Pairs t-test was used to compare the children's SSIS scores at T1 and T3. For social validity, a Matched Pairs t-Test was used to evaluate educator's responses on the TARF-R at T3. Daily observations conducted on the educator's and children's target behaviours was analyzed using conservative dual criterion method (CDC; Fisher et al., 2003; Swoboda et al., 2010) and randomization test (Bulté & Onghena, 2009).

## *Data Analyses*

Statistical analyses were performed using SPSS statistical software version 26. P values =/< .05 were statistically significant.

To analyze the individual results based on each educator's and child's multiple baseline data, a conservative dual criterion method (CDC; Fisher et al., 2003; Swoboda et al., 2010) was utilized. The CDC method calculates the mean line based on the baseline data and then superimposes it onto the subsequent data path. An effect size is demonstrated when a specific number of data points fall above each of the lines according to an equation (Stewart et al., 2007). The CDC analyses were performed using SSDforR v1.5.20 software (Zeitlin & Auerbach, 2019).

A randomization test (Bulté & Onghena, 2009) was conducted to globally analyze the multiple baselines for all the educators in each early childhood setting. Randomization tests compute the distribution of the test statistic under the null hypothesis by calculating all observed data point permutations (Bulté & Onghena, 2009). Data analyses for the randomization tests were conducted using Rv3.5.3 software (R Core Team, 2018).

## Results

Results are presented in the following order based on the study's three specific objectives, namely evaluation of: 1) the effects of coaching on educators' implementation of PM strategies; 2) the impact that the PM training with coaching has on the social skills and CB of children in the classroom; and 3) the social validity of PM training with coaching. All results obtained from the measures are included and summarized in Tables 2 to 7. The various data collection tools assessing the impact of PM training with coaching demonstrated significant increases in the implementation of PM practices and the positive target behaviours of educators and children.

The results obtained on the daily observations (multiple baseline design) on the target behaviours of the educators and children are summarized below and are included in Figures 2 to 7. To assist with readability, these tables and figures are in the Appendix section. In the figures representing the educator's practices, the Y axis refers to the percentage of key practices and red flags educators implemented in their classrooms during a specific time interval. During coaching sessions, the coach met with the educator and provided feedback on the key practices being implemented. Outcome changed indicates when the targeted key practice was changed for the educator as they met mastery criteria. In the figures representing the children's behaviours, the Y axis refers to the percentage of prosocial behaviours and challenging behaviors for each child during a specific time interval. Outcome changed indicates that the child met mastery criteria for their prosocial behaviour, and the target behaviour was changed.

### Effects of Coaching on Educators' Implementation of PM Strategies

Firstly, to evaluate the educators' perceptions of the implementation of PM practices, data from the IPPSEC were analyzed using a matched-samples *t*-test. The mean post-test IPPSEC scores

($M = 2.82$, $SD = 0.14$) were higher than mean pre-test scores ($M = 2.57$, $SD = 0.36$), although this pattern did not reach significance, $t(9) = -1.99$, $p = .08$ (results for individual educators not shown).

Secondly, the TPOT was analyzed using a matched-samples $t$-test to assess the educators' implementation of PM practices. The mean post-test TPOT scores ($M = 93.57$, $SD = 5.62$) were significantly higher than mean pre-test scores ($M = 72.07$, $SD = 9.24$), $t(6) = -13.44$, $p < .001$ (see Table 2, meaning educators implemented more PM strategies following the intervention).

Thirdly, the CLASS measure data were analyzed using a matched-samples $t$-test to investigate the effect of coaching on the quality of educator-child relationships and classroom organization. The mean post-test CLASS scores ($M = 53.57$, $SD = 3.04$) were significantly higher than mean pre-test scores ($M = 43.57$, $SD = 6.02$), $t(6) = -4.58$, $p < .001$, suggesting the classroom quality was higher following the intervention (see Table 2, Appendix).

## Impact of PM Training with Coaching on Child Outcomes

Finally, to assess the impact of the intervention on the children's behaviours, data from the SSIS were divided into two sections, including social behaviours and problem behaviours, and analyzed separately (see Table 3). Regarding children's social behaviours, the mean SSIS scores, as measured by educators at post-test ($M = 77.44$, $SD = 27.99$), were significantly higher than at pre-test ($M = 62.67$, $SD = 30.19$), $t(8) = -2.40$, $p = .04$ (see Table 3, Appendix), meaning children's social behaviours improved following the intervention. However, regarding children's CB, the mean SSIS scores at post-test ($M = 24.67$, $SD = 12.86$) were similar to the scores at pre-test ($M = 24.33$, $SD = 13.23$), $t(8)= -0.97$, $p = .93$. In terms of the parent measure, for social behaviours, the mean SSIS scores at post-test ($M = 2.02$, $SD = 0.51$) were slightly higher than at pre-test ($M = 1.93$, $SD = 0.45$), $t(7) = -8.86$, $p =.41$. For the children's CB, the mean SSIS scores at post-test ($M = 0.60$, $SD = 0.26$) were slightly lower than at pre-test ($M = 0.71$, $SD = 0.26$), $t(7) = 1.05$, $p =.33$. However, neither of these results from the parent reports reached significance.

## Social Validity

The social validity of the training was measured using the TARF-R. The TARF-R results indicated that all nine educators who completed the coaching sessions considered the PM a feasible intervention for implementation ($M = 3.29$, $SD = 0.27$, range = 1.3–4.9; see Table 4, Appendix). As part of the TARF-R, educators were asked for both their suggestions for improvements and any additional comments regarding the content and format of the coaching, and these are reported in Table 5, Appendix.

## Multiple Baseline Design

For each early childhood setting, the results of the daily observations conducted with the educators and children were presented visually, along with a description of the context and the most salient results. Regarding data analyses using the CDC method, Tables 6 and 7 (Appendix) describe the number of sessions required to achieve each of the children and educators' target behaviours, respectively.

### *Early Childhood Setting 1*

In this setting, educators worked in teams of two in each class. Therefore, during the observations, there were always two educators present in the classrooms. Every day, observations were collected on each educator separately for two 5-minute intervals. Coaching sessions were conducted with both educators (see Figure 2, Appendix). Additionally, in each classroom, each educator chose one child who engaged in CB, meaning that two children per classroom were observed daily. As with the educators, the observations were conducted on each child separately for two 5-minute intervals per day (see Figure 3, Appendix).

### *Early Childhood Setting 2*

In this setting, the educators also worked in teams of two. However, the observations were conducted with one educator in each classroom, as only that educator had participated in the initial PM training. The intervention began with three educators and three target children. However, one educator had to withdraw her participation as she went on preventative leave (see Figure 4). Despite this, observations continued to be conducted with all three participating children (see Figure 5).

### *Early Childhood Setting 3*

As with the previous settings, the educators worked in teams of two (educators 7-9). However, the observations were conducted with one educator in each classroom, as only that educator had participated in the training (see Figure 6, Appendix). Within each classroom, one child who engaged in CB was observed daily (children 8 to 10, see Figure 7, Appendix).

It is important to note that, for this setting, there was a long baseline until the intervention could begin in late May. Indeed, the intervention began three weeks before summer when the educators left for several weeks for vacation, thus there were many changes in the daily schedules and routines. These vacations impacted the timeline for this project. Additionally, the research assistants who were employed to collect daily observations had to stop collecting data before the coaching sessions were completed due to prior commitments. However, the coaching sessions continued until all the educators had received the total eight sessions.

### CDC and Randomization Results

The results obtained from conducting the CDC method demonstrated that, in early childhood setting 3, child 9 improved significantly in both PSB and CB. No other CDC test results were statistically significant (see Table 7, Appendix).

The randomization test revealed that the RFs decreased significantly for both the educators in early childhood setting 2 ($p = .001$). For the children in early childhood setting 3, the randomization test revealed that all their PSBs increased significantly ($p = .010$).

## Discussion

In Quebec, the Canadian province where this study was conducted, there are a limited number of empirically based approaches for teaching young children with social-emotional difficulties and CB in early childhood settings. The present study evaluated the effects of coaching on the implementation of PM practices with nine educators working in three different early childhood settings. In addition, the impact of PM with coaching on the social skills and CB of ten children in these settings was assessed. To complement the assessment of the PM's implementation, its social validity was also explored. The present study aimed to extend previous findings regarding the PM (Hemmeter et al., 2016) by implementing this empirically based intervention with educators working in subsidized daycares in Montreal, Quebec.

The first objective of this study was to evaluate the effects of coaching on educators' implementation of PM strategies. The TPOT and CLASS measures were administered to evaluate the effects of training and coaching on the educators' implementation of PM practices and interactions with children. The results from both measures were statistically significant, demonstrating that educators improved their practices following training and coaching. These results are promising as they suggest that educators can enhance their skills and apply them in the classroom when evidence-based professional training is combined with continued support. Most educators working in early childhood settings in the province of Quebec are only required to obtain a college-level degree in early childhood education, which often does not include courses focusing on special education or behaviour management. Despite this, all educators in early childhood settings in this study were able to implement the PM strategies successfully. These results are promising as they suggest that educators with less extensive training (e.g., university degrees and training in special needs; Hemmeter et al., 2016) can enhance their skills and apply them in the classroom when evidence-based professional training is combined with continued support.

The second objective evaluated the impact that the PM training with coaching has on the social skills and CB of children in the classroom. In the current study, the children were observed for two 5-minute intervals every morning during several activities and transitions to capture their engagement in as many interactions as possible. These observations allowed us to examine the frequency, level, and trends in the children's engagement in CB. Furthermore, daily observations were conducted regarding the educators' behaviours, which enabled the evaluation of the educators' real-life classroom practices in a naturalistic setting. Interestingly, as noted on the multiple baseline graphs (Figures 2-7), the educators increased their implementation of the practices before the coaching sessions. Following the coaching sessions, their targeted behaviours decreased for a few days prior to the subsequent coaching session. The educators' implementation of practices followed a similar behaviour pattern to those exhibited with fixed-interval schedules of reinforcement. This type of reinforcement schedule may cause high amounts of responses near the end of the interval but slower responses immediately after the delivery of the reinforcer (Cooper et al., 2007). Therefore, this behavioural response is expected as it occurs with fixed-interval schedules of reinforcement, which are representative of reinforcement patterns in real life.

Specifically, when analyzing the daily observations of each educators' specific target behaviours, only the educators in early childhood setting 2 showed significant decreases in their RFs. However, although the data analyses did not reveal any other statistically significant changes in

the educators' target behaviours, small changes in their practices may be significant for children in the classroom environment, as demonstrated by the results of the TPOT and CLASS measures. It is also important to note that the RFs improved when they were directly related to the educator's target KP. For example, when the educator's target KP was to discuss emotions in the classroom, the RF of never discussing emotions decreased. Therefore, when creating goals for educators, it may be beneficial to ensure that both the KP practices to increase and the RF practices to decrease are linked. Indeed, when creating high-quality environments for children with learning and behavioural challenges, one method does not fit all individuals. Similarly, educators often require a more intensive and individualized approach to their professional development (Conroy et al., 2014) to acquire the skills to implement individualized intervention plans for children with more severe and complex CB in their classrooms (Hemmeter et al., 2006).

In this study, both the educators and parents of the target children completed the SSIS measure to assess the children's progress in both the classroom and home environments. In previous research, only the educators evaluated the children's social skills and CB using the SSIS (Hemmeter et al., 2016). For the educator measure, the results revealed statistically significant improvements in children's social skills. This highlights the importance of ensuring that educators develop highly supportive environments when implementing the PM so that children obtain social skills. Indeed, by focusing on developing nurturing relationships and teaching social-emotional competencies, children can engage in more PSBs. However, the results were not significant in terms of the CB, suggesting that, even with the effective implementation of tier 1 and tier 2 supports, some children still require more individualized support and interventions that target their CB. These findings are consistent with previous research stating that some children still require more intensive support despite the PM's lower levels being implemented (Benedict et al., 2007; Crone et al., 2015; Sugai et al., 2002). It is interesting to point out that when analyzing the observational data collected on the children's behaviours, only child 7 demonstrated a marked decrease in CB. This is likely due to the change in his KP as, once he was able to express himself vocally with gestures, he exhibited less withdrawal from his peers. Secondly, this child attended the classroom where the educator went on preventative leave. The replacement educator may have utilized different methods to integrate him into the classroom and manage his CB, which, in turn, had a positive impact on his behaviour.

For the SSIS parent measure, the results indicated that, overall, parents noticed only slight improvements in their children's social skills and CB when the educators implemented the interventions. This suggests that, despite behavioural improvements being observed in the classroom, these were not generalized to the home setting. However, it is worth noting that the target behaviours were specific to the behavioural expectations of the classroom environment and, thus, may not have been applicable to the home. Additionally, children with DD often have difficulty generalizing skills from one setting to another (Falligant & Pence, 2017; Matson et al., 2009). For this study, parents in the participating classrooms were sent resources and information about the PM via e-mail, but this was not sufficient to impact the children's behaviour at home. Some promising research has demonstrated the effectiveness of training parents on implementing positive behaviour supports in the home setting (Abouzeid et al., 2020; Rivard et al., 2021). Therefore, future research should provide parents with training and resources to enable them to apply similar strategies, thus supporting the generalization of skills across environments.

The final objective of this study focused on the social validity of the training and coaching in the classroom. In general, the educators were highly satisfied with the intervention, found it very acceptable and effective, and were highly willing to implement the strategies. They reported that the intervention had a positive impact on their classrooms. Specifically, the intervention provided them with clear expectations, and they spent more quality time interacting with the children. These findings are encouraging for the continued application of the PM model. Moreover, the results of the IPPSEC, which evaluated educators' perceptions of their implementation of PM strategies, suggest that the educators' perception of their improved practices may reinforce their practice-related behaviours and enhance their motivation to utilize the PM.

## Limitations

This study was part of a larger thesis research project (Rothstein, 2022) and has some limitations that should be addressed in future research. Regarding implementing PBC, observations are often conducted in the classrooms by the coach prior to the sessions to give immediate feedback to the educators. However, as there was only one coach, this was impossible to accommodate due to time constraints and several early childhood settings participating simultaneously with different schedules. The coaching sessions were performed individually in a separate meeting and therefore not live, and feedback was not delivered immediately in the classroom. Since this study was conducted in real-life settings, there were many scheduling constraints that impacted the time frame of implementation. Therefore, even though the interventions were staggered for each daycare, it was not possible to follow implementation schedule as planned.

Furthermore, there was no second coder for 30% of the observations when assessing the inter-observer agreements. Observations were completed in early childhood settings classrooms, for which having extra individuals in the room increases the risk of reactivity of all the participants in the classroom. In addition, it would have been difficult to obtain consent from all parents of the children in the participating classrooms to video record the observations. Nonetheless, the research assistants were all well-trained before collecting data and were supported throughout the intervention. Finally, it is important to note that the educators voluntarily agreed to participate in this study. Therefore, it is likely that these educators were more motivated to implement the strategies than the general population of educators. This may impact the generalizability of the findings when implemented with other educators.

## Future Directions

This study's findings highlight some important recommendations for future implementation. The initial PM training should be extended to three days and be provided to all educators working in each early childhood setting before the school year begins, as recommended in previous literature (Hemmeter et al., 2016; Pyramid Model Consortium, 2021). Training all educators at the same time would ensure a uniform approach within the setting and allow the educators to support each other with implementing the practices. Additionally, providing the training before the school year would enable educators to prepare the necessary resources and organize their classrooms accordingly. Indeed, in this study, two early childhood settings had already implemented some visual supports and practices in their classrooms before the coaching stage

began, which proved beneficial as they progressed more rapidly and implemented more classroom strategies.

In addition to extending the initial training, the coaching sessions should be extended to a minimum of 12 weeks, as was conducted in previous studies (Hemmeter et al., 2016; Snyder et al., 2015), to allow the educators more time to master the PM strategies. Furthermore, coaching sessions should include tier 3 interventions for children with CB who do not respond to the applied PM classroom strategies (Benedict et al., 2007; Crone et al., 2015; Hemmeter et al., 2007; Stormont et al., 2005). Upon completion of the coaching sessions, monthly follow-up sessions should be conducted to ensure maintenance of the skills and provide the educators with continued support.

## Conclusion

In Quebec, the Ministère de la Famille et des Aînés (MFA, 2020) is responsible for ensuring the quality of educational services offered to young children from birth to 5 years old. Over the past decade, early childhood settings in Quebec have undergone many changes: a substantial increase in the number of subsidized places; the publication of a survey identifying the strengths and weaknesses of the system and providing recommendations for improvement and regulation of the Educational Childcare Act (Gingras et al., 2015). However, there continues to be a lack of evidence-based training or unified methods for teaching children with social-emotional deficits in Quebec's early childhood settings.

Most recently, the MFA (2020) mandated that early childhood settings must participate in an evaluation procedure to improve the quality of education in these settings. The goal is that all children in early childhood settings receive a high-quality education that promotes their development and helps them to reach their potential. The evaluation involves the administration of the CLASS measure in all early childhood settings across Quebec. In conjunction with the results of this project, these government policy changes are encouraging in terms of reforming the current situation in early childhood settings in Quebec.

The provincial government initiatives may enhance the daily experiences of educators and young children in early childhood settings. However, for these settings to utilize high-quality, evidence-based practices with the children, educators need continued professional development. This study demonstrated that evidence-based professional development can provide positive outcomes for educators and children. The implementation of the PM within these settings allowed educators to gain more knowledge and expertise in evidence-based practices, as well as offered them consistent support in the form of coaching. As a result, educators were able to promote the social-emotional competencies and prevent CB in young children, thus improving both their short-term and long-term outcomes (Bierman et al. 2018; Jones et al., 2015).

**Key Messages from this Article**

**People with Disabilities:** You deserve to have educators understand your needs and be equipped with the necessary tools to support your inclusion in educational settings.

**Professionals:** It is essential to acquire knowledge and support in implementing evidence-based practices to promote preventative approaches to CB, as well as to utilize strategies for teaching children to communicate effectively and develop age-appropriate social skills.

**Policymakers:** Educators need continuous training and support to provide young children with DD with high quality education, allowing them to reach their potential.

**Messages clés de cet article**

**Les personnes handicapées** : Vous méritez que les éducateurs comprennent vos besoins et disposent des outils nécessaires pour favoriser votre intégration dans les établissements d'enseignement.

**Les professionnels** : Il est essentiel d'acquérir des connaissances et un soutien dans la mise en œuvre de pratiques fondées sur des données probantes afin de promouvoir des approches préventives dans la gestion des comportements socio-émotionnels problématiques, ainsi que dans l'utilisation des stratégies pour enseigner aux enfants à communiquer efficacement et à développer des compétences sociales adaptées à leur âge.

**Les décideurs politiques** : Les éducateurs ont besoin d'une formation et d'un soutien continu pour offrir aux jeunes enfants ayant des retards ou des atypies développementales une éducation de qualité et qui leur permettra de réaliser leur potentiel.

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# Appendix

## Table 2

*Educator's Implementation of Practices*

| | CLASS | | TPOT | | | |
| | Sum of Scores | | Pre-Test (%) | | Post-Test (%) | |
| Educator | Pre-test | Post-Test | Key Practices | Red Flags | Key Practices | Red Flags |
|---|---|---|---|---|---|---|
| 1 | 37 | 50 | 77 | 6 | 94 | 0 |
| 2 and 3 | 38 | 50 | 67 | 6 | 93 | 6 |
| 4 and 5 | 41 | 54 | 82 | 0 | 100 | 0 |
| 6 | 52 | 56 | 76 | 0 | 95 | 0 |
| 7 | 40 | 59 | 78 | 0 | 97 | 0 |
| 8 | 47 | 51 | 54.5 | 0 | 82 | 0 |
| 9 | 50 | 55 | 70 | 0 | 94 | 0 |

## Table 3

*Children's Sum of Scores on Parent and Educator Version of SSIS*

| Parent SSIS | Age | Pre-Test | | Post-Test | |
| | | Social Skills | Challenging Behaviours | Social Skills | Challenging Behaviours |
|---|---|---|---|---|---|
| 1 | 4 | 119 | 15 | 117 | 16 |
| 2 | 4 | 85 | 18 | 99 | 13 |
| 3 | 3 | 92 | 15 | $x^1$ | $x^1$ |
| 4 | 4 | 88 | 21 | 116 | 34 |
| 5 | 4 | 108 | 21 | 107 | 6 |
| 6 | 4 | 92 | 28 | 105 | 21 |
| 7 | 3 | 53 | 32 | 52 | 20 |
| 8 | 5 | 93 | 12 | 74 | 21 |
| 9 | 4 | 69 | 35 | 72 | 27 |
| 10 | 4 | | | 92 | 18 |

| Educator SSIS | Age | Pre-Test | | Post-Test | |
| | | Social Skills | Challenging Behaviours | Social Skills | Challenging Behaviours |
|---|---|---|---|---|---|
| 1 | 4 | 106 | 12 | 97 | 9 |
| 2 | 4 | 67 | 35 | 72 | 30 |
| 3 | 3 | 87 | 16 | 115 | 18 |
| 4 | 4 | 77 | 32 | 105 | 35 |
| 5 | 4 | 53 | 19 | 97 | 12 |
| 6 | 4 | 43 | 19 | $x^1$ | $x^1$ |

*Note. [1]Missing data*

| | | | | | |
|---|---|---|---|---|---|
| 7 | 3 | 90 | 6 | 76 | 29 |
| 8 | 5 | 23 | 45 | 37 | 50 |
| 9 | 4 | 38 | 17 | 54 | 16 |
| 10 | 4 | 23 | 37 | 44 | 23 |

## Table 4

*Educators Ratings on the Treatment Acceptability Rating Form-Revised*

| | Item | Mean | SD |
|---|---|---|---|
| Affordability | How affordable is this treatment for your organization? | 4.1 | 1.1 |
| | How expensive will it be to put this treatment in place? | 2.6 | 0.9 |
| Disruption/Time | How long will it take each day for you to put this treatment in place? | 2.3 | 1.0 |
| | How disruptive will applying this treatment be to your classroom? | 1.3[1] | 0.6 |
| Effectiveness | How likely do you think this intervention will lead to permanent improvements in your student's behaviours? | 4.9 | 0.3 |
| | How likely do you think that the treatment will be effective for your students? | 4.9 | 0.3 |
| | How confident are you that this treatment will be effective? | 4.7 | 0.6 |
| Reasonableness | How much do you like the strategies used in the proposed treatment? | 4.9 | 0.3 |
| | How well does this treatment fit into your classroom routine? | 4.9 | 0.3 |
| | Given the CB of your student, do you find this a reasonable treatment? | 4.8 | 0.4 |
| | How acceptable did you find this intervention for the students in your classroom? | 4.7 | 0.7 |
| Side effects | How likely is your student to experience discomfort during this treatment? | 1.6[1] | 1.1 |
| | How likely is it that adverse side effects result from this treatment? | 1.5[1] | 1.0 |
| | How likely do you think there might be disadvantages to implementing this treatment? | 1.3[1] | 0.9 |
| | Given the CB of your student, do you find this a reasonable treatment? | 4.8 | 0.4 |
| Willingness | How ready are you to change your routine to implement this treatment? | 4.8 | 0.4 |
| | How clear is your understanding of this intervention? | 4.6 | 0.7 |
| | How ready are your co-workers to help you put in place the proposed treatment? | 4.1 | 1.1 |

*Note. Ratings ranged from unsatisfactory/poor (1 = "not at all clear", "not at all acceptable") to highly satisfactory/excellent (5 = "very clear", "very acceptable") experiences. [1]Reverse coded item*

**Table 5**

*Themes Identified from Educators Responses on the TAR-F*

| Themes | Subthemes | *n* | Educator's Comments |
|---|---|---|---|
| Improvement to the content | Additional materials | 2 | "Would have liked more materials as the workshop was ending, such as a starter kit with visuals." |
| | Universal Training | 3 | "(….) all the staff members should receive the same training." |
| | Effective | 3 | "This program was an asset to our already hands-on approach to learning with young children. Our coaching step by step goals and strategies to achieve these goals were monitored and provided additional training when needed". |
| Improvement to the format | Longer training | 2 | "A 3-4-day workshop would have been great to fully explore all the materials in greater depth". |
| | Additional coaching | 3 | "(…) more time to meet to discuss strategies, implementation." |
| Appreciation | Positive impact | 4 | "It has impacted me a lot. I use the pyramid techniques all through the day, and it has been beneficial within the routine with the children." |
| | Providing clear expectations | 2 | "If a child does something unexpected, then it is not assumed that the child knows but rather that we must be sure that we have stated our expectations clearly." |
| | Spending more quality time | 2 | "Has allowed me to spend more quality time working with the children and has made days go by much easier and smoother." |

**Table 6**

*Conservative Dual Criterion Method Results for Children*

| Child | | Behaviour | # Needed | #Obtained | % Obt/needed | Significant |
|---|---|---|---|---|---|---|
| 1 | PSB | engaging with others | 26 | 0 | 0 | No |
| 1 | CB | fidgeting | 26 | 25 | 96 | No |
| 2 | PSB | engaging with others | 25 | 1 | 4 | No |
| 2 | CB | distracted from the task | 25 | 22 | 88 | No |
| 3 | PSB | engaging with others | 23 | 8 | 35 | No |
| 3 | CB | withdrawing from others | 23 | 21 | 91 | No |
| 4 | PSB | engaging with others | 29 | 3 | 10 | No |
| 4 | CB | distracted from task | 29 | 25 | 86 | No |
| 5 | PSB | following instructions | 11 | 0 | 0 | No |
| 5 | CB | withdrawing from others | 19 | 0 | 0 | No |
| 6 | PSB | following instructions | 12 | 1 | 8 | No |
| 6 | CB | withdrawing from others | 12 | 1 | 8 | No |
| 7 | PSB | participating in activities | 8 | 1 | 13 | No |
| 7 | CB | withdrawing from others | 15 | 13 | 87 | No |
| 8 | PSB | interacting with peers | 5 | 2 | 40 | No |
| 8 | CB | distracted from task | 12 | 1 | 8 | No |
| 9 | PSB | communicating with peers | 12 | 12 | 100 | Yes |
| 9 | CB | engaging in a tantrum | 12 | 12 | 100 | Yes |
| 10 | PSB | initiating peer interactions | 6 | 3 | 50 | No |
| 10 | CB | copying or repeating others | 12 | 6 | 50 | No |

*Note. PSB, positive social behaviour; CB, challenging behaviour*

### Early Childhood Setting 1

Each target child in this setting had the same PSB (children 1–4) but different CB (see Table 6). For all four children, their PSBs remained at a moderate to a high level throughout the intervention. Although none of the children's CB decreased to a statistically significant level, the children showed decreasing trends in their CB, which were approaching statistical significance. It is interesting to note that, for child 1, the graph indicates a mirror effect between PSB and CB, with an increase in the PSB being associated with a decrease in the CB, thus suggesting a potential correlation between the two behaviours. But this relationship is only present for some of the sessions.

### Early Childhood Setting 2

All three children in this setting (children 5-7) had the same PSB and CB For child 5, once the intervention began, their PSB decreased slightly to a moderate level and then increased to a high level, indicating attainment of this skill. Therefore, their PSB target behaviour was changed to engaging in social interaction. Once the PSB target behaviour changed, there was a decrease in the target behaviour to a moderate level, which then remained stable throughout the intervention. The CB of child 5 was variable throughout the intervention but stabilized to a moderate level toward the end.

Child 7's PSB met the mastery criteria and therefore, was changed to vocal self-expression with gestures. Following this there was an immediate decrease in the target behaviour to a variable low level. Although the reductions in child 7's CB were not statistically significant as only 13 of the 15 data points required to achieve significance were obtained, these results suggest a trend toward reductions in CB with the intervention.

### Early Childhood Setting 3

Regarding child 9, their PSB and CB at baseline both occurred at low levels. Once intervention began, their PSB increased while their CB remained low. The results demonstrated statistical significance for both their PSB and CB.

For child 10, there was an increase in the PSB when the intervention began, which remained stable for three days, as well as a decrease in CB. Therefore, both the target behaviours changed in response to the intervention. Toward the end of the intervention, the PSB occurred at a low to moderate level with a stable trend, and the CB occurred at a moderate level with a stable trend.

**Table 7**

*Conservative Dual Criterion Method Results for Educators*

| Educator | | Behaviour | # Needed | # Obtained | % Obt/needed | Significant |
|---|---|---|---|---|---|---|
| 1 | KP | teaching behavioural expectations | 24 | 0 | 0 | No |
| 1 | RF | providing general instructions | 24 | 0 | 0 | No |
| 2 | KP | teaching behavioural expectations | 18 | 1 | 6 | No |
| 2 | RF | providing general instructions | 18 | 0 | 0 | No |
| 3 | KP | teaching behavioural expectations | 26 | 0 | 0 | No |
| 3 | RF | providing general instructions | 26 | 0 | 0 | No |
| 4 | KP | teaching behavioural expectations | 25 | 5 | 20 | No |
| 4 | RF | providing general instructions | 25 | 0 | 0 | No |
| 5 | KP | referencing posted visuals | 9 | 2 | 22 | No |
| 5 | RF | not discussing emotions | 18 | 10 | 56 | No |
| 6 | KP | referencing posted visuals | 18 | 3 | 17 | No |
| 6 | RF | not discussing emotions | 18 | 9 | 50 | No |
| 7 | KP | referencing posted visuals | 12 | 7 | 58 | No |
| 7 | RF | providing generalized instruction | 12 | 4 | 33 | No |
| 8 | KP | referencing posted visuals | 12 | 7 | 58 | No |
| 8 | RF | not discussing emotions | 12 | 1 | 8 | No |
| 9 | KP | providing behavioral expectations | 8 | 2 | 25 | No |
| 9 | RF | positive/descriptive feedback | 8 | 2 | 25 | No |

*Note. KP, key practices; RF, red flags*

### Early Childhood Setting 1

All the educators in setting (educators 1–4) had the same KP and, and similar patterns of behaviour were observed for each educator. Following the coaching sessions, the educators demonstrated an increase in their KPs (see Figure 2). These results suggest that the coaching sessions supported the educator's implementation of the practices. The educators' RFs remained

low until the last two weeks of the intervention when there was a marked increasing trend in their RFs. This increase was due to a change in the daily schedule as it was summer, meaning the weather became warmer and the children spent more time playing outdoors and less time engaging in structured activities.

### *Early Childhood Setting 2*

Both educators had the same KP and RFFor educator 5, their KP increased to a high level after the fourth coaching session. Due to this improvement, their KP was changed to introducing problem-solving solutions to the classroom following the fifth coaching session. With the introduction of the new target, their RF decreased trend to a moderate level, while their KP remained stable at a moderate level. Educator 6's KP and RF remained at a similar level until the second coaching session, after which there was a decrease in their RF. However, their KP also demonstrated a decreasing trend until the completion of the intervention. This decrease in KP may be explained by the fact that the educator was focusing more on discussing emotions in the classroom, as demonstrated by the reduction in RF, which may have negatively impacted their KP due to no longer focusing on the target.

### *Early Childhood Setting 3*

Each of the educators had different KPs and RFs For educators 7 and 8, both of their KPs increased following the third coaching session. Specifically, in terms of educator 8, there was a decreasing trend in their RF as their KP increased. Educator 9's behaviours demonstrated variable trends and, interestingly, their RF increased as their KP decreased, thus indicating a relationship between the two behaviours.

Regarding child 8, their PSBs at baseline occurred at moderate to high levels with a variable trend, while their CB occurred at a moderate level with a variable trend. Once intervention began, there was a gradual decrease followed by a sharp increase in their PSB, while their CB demonstrated a variable increasing trend. As demonstrated by the graph in Figure 7, there was a mirror effect between PSB and CB, as CB increased as PSB decreased. Child 8's PSB target behaviour was changed to completing a task independently, as it was thought that focusing on a skill related to CB may lead to improvements in both behaviours. Toward the end of the intervention, there was an increasing trend in the PSB from a moderate to a high level, whereas there was a decreasing trend in the CB at a moderate level.

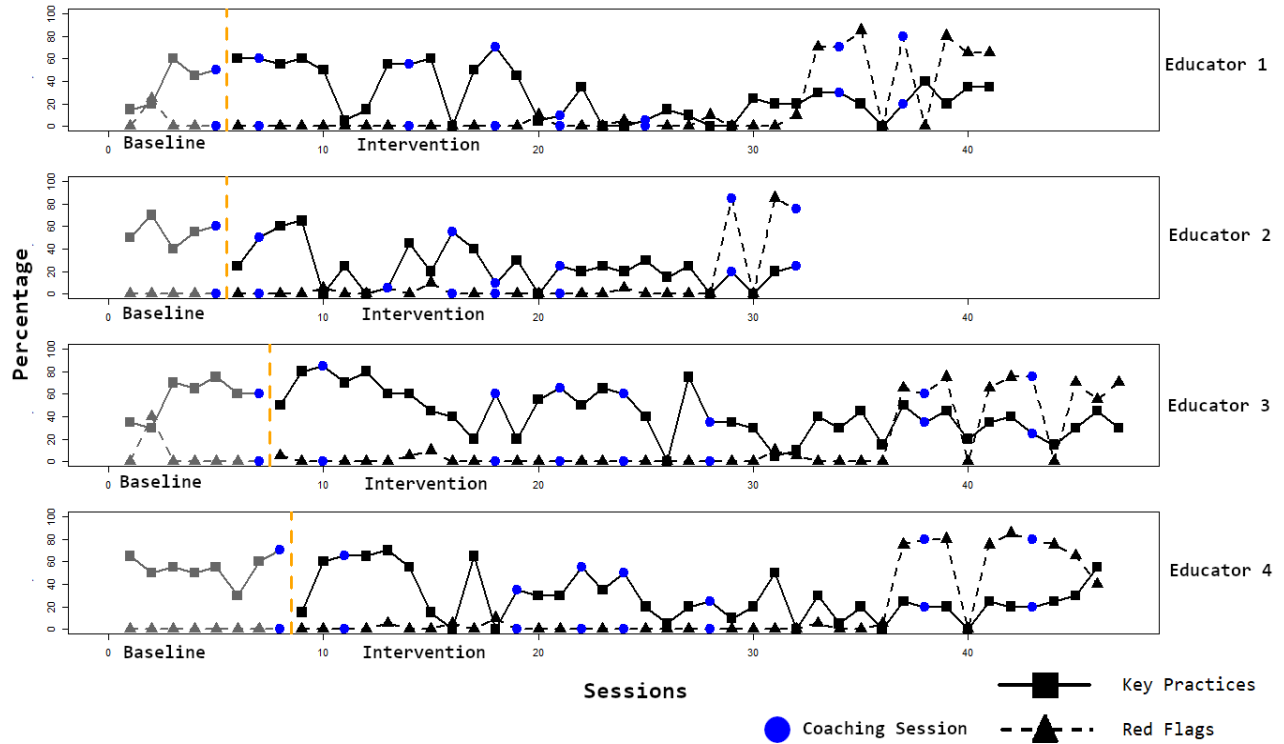**Figure 2**

*Educator's Practices in Early Childhood Setting 1*



**Figure 3**

*Children's Behaviours in Early Childhood Setting 1*
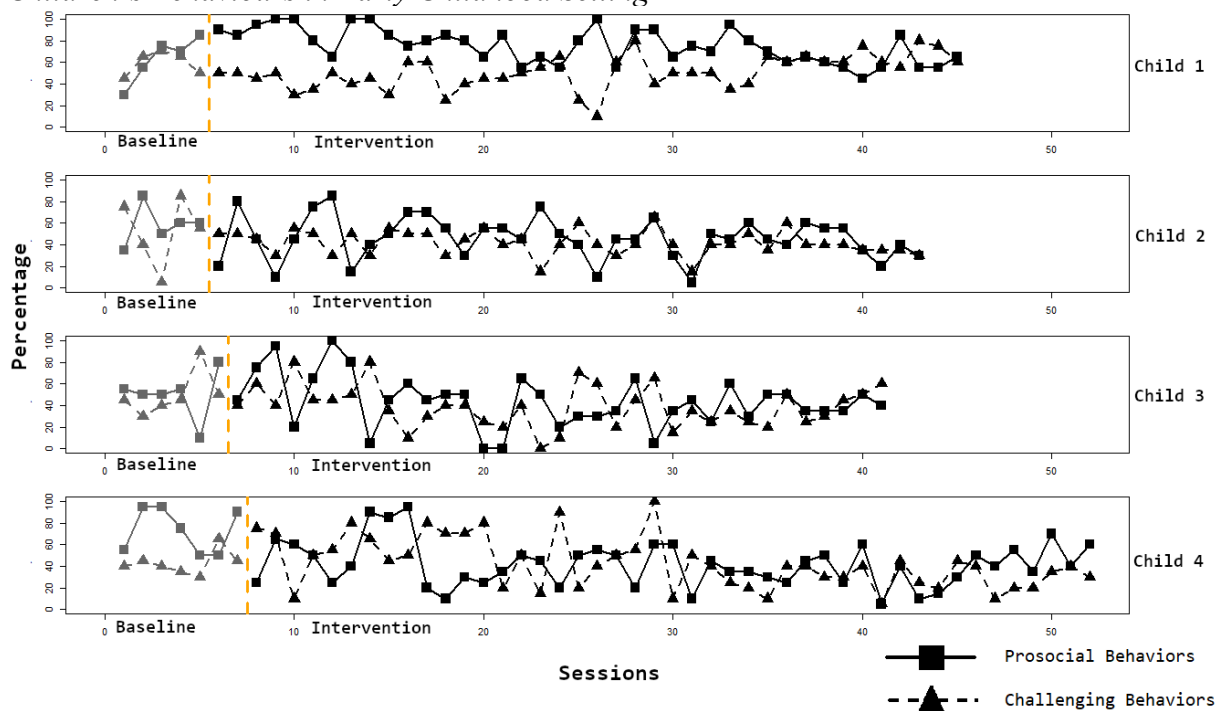
**Figure 4**

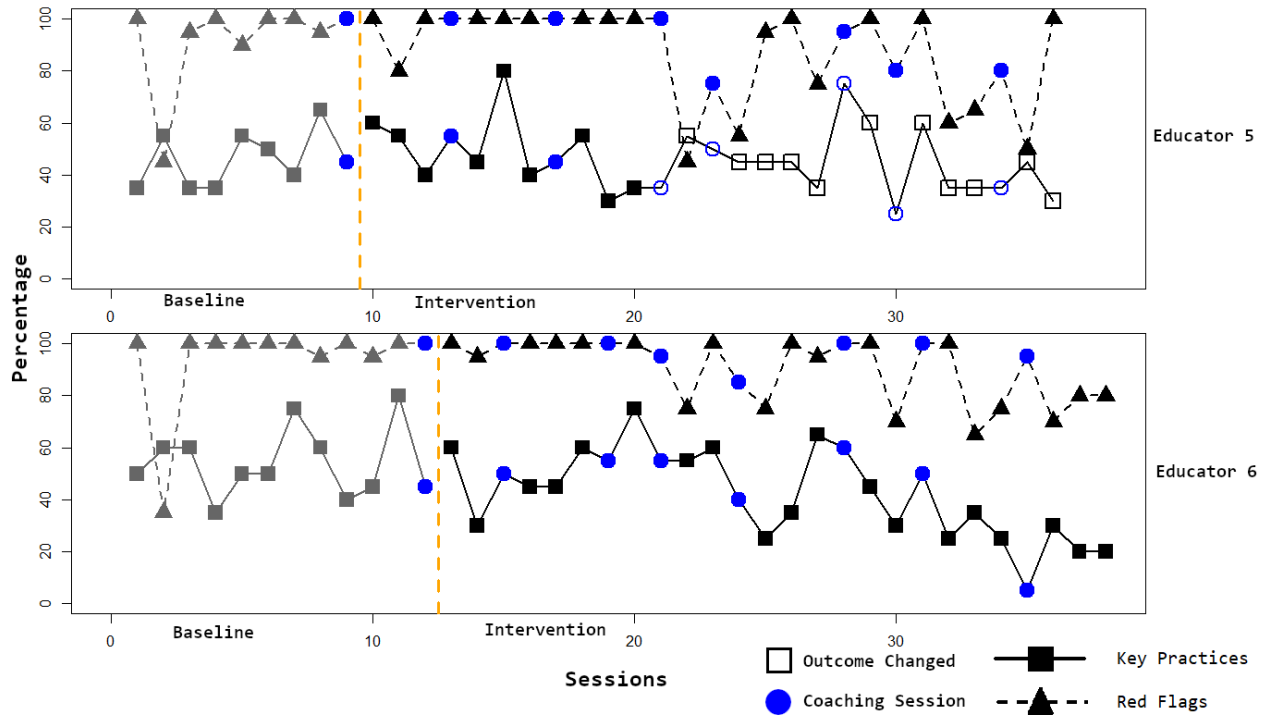*Educator's Practices in Early Childhood Setting 2*



**Figure 5**

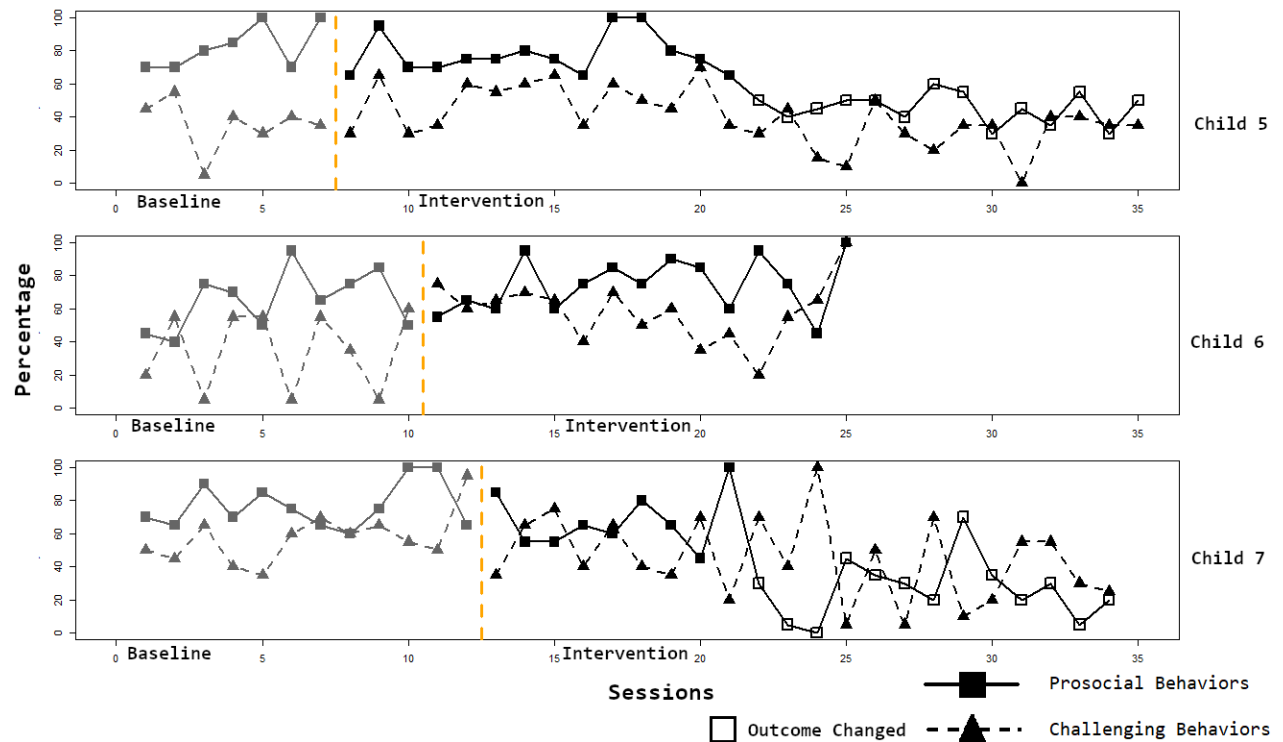*Children's Behaviours in Early Childhood Setting 2*

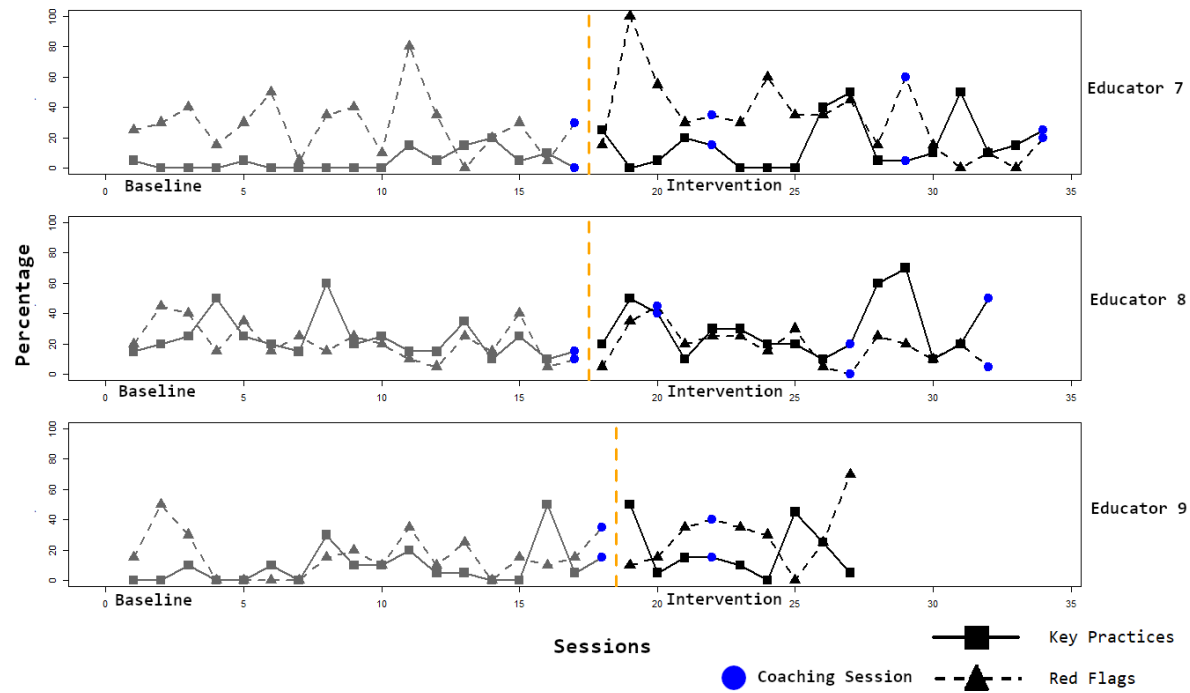# Figure 6

*Educator's Practices in Early Childhood Setting 3*



# Figure 7

*Children's Behaviors in Early Childhood Setting 3*