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Building inclusive preschool classrooms: How desirable and feasible is a set of strategies that facilitate teacher-child relationships?

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Positive teacher-child relationships promote children's engagement, as children feel more secure to explore and participate in free or oriented activities. For children with disabilities, a context wherein they can receive the support to maintain a positive engagement in different activities is even more relevant. A scarcity of research exists on how to promote ECEC quality, namely, how to facilitate teacher-child interactions in inclusive environments. This study aims to evaluate preschool teachers' opinions about the *desirability* and *feasibility* of a set of empirically validated strategies to improve teacher-child interactions in ECEC classrooms, for the group and children with disabilities. The participants were 89 Portuguese preschool teachers. Based on a non-systematic literature review, a questionnaire composed of 22 strategies to facilitate teacher-child interactions (in 4 dimensions: emotionally responsive interactions, classroom management, attend to children's perspectives, and scaffolding learning) was developed. Along with the questionnaire, a set of socio-demographic variables was also collected. ECEC teachers scored significantly higher in the *desirability* subscale compared with the *feasibility* subscale in all dimensions and at both the *child* and the *group* level. This gap between teachers' perceived *desirability* and *feasibility* provides important insights regarding the dimensions which are important to reinforce in ECEC teachers' education and professional development. The mean difference between the *desirability* and *feasibility* subscales registered a higher effect size at the *child*'s level than at the *group's* level, confirming that the inclusion of children with disabilities in preschool settings remains a challenge. Moreover, the effect size was small to moderate in the *Emotionally Responsive Interactions* dimension for both *child* and *group* levels. These results are aligned with previous studies stating that among different self-identified dimensions for improvement, emotional support is the less evoked by ECEC teachers. Across all dimensions, the main reason teachers give for difficulty in *feasibility,* both at the *group* and *child's* level, is lack of *knowledge*. Overall, understanding the reasons teachers attribute to

the difference between the strategies' *desirability* and *feasibility* informs the assessment of teacher education needs and might be operationalized as a new observation instrument.

KEYWORDS

teacher-child relationship, high-quality early education setting, children at risk, disability, engagement, inclusion, preschool classroom

Introduction

In the past two decades, the focus of early childhood education and care (ECEC) has increasingly been placed on child's belongingness, engagement and learning, as major outcomes of an inclusive school (Castro et al., 2017; Coelho et al., 2019), where all children find the appropriate support that enable them to fully participate in natural environments (EASNIE, 2017). Research has shown that high-quality ECEC settings contribute for children to be more engaged in activities and interactions (Aydogan, 2012; Arthur-Kelly et al., 2013; Hau et al., 2020), leading to more effective learning and development (McCabe and Altamura, 2011; Pianta et al., 2020a). In this regard, one of the most important dimensions of ECEC quality are teacher-child relationships, characterized by responsiveness, sensitivity, warmth, emotional tone, and emotional support. Teacher-child relationships are associated with a wide array of developmental outcomes in several domains, such as social, emotional, and cognitive, in the early years and beyond (e.g., McCormick et al., 2013; Hamre et al., 2014; EASNIE, 2017; Blewitt et al., 2020a,b; Nguyen et al., 2020), as well as children's engagement both in preschool (Raspa et al., 2001; Aydoğan et al., 2015; Sjöman et al., 2016; Coelho et al., 2019), and in childcare (Barros, 2007; Aguiar and McWilliam, 2013; Pinto et al., 2019a), and particularly, the engagement of children with disabilities (de Kruif et al., 2000; Almqvist, 2006). In fact, some studies highlighted the crucial role of teacher's interactions and behaviors in promoting the engagement of children with disabilities, as these children often need more support to get and maintain active and positive engagement in different activities in inclusive educational settings (Mahoney and Wheeden, 1999; McWilliam et al., 2003; Grande and Pinto, 2009). However, a scarcity of research exists on how to promote ECEC quality, namely, how to facilitate teacher-child interactions in inclusive environments, to draw meaningful implications for ECEC teachers training and education (e.g., Hu and Szente, 2010; Vieira-Rodrigues and Sanches-Ferreira, 2017), particularly focusing on the strategies/tools teachers can use to provide support in inclusive education. Moreover, instruments assessing ECEC quality tend to focus on the direct assessment of teacher-child interactions, mainly through observation (e.g., Classroom Assessment Scoring System, for parsimony, CLASS; Pianta et al., 2008), failing to address teacher's knowledge and needs regarding the implementation of specific strategies in daily pedagogical practices (i.e., whether or not they are desirable and feasible to implement, meaning their desirability and feasibility, regarding the group and the child). In this study, we will address this literature gap between teachers' desirability regarding a set of strategies and the perceived challenges regarding the implementation of these same strategies, by developing a new assessment instrument and grid of observation to collect teachers' opinions about the desirability and feasibility of a set of empirically validated strategies to be used in preschool classrooms at the group or child level.

Literature review

Teacher-child interactions and child developmental outcomes

High-quality early educational settings have been consistently associated with positive child outcomes (Burchinal, 2018; Felfe and Lalive, 2018; Clark et al., 2020; Nguyen et al., 2020; Osher et al., 2020). These effects have been found across domains and skills, such as social-emotional development and social competence (Rucinski et al., 2018; Saral and Acar, 2021); self-regulation, prosocial behavior, and peer interaction (Cadima et al., 2016; Acar et al., 2022); behavioral regulation and physiological regulation (Acar et al., 2018); behavioral adjustment, inhibitory control, school readiness, and learning behavior (Acar et al., 2022); language development and pre-academic skills in literacy and math (Slot et al., 2018; Pakarinen et al., 2021); executive functions, cognitive development, school engagement, and motivation (Heatly and Votruba-Drzal, 2019; Önder et al., 2020); children's self-perception, internalizing problems, and mental health outcomes (Zatto and Hoglund, 2019; Blewitt et al., 2020a,b; for a meta-analysis see Perlman et al., 2016; Brunsek et al., 2017; Egert et al., 2018).

Positive outcomes have been found for young children across samples of varying risk level, including those with and without disabilities, and across different socio-economic backgrounds, including those from low and middle-income countries (Rhoad-Drogalis et al., 2018; Chen and Wolf, 2021;

Goldberg and Iruka, 2022). Studies around the world (e.g., Europe, China, Brazil, Chile, Colombia, Ghana, Greece, Latin America and the Caribbean, Kenya, Turkey, and the United States) have reported these associations using both cross-sectional and longitudinal study designs (e.g., Lazzari et al., 2013; Yoshikawa et al., 2015; Gregoriadis et al., 2016; Kagan et al., 2016; Mungai et al., 2017; Soliday Hong and Udommana, 2018; Acar et al., 2019; Bernal et al., 2019; Ponguta et al., 2019; Rosa and Menezes, 2019; Wolf et al., 2019; Liu et al., 2020; Wang et al., 2020; Önder et al., 2020; Hu et al., 2021; Yang et al., 2021; Bartholo et al., 2022). Positive associations between ECEC quality and children's learning and development have also been found across developmental stages and educational settings, including childcare centers and kindergartens (Liu et al., 2020). In Portugal, the same pattern of results has been found, both in childcare center settings and preschool (e.g., Pessanha et al., 2007, 2017; Barros and Aguiar, 2010; Barros et al., 2016, 2018; Pinto et al., 2019a; Guedes et al., 2020; Coelho et al., 2021, 2022; Cadima et al., 2022; Fuertes et al., 2022) and for both children at-risk and children with no known risk associated (e.g., Cadima et al., 2018; Aguiar et al., 2019; Pinto et al., 2019b).

Therefore, in early educational settings, it is important to study the *preschool classroom quality*, particularly, the classroom *structural quality,* which refer to regulable characteristics (e.g., teacher-to-child ratio, group size, years of experience, and teacher education levels), and the classroom *process quality,* which relates to children's daily experiences in the classroom context, including their interactions with teachers and peers and their engagement in school activities (e.g., teacher-child interactions), features that promote learning and development for all, in inclusive settings (Phillips and Howes, 1987). *Process quality*, and particularly teacher-child interactions, are especially relevant given its direct association with a wide range of child outcomes. According to the bioecological model of human development (Bronfenbrenner and Morris, 2006), human development is fueled in part by the interrelationships among characteristics of people, the contexts they are situated in, and the processes that take place within those contexts. Children's classroom behaviors are better understood as a dynamic attribute of the teacher–child system, rather than as a characteristic of the children themselves, i.e., it is an outcome of a dynamic interplay between characteristics at different levels including the intrapersonal, interpersonal, and contextual level. From an ecological systems perspective, development occurs as a function of the continuous interaction between the child's characteristics and the close context—the so-called *proximal processes of development*. *Proximal processes* are the engines that drive development. When we consider this model in an educational setting, teacher-child relationships are the driving force, the *main ongoing proximal processes* that drive children's development in early childhood classrooms. Children learn through frequent and continuous interactions with teachers, peers, and all the elements of their social and physical environments. This view highlights the importance of teachers' support and challenge in determining children's active and positive involvement with classroom tasks (Davis, 2003); children will likely display greater engagement when their teacher is attuned and responsive to children's cues and interests and matches the level of scaffolding to the children's needs.

Teacher-child relationships refer to the cumulative and ongoing interpersonal connections that develop over time between teachers and individual children in their classroom, the *"daily back-and-forth exchanges that teachers and children have with one another throughout each day, including those that are social and instructional in nature"* (Hamre et al., 2012, p. 89). Though behavioral indicators of such relationships could be assessed through repeated observations over extended periods of time, teacher–child relationships are typically measured by means of teacher report, often using the Student Teacher Relationship Scale (STRS; Pianta and Steinberg, 1992). As such, teacher–child relationships reported in the literature most often reflect the teacher's perception of the relationship. There has been an accumulation of evidence indicating that high-quality teacher-child relationships, characterized by supportive and sensitive teacher–child interactions, are beneficial to children's social and academic development, with positive outcomes at different functioning levels (e.g., behavior, cognitive, affective/social-emotional, and school readiness/success) (e.g., Sabol and Pianta, 2012; Hamre, 2014; for a meta-analysis see Perlman et al., 2016; Perlman et al., 2017). Based on the attachment theory (Bowlby, 1969), teacher–child interactions support children's engagement, at least in part, indirectly; warm and positive interactions with teachers promote children's feelings of security—a sense of trust, comfort, or equilibrium—to explore the classroom environment (Birch and Ladd, 1997; Williford et al., 2016). According to the emotional security hypothesis (Davies and Cummings, 1994; Davies and Martin, 2013), in moments of stress (e.g., frustration with a task, difficult interactions with peers) children rely on their teachers for support, to preserve and attain security (Little and Kobak, 2003; Thijs et al., 2008). The stability and predictability of sensitive and responsive interactions is theorized to reassure a child that the teacher is available, thus advancing a child's feelings of security. As early childhood classrooms place cognitive and social demands that may elicit stress on children (e.g., Watamura et al., 2003), preschool teachers are salient resources to support all children's stress regulation (e.g., Badanes et al., 2012; Hatfield et al., 2013) and help them reengage with classroom tasks/activities. This support system is especially important for children with disabilities.

Considering the importance of *process quality* in ECEC settings, some dimensions related particularly to teacher-child interactions, have been commonly used in previous studies, and were an important framework for the current study, namely:

emotional support, classroom organization, and instructional support (Pianta et al., 2008).

Emotional support

Briefly, an emotionally supportive environment is characterized by high levels of teacher sensitivity and regard for children's perspectives and a positive emotional climate with low levels of negativity between teachers and children (Pianta et al., 2008). Markers of an emotionally supportive classroom are teacher behaviors indicating that he or she is in tune with children's needs and responsive to their cues, developmentally appropriate opportunities for children to make decisions and show leadership, and a warm and accepting classroom environment. Support in the classroom, particularly during early childhood, is recognized as a mechanism for fostering not just social but also academic success in elementary grades. Indeed, children who feel safe with and valued by the teacher are likely to be mentally ready to handle academic information, whereas children who are worried or feel uneasy in the classroom may be preoccupied and unable to take in new information. This domain also includes the constructs of individualized dyadic interactions, management of activities in the child-group, and regard for children's perspectives. Typically, regarding emotional support, teacher–child relationships are viewed as consisting of two dimensions: closeness and conflict. Closeness represents high levels of warmth, positive affect, and approachability between teacher and child (Pianta et al., 1995, 1999) whereas conflict represents negativity and lack of rapport (Ladd and Burgess, 2001). Supportive, warm, responsive, and sensitive teacher–child interactions and relationships are critical for children's academic and social development (Sabol and Pianta, 2012; Hamre, 2014). Previous studies show that effective teacher–child relationships develop through reiterated interactions characterized by shared affect and emotional engagement, teachers' sensitivity and responsiveness, and low conflict (Pianta et al., 2003). For instance, research using the CLASS indicates that when teachers offer warm, supportive, and responsive interactions, children develop stronger social and emotional skills (e.g., Johnson et al., 2013).

Instructional support

Instructional support is characterized by scaffolding, questioning, and feedback exchanges between teachers and children. A classroom with high instructional support has rich and detailed interactions between children and teachers that are linked to and extend academic content. In this domain, the constructs of planning activity settings and scaffolding learning are also highlighted. There is evidence that instructional support promotes children's academic performance (Pianta et al., 2002; Perry et al., 2007) and can buffer elementary school-age children against low achievement if they are at risk because of low socioeconomic status or poor attention (Hamre and Pianta, 2005).

Classroom organization

Classroom organization is the dimension of teacher-child interactions through which teachers organize behavior, time, and attention (Emmer and Stough, 2001). Teachers using more effective behavior management strategies (Evertson et al., 1983; Arnold et al., 1998; Evertson and Harris, 1999; Emmer and Stough, 2001), having more organized and routine management structures (Bohn et al., 2004; Cameron et al., 2005), and implementing strategies that make children active participants in classroom activities (Vygotsky and Cole, 1978; Rogoff, 1990; Bruner, 1996; Stott and Bowman, 1996) have less oppositional behavior, higher levels of engagement in learning, and ultimately, children who learn more. This domain also includes behavior management (rules, consistency), social cooperation (peers' interactions), and conflict resolution.

Although we know, as the literature reviewed here shows, that ECEC quality is important for the developmental outcomes of children (with or without disabilities), *what does the research say about the global and process quality of classrooms?*

Research results related to global ECEC quality for young children in inclusive and non-inclusive programs are inconsistent (Bruder and Brand, 1995; La Paro et al., 1998; Buysse et al., 1999; Hestenes et al., 2007; Pelatti et al., 2016), which has been a cause of concern for parents, educators, and policymakers.

Some studies have found that inclusive and segregated programs were similar in quality, with levels of quality moderately high in both types of settings (La Paro et al., 1998). Despite a relative lack of specialized training in teaching children with disabilities and relatively high child-teacher ratios, in inclusive classrooms, teacher behaviors and levels of attention to children were similar to teachers working in segregated early childhood special education classrooms (Hundert et al., 1998). In addition, children with disabilities in inclusive and segregated classrooms showed similar levels of participation in small and large group activities and low rates of solitary play and antisocial behavior. La Paro et al. (1998) also reported that the same percentage of inclusive and non-inclusive classrooms met the criteria for developmentally appropriate practices, with 14 (48 percent) of the self-contained programs scoring 5 or above (developmentally appropriate) and 15 (52 percent) of the inclusive classrooms scoring 5 or above on the Early Childhood Environment Rating Scale (ECERS; widely used to indicate programs that are developmentally appropriate). However, due to the small sample size, the results of this study need to be interpreted with caution.

Other studies have highlighted differences when comparing inclusive and segregated settings (Sontag, 1997; Kishida and Kemp, 2009). In general, segregated classrooms had the following features: more homogeneous grouping, more

specialized teachers, smaller class sizes, and higher adult-child ratio than inclusive programs. Mahoney et al. (1992) suggested that there might be important differences in the types of teacher behaviors that are inherent in ECEC and early childhood special education classrooms. Typically, inclusive programs have a theoretical and philosophical background that encourages teachers to promote child-initiated activities and abstain from being highly directive with children. In contrast, segregated programs are often based on the belief that children need direction and guidance to acquire desired developmental skills.

Some research comparing the quality of preschool inclusive and non-inclusive classrooms has found inclusive classrooms to be of higher quality (Bruder and Brand, 1995; Buysse et al., 1999; Hestenes et al., 2007). Buysse et al. (1999) found that 62 inclusive programs scored better on a global quality measure than did non-inclusive programs. Bruder and Brand (1995) had similar results for their study in which they compared inclusive programs for toddlers with non-inclusive programs: inclusive programs observed were of higher quality than non-inclusive programs. Hestenes et al. (2007) reported that not only was the overall quality of inclusive preschool classrooms higher but that inclusive preschool classrooms were higher on both an activities/materials factor-based scale and a language/interaction factor-based scale of the Early Childhood Environment Rating Scale-Revised (ECERS-R). Teachers in the inclusive classrooms also had significantly higher levels of education and more coursework in special education (compared with teachers in non-inclusive classrooms). Teachers in inclusive classrooms were rated higher on their interactions with preschoolers, based on scores on the Teacher-Child Interaction Scale (TCIS). Results also indicated that no differences existed in classroom quality based on the level of severity of children with disabilities who were enrolled (Hestenes et al., 2007).

In some studies, inclusive classrooms have been described as an optimal context for teachers to promote social skills and peer interactions, because these environments provide opportunities for children to learn by observing and imitating typically developing peers and also to learn from teacher-lead direct intervention (e.g., Bronson et al., 1997; Sontag, 1997; Terpstra and Tamura, 2008). Research has confirmed that children with mild disabilities exhibited higher levels of peer interaction in inclusive groups, when compared with segregated groups (Kishida and Kemp, 2009). Children with disabilities in inclusive settings have also been observed to be more independent and less controlled by teachers (Bronson et al., 1997; Kishida and Kemp., 2009). They were also less often engaged in unoccupied play, and exhibited fewer inappropriate or self-abusive behaviors than children in segregated programs (Erwin, 1993).

Similarly, in ECEC for children younger than 3 the results are also inconsistent. Although there is evidence suggesting that inclusive settings may be of higher quality than non-inclusive settings, other studies report no differences across settings. For instance, while Hestenes et al. (2009) found that infant and toddler classrooms that include children with diagnosed disabilities were significantly higher in quality than classrooms that did not include children with disabilities and the enrollment of children with disabilities did not diminish the overall classroom quality below the level of what is considered to be developmentally appropriate (a score of 5 on the 7-point scale); in Portugal, previous research focusing on the associations between global classroom quality and the social acceptance of children with disabilities in inclusive ECEC settings found no evidence of such associations (e.g., Aguiar et al., 2010).

Because of inconsistent findings, further examination is needed to determine whether there are differences between inclusive and segregated programs in both teacher behaviors and peer interactions by children with disabilities. It would be interesting to conduct research on how the classrooms including children with disabilities differed with regard to teacher behaviors. Do teachers with more special education coursework interact with children in a manner that encourages involvement and acceptance of children with disabilities? It also would be important to examine the relationship between teacher-child ratios and appropriate engagement with children for teachers who have more education. It seems that continuing to educate the ECEC staff regarding the importance of inclusive environments, appropriate interactions with children with and without disabilities, and knowledge of best practice would increase the number of children with disabilities served in high-quality inclusive environments.

Teacher-child interactions may be particularly important for children at risk. These relationships are particularly salient resources for children who, for various reasons (e.g., with disabilities, low achievement or display of externalizing behavior problems), are likely to experience the classroom setting as socially or academically challenging (Hamre and Pianta, 2005; Baker et al., 2008; Castro-Kemp and Samuels, 2022). For children with disabilities and children at-risk (e.g., from disadvantaged backgrounds), high-quality inclusive environments potentially act as a buffer mechanism for negative life experiences and risk factors, serving as a protective (compensatory) mechanism to promote child engagement and resiliency within the classroom environment (Hall et al., 2009; Frawley, 2014; Melhuish et al., 2015). For example, Buyse et al. (2008) found positive effects of emotionally supportive interactions for children at risk of establishing less close and more conflictual relationships with teachers because of their internalizing and externalizing behavior. Similarly, moderation effects of emotional support were found for prosocial behaviors of children with caregivers with depressive symptoms (Johnson et al., 2013). Furthermore, children from poor families seem to improve their social skills and adjusted behavior when experiencing high levels of emotional support (Burchinal et al., 2010). Interestingly, moderate-to-low emotional support

does not seem to predict social competence but positively predicts behavior problems (Burchinal et al., 2010). Focusing on indicators of children's social acceptance within the peer group, Mikami et al. (2012) reported low social preference stability for children attending classrooms with higher levels of emotional support, which may translate into increased opportunities for children with initial lower social preference. However, children with high levels of externalizing behavior showed decreases in social preference throughout the school year, regardless of the level of emotional support provided by teachers. Collectively, these findings support the expectation that teacher-child interactions may also play an important role in fostering the social development of a particular type of disadvantaged children, that is, children with disabilities.

However, research suggests that promoting high-quality interactions in educational settings is a challenge for teachers, and that this challenge can be even higher in inclusive settings, as teachers need to be responsive to a wider span of children's needs (Downer et al., 2010; Logan et al., 2011; Chung and Carter, 2013; Pelatti et al., 2016; Goble and Pianta, 2017; Cadima et al., 2018; Hu et al., 2018; Cash et al., 2019; Langeloo et al., 2019). For teachers in inclusive classrooms, the challenge of high-quality interactions is even greater as they strive to be responsive to the needs of all children with and without disabilities. In fact, inclusion needs to be balanced to provide rich opportunities for participating and being engaged in the same activities as other children and at the same time receive needed support. For example, Soukakou (2012) found that teachers in inclusive classrooms seldom used high-quality feedback. The types of interactions and conversations that are conducted with children with and without disabilities influence all facets of children's development, including their ensuing interactions with peers. Measurement of teacher–child interactions seems particularly important in understanding this dimension of process quality across settings. Researchers in the field are called upon to study this important aspect of inclusion (Odom, 2000).

Some studies suggest that some dimensions of quality of teacher–child interactions in inclusive classrooms tend to be higher than in non-inclusive environments (Hestenes et al., 2008; Grisham-Brown et al., 2010; Pelatti et al., 2016). For instance, Pelatti et al. (2016) found that inclusive preschool classrooms tend to show higher levels of teacher emotional support; however, non-inclusive classrooms showed significantly higher levels of teacher instructional support.

In classrooms that include children with disabilities, teachers' interaction patterns appear to be somewhat different from their interactions with typically developing children. Teachers are generally observed to be more directive and less child centered (not supportive of child-initiated activities) in their interactions with children with disabilities (Goodman et al., 1992). Results of another study found that teachers who were highly responsive and moderately directive in their behavior were more successful in engaging children with disabilities in meaningful activities in the classroom (Mahoney and Wheeden, 1999). Teachers' differing styles of interaction patterns with children with disabilities has been an issue of debate in the field.

Furthermore, several studies have revealed that teachers use more directives with children with disabilities than with typically developing children (Stipek and Sanborn, 1985; Quay, 1991; File, 1994; Chow and Kasari, 1999; Hestenes et al., 2004). File's research (1994) indicated that teachers in inclusive preschool classrooms were more directive (e.g., asking closed questions) of the cognitive experiences of children with disabilities than of the cognitive experiences of typically developing children. Also, teachers were more likely to support cognitive play than social play behaviors. Indeed, support of social play (play with peers) was relatively infrequent (only 2%). Furthermore, Quay (1991) reported that teachers were more negative toward children with disabilities than toward typically developing children.

Studies of inclusive classrooms have suggested that teachers may be more involved with children with disabilities than with other children (Brophy and Hancock, 1985; Hundert et al., 1993; Chow and Kasari, 1999), although their involvement is mixed in terms of its appropriateness. For example, Chow and Kasari (1999) found that at the beginning of the school year in inclusive classrooms, teachers initiated more negative and task-related interactions with children with disabilities than with their typical peers. However, at the end of the school year, teacher interactions with the children with disabilities were similar to those with the typically developing children. Research has also indicated that teacher presence is predictive of more interactions between preschool children with and without disabilities in inclusive classrooms (Hestenes and Carroll, 2000). The teacher's role and involvement with young children is clearly a key aspect underlying process quality in inclusive classrooms.

Teacher-child interactions and child engagement

Children's engagement is an auspicious target involved in preschool developmental pathways and learning outcomes (e.g., Castro et al., 2017; in Portugal see Aguiar and McWilliam, 2013; Coelho et al., 2019).

Engagement is the amount of time the child spends interacting with the environment (adults, peers, and materials) in a developmentally and contextually appropriate manner, at different levels of competence (McWilliam, 1991; McWilliam and Bailey, 1995; McWilliam and Casey, 2008). This definition embeds both the quantity and quality of children's behaviors and acknowledges the multidimensionality of the construct in terms of behavioral (positive efforts and involvement with academic activities), cognitive (self-regulations of one's investment or commitment in the learning process), and

social-emotional engagement (affective reactions to teachers or peers and activities in the classroom; Newmann, 1992; Skinner and Belmont, 1993; Fredricks et al., 2004). Studies in preschool settings have focused on the behavioral components of engagement (McWilliam et al., 2003), while studies with school-aged children have on the most part addressed the cognitive and emotional aspects of engagement (Finn, 1989; Neumann et al., 1992; Martin and Rimm-Kaufman, 2015).

Since researchers generally view children's classroom engagement as flexible to change (Fredricks et al., 2004), an important step in designing improvements in the quality of children's participation, particularly those with disabilities, in learning activities is the identification of classroom contexts and features associated with active child engagement, such as the classroom emotional climate and the quality of teacher-child interactions.

Several studies have reported a link between teacher–child interactions and children's engagement, in childcare for infant/toddlers (e.g., Pinto et al., 2019a), in preschool (e.g., Vitiello et al., 2012; Williford et al., 2013a,b; Weyns et al., 2018; Yoder et al., 2019; Alamos and Williford, 2020), elementary school and middle school (e.g., Hosan and Hoglund, 2017; Buhs et al., 2018; LoCasale-Crouch et al., 2018; Heatly and Votruba-Drzal, 2019), and beyond, including adolescence (Dotterer and Lowe, 2011; De Laet et al., 2016; Wang et al., 2020). Substantial research now indicates that the quality of dyadic teacher–child interactions play a key role in facilitating young children's active and positive participation in classroom activities, as well as their wellbeing, agency, inclusion, and significant learning. Generally, children demonstrate higher levels of engagement when they experience warm and sensitive interactions with their teachers that support their autonomy (e.g., Birch and Ladd, 1997; Hughes and Kwok, 2006).

Positive task engagement is characterized by children's enthusiastic, self-directed, and active involvement with classroom activities (Fantuzzo et al., 2004; Downer et al., 2010). Children's ability to participate and persist in classroom activities and learning tasks has been linked to the development of school readiness skills (McClelland et al., 2000, 2007; Hughes and Kwok, 2006). Studies suggest that preschool children's positive engagement with tasks and activities is associated with better attention and impulse control (Chang and Burns, 2005; Bierman et al., 2009). Furthermore, it has been suggested that interest and engagement in an activity strengthens inhibitory and attentional control during the activity (Pessoa, 2009). However, as Vygotsky's theory emphasizes, children do not engage in classroom tasks and activities in isolation of their social relationships. Birch and Ladd (1996, 1997) asserted that children's relationships with teachers and peers can serve as either supports or stressors that may facilitate or hinder children's classroom adaptation and participation.

Children with disabilities tend to engage in lower levels of social play, initiate peer interaction less often, spend less time interacting with peers, are less often chosen as playmates, and are more likely to be rejected by peers than typically developing children (Odom and Diamond, 1998; Pierce-Jordan and Lifter, 2005). In this vein, some studies highlighted the crucial role of teacher's interactions and behaviors in promoting the engagement of children with disabilities (e.g., Mahoney and Wheeden, 1999; Almqvist, 2006; Grande and Pinto, 2009), as these children often need more support to get and maintain active and positive engagement in different activities in the educational settings. For instance, research results show that teacher interactive styles are related to higher levels of engagement and participation of children with disabilities (e.g., Mahoney and Wheeden, 1999; de Kruif et al., 2000; McWilliam et al., 2003; Grande and Pinto, 2009), with teacher responsiveness and emotional tone influencing the levels of engagement of children with disabilities. Similarly, a study by McWilliam et al. (2003) found that elaborations and information giving were associated with children's engagement and that interactions targeted at individual children with disabilities produced more engagement on the part of the children than did group-targeted interaction.

Despite the crucial role of teacher's interactions and behaviors in promoting the engagement of children, with or without disabilities, some studies have shown that preschool teachers are inconsistent in promoting high-quality teacher–child interactions (e.g., Aguiar et al., 2010; Cadima et al., 2018; Coelho et al., 2019, 2022). Therefore, since teacher-child interactions have been associated with teacher's education, experience, and training in ECEC (e.g., Fukkink and Lont, 2007; Hu et al., 2018; Fukkink et al., 2019; for a meta-analysis see Egert et al., 2018), teachers' education can be an excellent opportunity for teachers to develop their relationships, interaction strategies and play skills.

Understanding the primary role of interactions and relationships in creating the capacity for children to engage the classroom as a setting for development and learning is a fundamental precursor to understand the approach to measuring interactions and to changing classroom settings' capacity for engagement. Studies in the everyday life of the preschool environment based on a deeper understanding of engagement and its role in providing support in inclusive education are needed.

Changing teacher-child interactions through professional development

Knowing that teacher-child interactions are crucial in supporting children's development and learning, the challenge is to improve teacher-child interactions. Research in early childhood education generally indicates that effective professional development combines specific training on novel skills, coupled with in-service coaching or consultation

(Sheridan et al., 2009). Such professional development has been shown to be effective in improving instruction and children's outcomes in targeted content areas such as literacy (Powell et al., 2010; Landry et al., 2011; Wasik and Hindman, 2011) and math (Clements et al., 2011). The current work focuses on teacher-child interactions more generally, rather than focusing on a content area. Moreover, before creating a solution we must know the problem (i.e., identify the teacher's needs to improve their education opportunities).

One of the most used measures to evaluate the quality of interactions between teachers and children in preschool settings is the CLASS (Pianta et al., 2008). Although substantial research base shows a positive relationship between CLASS scores and gains in child outcomes, with hundreds of studies reporting significant relations between them (e.g., Nichd Early Child Care Research Network, 2002; Mashburn et al., 2008; Sabol et al., 2013), these relationships, when significant, are typically small (Keys et al., 2013; Araujo et al., 2016), with modest effect sizes (in the range of 0.05–0.10) and in many instances non-significant (Burchinal et al., 2011; Perlman et al., 2016; Brunsek et al., 2017). Evidence from causal designs that include random assignment of children to teachers show CLASS with significant, small causal effects of teacher-child interaction on learning (Carneiro et al., 2019). Reports of modest or no association(s) with child outcomes rightly prompt calls to develop new and improved measures of quality. We posit that two limitations might underlie these results: (1) umbrella-terms and the difficulty in finding conceptual coherence/consistency among studies (for a systematic review see Djamnezhad et al., 2021) and (2) the lack of teachers reflective functioning, regarding their own knowledge and pedagogical practices, involved in the assessment. In fact, in CLASS (Pianta et al., 2008), as in other ECEC quality assessment instruments, in addition to the assessment of the quality of teacher-child interaction, the implementation of specific strategies in daily pedagogical practices should also be assessed (i.e., whether they are desirable and feasible to implement—their desirability and feasibility).

Studies that focus on the nature of and between teacher thought and action are making a significant contribution to how and why teachers do what they do amidst the complexity of the classroom (Schoenfeld, 1999). However, the literature is still scarce. Only a few studies have addressed the feasibility of strategies use in preschool classrooms. Additionally, it is important to explore the teacher's perspective regarding their desirability (i.e., which strategies they consider more desirable). Understanding the reasons teachers attribute to the difference between the strategies desirability and feasibility informs the assessment of teacher education needs and might be operationalized as a new observation grid. These aspects are input to teachers' education and professional development that are both effective and efficient. By evaluating the difference between the desirability and feasibility of these strategies implementation (as well as the reasons that teachers attribute to these differences), we address the need to develop and implement practical and explicit pedagogical strategies that (1) will respond directly to teachers' difficulties/limitations—*"strategies that are important but hard-to-do*," (2) are built on teachers' current knowledge and expertise, (3) are embedded into their daily practice and can be used in a daily basis effectively (i.e., making it a feasible practice), and (4) are tailored to the social, emotional, and behavioral needs of the child as well as the child within the group. Committing to early childhood interaction strategies and inclusion practices means committing to early childhood teacher education for inclusive practices. Knowledge about disabilities alone appears inadequate to achieve quality inclusion. Perhaps more importantly, teachers need hands-on experiences with effective pedagogical approaches to work with children with disabilities in inclusive settings. Currently, a scarcity of research exists on how to facilitate inclusion to draw meaningful implications for ECEC teacher education (e.g., Hu and Szente, 2010; Vieira-Rodrigues and Sanches-Ferreira, 2017). Therefore, this study seeks to examine the variables or key characteristics concerning both teachers' perspectives of the perceived importance and feasibility of high-quality inclusion strategies and ECEC teacher-child interaction needs to provide direction for future teacher. For example, we need to address teachers' perspectives regarding the knowledge and skills they perceive to have to explore if they need coursework offering for successful inclusion practices. Certainly, prior research in Portugal has shown that such courses are currently not offered or required in most teacher education programs (e.g., Monteiro et al., 2020). Perhaps, teachers who have taken courses related to special education or inclusive education, or who have previous experience with children with special needs, are more likely to perceive inclusion as both important and feasible. Therefore, it is important that this research address how these key characteristics, such as preservice teachers' special education coursework, and previous experiences with children, influence their perceptions about the importance and feasibility of high-quality inclusion.

The present study

Based on the accumulated evidence regarding the interaction between quality of environment and child engagement, several authors have developed assessment tools to study aspects of early childhood settings, identifying a range of strategies and intervention approaches recommended as practices to promote engagement within daily classroom routines/activities (Pianta et al., 2020b; Djamnezhad et al., 2021). Despite the extensive empirical findings about strategies contributing to the quality of ECEC settings and to child engagement, a gap still exists between evidence-based practices and the practices teachers develop, suggesting that there is often a tension between teachers' knowledge, beliefs, and practice

(Stipek and Byler, 1997; Pianta et al., 2009; Hamre et al., 2012). Little is known about how teachers consider specific practices in ECEC as desirable and feasible and what factors (i.e., knowledge, human resources, material resources, and time) contribute for teachers to use them with a particular child and/or with the whole group.

Therefore, this study aims to evaluate preschool teachers' opinions about the *desirability* and *feasibility* of a set of strategies, empirically validated, to promote teacher-child interactions in ECEC classrooms, for the group and the child/children with disabilities (within the group). The following research questions are addressed:

> Research Question 1: *According to ECEC teachers, how desirable and feasible is a set of strategies to promote group engagement and the engagement of children with disabilities?*

> Research Question 2: *Are there differences between ECEC teachers' desirability and feasibility ratings of the strategies to use at the child and group levels?*

> Research Question 3: *What reasons do teachers attribute to the feasibility of strategies to use with the group and the child with disability?*

> Research Question 4: *Are individual (e.g., years of teaching experience) and contextual (e.g., number of children per classroom) variables associated with the scores that teachers assign to the desirability and feasibility engagement strategies for the group and the child with disabilities?*

To answer these research questions, a questionnaire focused on specific strategies fostering the quality of teacher-child relationships was developed based on a non-systematic literature review of the most used instruments to assess ECEC quality.

Materials and methods

Participants

The participants were 89 Portuguese preschool teachers (85 female, 95.5%), aged between 25 and 63 years (M = 48.41 years, SD = 9.46). Regarding continuing professional development, 30 teachers (33.7%) had additional training, namely 11 teachers (12.4%) had a master's degree in special education, 10 teachers (11.2%) had a master's degree in other areas of education and 8 teachers (9%) had other complementary training (e.g., workshop on emotional education and mindfulness) and 1 teacher had a PhD (1.1%). Regarding professional experience, 27 teachers had between 10 and 20 years (30.3%) and 6 teachers had less than 10 years of experience (6.7%). Regarding the employment sector, 31 teachers (34.8%) worked in public institutions, 26 teachers (29.2%) in private for-profit institutions and 26 teachers (29.2%) in private non-profit institutions. In what concerns the age of the children they worked with, half of the teachers (N = 46, 51.7%) worked with a mixed-age group, while the rest (N = 37, 48.3%) worked with a homogeneous age group. On average, group sizes varied between 8 and 26 children (M = 20.16, SD = 3.92). Of the 89 classrooms that participated in the study, 67 had children with disabilities (75.3%). Classrooms had, on average, 2 children with disabilities (with a confirmed diagnostic or under evaluation) (M = 1.61, SD = 1.30, range 0–6 children).

Measures

Questionnaire *"Facilitating strategies of teacher-child interaction"*

A questionnaire—*"Facilitating Strategies of Teacher-Child Interaction"*—focused on specific strategies fostering the quality of teacher-child relationships was developed. First, a non-systematic literature review was conducted to identify the most used instruments for measuring ECEC quality. In this review, different instruments were considered, including those that assess *process* and *structural quality* features as well as those focused on teacher-child relationships, both at the dyadic-level (e.g., teacher-child relationship) and classroom-level (e.g., classroom environment); varying in nature, such as observational/descriptive, perceptions, beliefs, representations, knowledge, and attitudes; and including instruments considering typical and atypical development.

A literature search was conducted by entering combinations of the keywords or search expressions ("interaction quality" OR "teacher child interaction" OR "teacher-child interaction" OR "interaction" OR "interaction skills" OR "classroom interaction" OR "teacher-child relation*" OR "teacher-child relationship" OR "classroom environment quality" OR "class*" OR "observed interaction*" OR "observed practice*" OR "global quality" OR "structure quality" OR "process quality" OR "classroom organization" OR "instructional support" OR "emotional support" OR "observed relationship*" OR "classroom quality" OR "teaching quality" OR "social interaction" OR "social behavior" OR "social skills" OR "classroom climate" OR "school climate" OR "classroom environment" OR "school environment") AND ("early education" OR "early childhood education" OR "early childhood education and care" OR "ecec" OR "kindergarten" OR "kindergarten*" OR "kinder*" OR "pre-kindergarten" OR "pre-kindergarten" OR "pre-K" OR "pre K" OR "preschool" OR "preschool*" OR "preschool" OR "pre-school" OR "childcare" OR "child care" OR "early

learning center" OR "early learning center" OR "day care" OR "daycare" OR "center-based child care" OR "center-based childcare" OR "center-based programs" OR "center-based setting*" OR "preschooler*" OR "kindergartener*" OR "early years" OR "child development center" OR "child development center" OR "preschool education" OR "nursery school" OR "preschool children" OR "early child care") AND ("assessment" OR "measure" OR "quality measure" OR "evaluation" OR "instrument" OR "scale" OR "observation" OR "interview" OR "questionnaire" OR "self-report") into the Medline, PsycINFO, and Academic Search Premier electronic databases. Before executing the searches, we applied three filters in the search engine: (a) the area filter, which was specified as "education and educational research" to ensure the suitability of the studies found; (b) the date filter, which was set to limit the search to publications from 2012 to 2022 to ensure the timeliness of the studies (to guarantee that they have scientific relevance); and (c) the type of document, as only articles published in scientific journals, and no book chapters, reports or proceedings of conferences, were considered.

A total of 77 articles published in the last 10 years were screened. From those, 45 instruments were identified, which addressed different features of the classroom environment and the quality of teacher-child relationships and interactions in preschool settings. Following previous work (e.g., Aguiar and Aguiar, 2020), three types of classroom quality measures were identified: (1) global quality measures (2 instruments); (2) process quality measures (31 instruments); and (3) content specific measures (12 instruments). The first category of quality measures (for example, ECERS-R; Harms and Clifford, 1980; Harms et al., 1998) provides summary scores looking broadly across different features of quality, including not only teacher-child interactions but also physical features of the educational setting (such as appropriateness of furniture and space for children; availability of play and learning materials), structuring of activities, and features of the environment important for the teachers. Therefore, typically global quality includes both the physical aspects of the environment and the social interactions in the classroom. Process quality measures, also known as interaction-specific measures, which focus primarily on teacher-child interactions, take a major step toward greater specificity by separating different aspects of interactions. A key example is the CLASS (Pianta et al., 2008), which separates Emotional Support and Instructional Support (as well as Classroom Organization). These CLASS summary scores, however, are limited in the extent to which they go the further step of focusing on interactions involving specific content. Examples of content specific measures (or domain-specific measures), that focus on instructional quality within specific content areas (Burchinal et al., 2011), include the Classroom Observation of Early Mathematics (Clements and Sarama, 2008) and the Early Literacy Observation Tool (Grehan and Smith, 2004).

Since our main objective is to evaluate teacher-child interactions strategies, here, we will focus specifically on global measures and process measures. Thirty-three assessment instruments were identified (for a description see **Table 1**).

Next, after identifying the most used assessment instruments (i.e., the most cited in the literature), a content analysis of these assessment tools was conducted by three researchers. Content analysis included a detailed description of the assessment instruments regarding the construct under study and its definition. Based on the content analysis, the dimensions—empirically validated—that would be considered in the questionnaire were defined [(4 dimensions: (1) emotionally responsive interactions, (2) classroom management, (3) attend to children's perspectives, and (4) scaffolding learning] and 70 items (i.e., 70 strategies) were developed (approximately 15–20 items to cover each dimension). As previously explained, there is a need to increase precision in constructs, in the education sciences field, particularly regarding social-emotional aspects (Djamnezhad et al., 2021). Most constructs are umbrella terms that include a range of approaches and concepts. Moreover, within the field of socio-emotional skills, practitioners and researchers use different constructs to organize, define, and describe the research area (Berg et al., 2019). Therefore, throughout this process, an attempt was also made to overlap dimensions that, despite having different labels in the original instruments, assessed similar constructs. In this way, the intention was to simplify the dimensions (and the items that compose the questionnaire), avoid redundancy, and, on the other hand, to make sure that the item represented the dimension.

After being scrutinized by 5 specialists, from the initial 70 items, 22 items (i.e., 22 strategies) were retained in the questionnaire to cover all the dimensions which, according to the literature, facilitate a positive teacher-child relationship and therefore are critical for all children's engagement, learning and development. For each item/strategy, teachers were invited to respond in terms of its desirability and feasibility, based on their experience in implementing the respective strategy on two levels: (a) with the whole group and (b) with the child/children with a disability and/or at risk within the classroom context. The desirability indicates the extent to which teachers considered each strategy relevant and would like to implement it in their professional practice (DESIRABILITY: 1—not desirable at all, 2—somewhat desirable, 3—very desirable, 4—extremely desirable). The feasibility indicates to what extent teachers thought that strategy is feasible to implement in their classroom (FEASIBILITY: 1—not feasible at all, 2—somewhat feasible, 3—very feasible, 4—extremely feasible). Additionally, teachers had to indicate the reason that justified their response to the feasibility scale, at both levels (group and child), out of four options [WHY: (1) knowledge (K), (2) human resources (HR), (3) material resources (MR), and (4) time (T)].

In the following subsections you can find a definition of the 4 dimensions evaluated in the questionnaire.

Dimension 1: Emotionally responsive interactions

With emotionally responsive interactions, teachers provide a caring social environment and are attuned and responsive to the individual cues and needs of students in their classrooms. Teacher-child interactions are warm and close, and there is high proximity through physical contact and affection (e.g., hugs). These relationships are built on trust, respect, and empathy. There is open and affectionate communication (e.g., teachers use a calming voice and a moderate tone), wherein compliments and praise are frequently used. Teachers invest in emotionally supportive environments, providing comfort, reassurance, and encouragement. There is a positive classroom climate reflected in the enthusiasm, enjoyment, and respect displayed during interactions between the teacher and children. Teachers display high sensitivity and responsivity, through consistent, timely, responsive, and contingent responses in their interactions. Highly sensitive teachers help children see adults as a resource and create environments in which children feel welcomed, safe, and free to explore and learn.

In emotionally supportive environments, teachers create a safe place for appropriate expression/management of emotion, and for emotion understanding of self and others. Teachers help children using a warm approach, emotional sensitivity, and encouragement. Teachers are aware of and responsive to the needs of children in their classroom. Overall, teachers and children have positive relationships, enjoy spending time together, and are respectful in their interactions. Some strategies involved in this dimension include: (1) being warm with children through appropriate physical contact (e.g., giving or returning children's hugs); (2) showing respect for children (e.g., waiting for children to complete their questions before answering); (3) when children are upset, hurt or angry, respond with empathy (e.g., making eye contact, listening carefully); (4) value children's positive and negative experiences and feelings (e.g., regardless of the results, valuing the process, saying, for example, *"well done, good try!"*); and (5) to comfort children when they are upset or hurt (e.g., using soothing words when children face adverse situations). An example of an item included in this dimension is *"Use a smile and a pleasant voice when communicating with children (example: using a calming voice)."*

Dimension 2: Classroom management

Classroom management encompasses teachers' practices to engage children and is defined as teacher-child interactions intended to promote positive behavior and prevent or effectively deal with challenging behaviors in the classroom. Therefore, effective classroom management encompasses effective classroom behavior management (i.e., the teacher's use effective methods in their practices to prevent and redirect children's misbehaviors) in creating a well-functioning classroom. Expectations for behavior are clear and consistent (clear rules are defined and used systematically), and teachers are proactive in their approach to managing behavior. Additionally, teachers respond consistently and, whenever possible, preventively to children's behavior. They also use strategies that make children active participants in classroom activities, for instance, providing opportunities to negotiate rules in the classroom.

Teachers encourage social cooperation, providing peer interactions involving mutual support and mutual help (e.g., promoting cooperation activities and joint play). Also, teachers encourage problem solving and conflict resolution, actively involving children in their conflict resolution (e.g., helping children to expose their problems and think about solutions). Teachers encourage the development of social skills by (1) promoting activities for social skills development (e.g., group discussions with children to analyze daily situations) and (2) modeling the development of social skills (e.g., modeling conflict resolution between peers; prompt and reinforce self-calming behaviors when child is upset/dysregulated). Moreover, they support children to develop appropriate social behaviors with peers, so that interactions are characterized by open dialogue, friendship (e.g., supporting children to talk about conflicts instead of fighting). Overall, a set of practices associated with more positive child behavior include: (1) providing clear and consistent behavioral expectations; (2) monitoring the classroom for potential problems and proactively preventing problems rather than being reactive; (3) efficiently redirecting minor misbehavior before it escalates; and (4) using positive, proactive strategies such as praising positive behavior rather than calling attention to misbehavior.

An example of an item included in this dimension is *"React consistently to children's behavior (example: using the same rules systematically)."*

Dimension 3: Attend to children's perspectives

This dimension refers to the degree to which classrooms and interactions are structured around the interests and motivations of the children (vs. the teacher).

When teachers have a high regard for children's perspectives, they frequently ask for children's ideas and thoughts, follow children's lead, and provide opportunities for children to have a formative role in the classroom. In classrooms where teachers have a high regard for children's perspectives, children are not just allowed to talk but are actively encouraged to talk to one another. At the other end of the continuum are classrooms in which teachers follow very scripted plans for how the day should run, show little flexibility or response to children's interests and motivations, and provide few opportunities for children to express their thoughts or to assume responsibility for activities in the classroom. Teachers in these classrooms may also be very controlling of children's movement, requiring, for example, young children to sit quietly on the rug with their

TABLE 1 Assessment measures/instruments used to evaluate ECEC quality by type of quality.

Type of quality	Measures/Instruments
Global	Assessment of Practices in Early Elementary Classrooms (APEEC; Hemmeter et al., 2001)
	Early Childhood Rating Scale (Revised) (ECERS- R; Harms and Clifford, 1980; Harms et al., 1998)
Content specific	Early Language and Literacy Classroom Observation (ELLCO; Castro, 2005)
	Dortmunder Rating Scale (DO-RESI-E-Ki; Fried et al., 2012)
	Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006)
	Perceived Stress Scale-10 (PSS-10; Cohen et al., 1983)
	Creating Caring Children (CCC): 10 open-ended questions (Carlebach and Tate, 2002)
	Peacemaking Skills for Little Kids/Heling not Hurting: Teaching the I-Care Rules Through Literature (PSLK): 21 open-ended questions (Schmidt and Friedman, 1997)
	Video Assessment of Interactions and Learning (VAIL; Pianta et al., 2014)
	The Preschool Classroom Implementation (PCI) Rating Scale (Frede, 1989)
	Specific Teaching Practices II: Supports for Early Literacy Assessment (SELA; (Smith et al., 2001)
	Classroom Language and Literacy Environmental Observation (CLEO; Holland-Coviello, 2005)
	Social-Emotional and Executive Functioning Classroom Observation Tool (SEEF; Upshur et al., 2017)
	I Can Problem Solve (I) dialogue (Shure, 2000; Vestal, 2001)
Process	Classroom Assessment Scoring System (CLASS; Pianta et al., 2008)
	Preschool and Kindergarten Behavior Scales, version 2 (PKBS-2; Merrell, 2003)
	Assessing School Settings: Interactions of Students and Teachers (ASSIST; Rusby et al., 2001)
	Caregiver Interaction Scale (CIS; Arnett, 1989)
	Early Childhood Classroom Observation Measure (ECCOM; Stipek and Byler, 2004)
	Eco-behavioral System for the Complex Assessment of Preschool Environments (ESCAPE; Carta et al., 1992)
	Teaching Styles Rating Scale (TSRS; McWilliam et al., 1998)
	Teaching Style Rating Scale (TSRS; Domitrovich et al., 2007)
	Teacher Behavior Rating Scale (TBRS; Hart and Robinson, 1996)
	CIRCLE Teacher Behavior Rating Scale (CIRCLE TBRS; Landry et al., 2000, 2002)
	Teacher Behavior Rating Scale-P (TBRS-P; Phillips et al., 2018)
	Behavioral Coding System (BCS; Pianta et al., 2020a)
	Multiple Option Observation System for Experimental Studies (MOOSES; Tapp et al., 1995)
	Teacher Coder Impressions Inventory (TCI; Webster-Stratton et al., 2008)
	Classroom Atmosphere Rating Scale (CARS; Conduct Problems Prevention Research Group, 1999)
	Student-Teacher Relationship Scale (STRS; Pianta, 1996)
	Adult-Child Relationship Scale (ACRS; Pianta et al., 1997)
	Teacher-child structured play task (TC-SPT; Whittaker et al., 2018)
	Individualized Classroom Assessment Scoring System (in CLASS; Downer et al., 2010)
	Coping with Children's Negative Emotions Scale (CCNES; Fabes et al., 2002)
	Devereux Early Childhood Assessments (DECA)-Infant–Toddler and Preschool-2nd edition LeBuffe and Naglieri, 2012; Mackrain et al., 2007)
	Emerging Academics Snapshot (EAS) for individual child–teacher interaction (Ritchie et al., 2001)
	Attachment Q-Set (AQS) (Waters, 1990)
	Observational Record of the Caregiving Environment (ORCE) (see Nichd Early Child Care Research Network, 1996)
	Interpersonal Skills Subscale of the Cooper-Farran Behavior Rating Scale (Cooper and Farran, 1991)
	Teacher Observation in Preschool (TOP; Bilbrey et al., 2010)
	Child Observation in Preschool (COP; Farran and Son-Yarbrough, 2001)
	Prekindergarten Classroom Dynamics Rating Scale (Yun et al., 2010)
	Teacher Belief Q-Sort (TBQ) (Rimm-Kaufman et al., 2009)
	Semi-structured play interview (SSPI; Pianta and Hamre, 2001)
	Social Care and Social Work Improvement Scotland (SCSWIS) scales (Bradshaw et al., 2014)

legs crossed and hands in their laps for long periods of time. When teachers attend to children's perspectives, they actively promote children's engagement through their interactions, by (1) providing interesting activities, instruction, centers, and materials and (2) observing children engagement in peer interactions (e.g., observe children while they play). Teachers'

interactions with children and classroom activities place an emphasis on children's interests, motivations, and points of view, rather than being very teacher driven. Teachers are aware of and responsive to the needs of children in their classroom. Teachers show high responsiveness toward children's interests, for instance, identifying when children need additional help or support (e.g., observing children's facial expressions). Teachers listen to children and create opportunities for them to express themselves (e.g., respecting communicational shifts while talking to children). Teachers balance the attention to the child and the group needs, for instance, through classroom organization in small groups, conciliating the response to the child and to the group. An example of an item included in this dimension is *"Adjust the activities to children's interests and points of view (example: observe if children are involved in the proposed activities)."*

Dimension 4: Scaffolding learning

Scaffolding learning involves education-oriented support, discussions and interactions between a teacher and a learner. It is closely connected to Vygotsky's social constructivist view of learning and his concept of Zone of Proximal Development (ZPD, Vygotsky and Cole, 1978) as well as the constructivist learning theories of Dewey (1923), Bruner (1966), and Piaget (1973). Constructivism's central idea is that learning is constructed, and learners develop new knowledge by building on existing knowledge and experiences. According to Vygotsky and Cole (1978) learning takes place within the ZPD, acknowledging the area in which development is still in progress. The ZPD refers to the gap between what children can do by themselves and what they need assistance with, in order to complete a learning task successfully, in a particular moment or period. Children experience success in the ZPD when they receive instructional scaffolding, one of the most suggested, diverse, and powerful constructivist teaching strategies (Clark and Graves, 2005). Thus, the development and learning of a child can occur most effectively within his or her ZPD, the zone between the child's current and potential levels of development (Vygotsky and Cole, 1978). Modeling and scaffolding provided by adults and more competent peers within the ZPD help children solve interpersonal problems, learn new knowledge, and develop social skills, especially in the context of cooperative activities. Using Vygotsky's theory, the teacher can guide children through instructional scaffolding by adjusting the support offered to fit the child's current level of performance (Verenikina, 2008), while recognizing that it is permanently evolving. A constructivist approach promotes a learning environment in which teachers and children collaborate and share their knowledge (Nicaise and Barnes, 1996). Consistent with the concept of the ZPD, teachers observe children's independent activities to support and scaffold their learning and development as needed not by merely correcting them but by guiding and teaching them. From this perspective, teachers play an important role in scaffolding the cognitive and social development of children. Teacher's learning scaffolding is defined as the support teachers provide within children's ZPD to assist their learning and development of new concepts and skills, and examples include teachers' modeling and participation. Thus, scaffolding learning refers to teachers' balance between feedback and autonomy. Teachers take every opportunity to promote children's choice (e.g., encouraging children to choose between two or more play options). Teachers encourage the development of children's progressive autonomy (e.g., supporting the child when he/she takes the initiative to resolve situations), as well as their creativity. Teachers encourage problem solving (e.g., talk through problems as you *"figure out"* a solution). Children are given frequent feedback that expands their understanding of ideas and encourages their continued participation. Teachers and children engage in frequent conversation with one another in ways that help children extend their language and communication skills. An example of an item included in this dimension is *"Maintain a balance between helping children to explore and facilitating children's independent exploration (example: intervening when the child encounters a difficulty and shows signs of withdrawal)"*.

Questionnaire about sociodemographic characteristics and structural early childhood education and care features

Participants were asked to complete some information about themselves (such as age, education and training, years of experience) and about the ECEC setting where they worked in that moment (such as: group size, age of children, number of children with disabilities, type of ECEC institution).

Procedure

Data collection

After a pre-test with 10 teachers, the questionnaire was made available through an online platform (Lime Survey). Preschool teachers were contacted via email and asked to respond to an online questionnaire/survey, which included an informed consent at the beginning. The study was disseminated through the contacts of the researchers, on social networks and using a database previously prepared by the research team with a survey of the different kindergartens that are part of preschool education network in Portugal and their contacts. Data collection took place between November 2020 and March 2021.

Data analyses

The subscale *feasibility regarding the child* was considered for the purpose of testing the psychometric properties of the questionnaire. This attended to the fact that the *desirability* (for the group and for the child) presented reduced data variability.

TABLE 2 Items descriptive statistics of the questionnaire *"Facilitating strategies of teacher-child interaction"*.

	M	*SD*	Skewness	Kurtosis
Emotionally responsive interactions				
Use a smile and a pleasant voice when communicating with children (example: using a calming voice).	3.12	0.892	−0.648	−0.520
Be warm with children through appropriate physical contact (example: giving or returning children's hugs).	3.66	0.646	−1.242	4.639
Show respect for children (example: waiting for children to complete their questions before answering).	3.34	0.801	−1.129	0.836
When children are upset, hurt or angry, respond with empathy (example: making eye contact, listening carefully).	3.23	0.704	−0.570	0.014
Value children's positive and negative experiences and feelings (example: regardless of the results, valuing the process, saying, for example, *"well done, good try!"*).	3.30	0.728	−0.730	−0.40
Comfort children when they are upset or hurt (example: using soothing words when children face adverse situations).	3.58	0.701	−1.813	3.279
Classroom management				
Provide peer interactions involving mutual support and mutual help (example: promoting cooperation activities and joint play).	3.22	0.766	−0.560	−0.530
React consistently to children's behavior (example: using the same rules systematically).	3.23	0.754	−0.583	−0.419
Actively involve children in their conflict resolution (example: helping children to expose their problems and think about solutions).	2.99	0.819	−0.524	−0.141
Promote activities for social skills development (example: group discussions with children to analyze daily situations).	3.04	0.803	−0.211	−1.036
Model the development of social skills (example: modeling conflict resolution between peers).	2.95	0.795	−0.212	−0.692
Support children to develop appropriate social behaviors with peers (example: supporting children to talk about conflicts instead of fighting).	2.95	0.882	−0.451	−0.549
Provide opportunities to negotiate rules in the classroom (example: encouraging children's participation in rules definition).	3.06	0.860	−0.353	−1.005
Attend to children's perspectives				
Identify when children need additional help or support (example: observing children's facial expressions).	3.10	0.759	−0.507	−0.099
Adjust the activities to children's interests and points of view (example: observe if children are involved in the proposed activities.	3.11	0.716	−0.367	−0.280
Observe children engagement in peer interactions (example: observe children while they play).	3.12	0.817	−0.365	−1.030
Listen to children and create opportunities for them to express themselves (example: respecting communicational shifts while talking to children).	3.04	0.862	−0.656	−0.130
Balance the attention to the child and the group needs (example: conciliating the response to the child and to the group)	2.78	0.812	−0.139	−0.539
Scaffolding learning				
Take every opportunity to promote children's choice (example: encouraging children to choose between two or more play options).	3.13	0.852	−0.623	−0.449
Encourage the development of children's progressive autonomy (example: supporting the child when he/she takes the initiative to resolve situations).	3.20	0.823	−0.804	0.042
Maintain a balance between helping children to explore and facilitating children's independent exploration (example: intervening when the child encounters a difficulty and shows signs of withdrawal).	2.98	0.780	−0.115	−0.942
Encourage problem solving (example: talk through problems as you "figure out" a solution).	3.19	0.756	−0.685	0.163

Prior to analyses, the subscale *feasibility regarding the child level* was examined for the normality of each of the 22 items, revealing that none of the items were higher than the recommended cut-off points—skewness |2.00|and, kurtosis |7.00|(Kline, 1998; **Table 2**).

A confirmatory factor analysis (CFA) was conducted using AMOS 28.0 to assess the *Facilitating Strategies of Teacher-Child Interaction* Questionnaire factor structure as well as the convergent validity of the factors (Byrne, 2001). This intended to test the fit of the proposed Questionnaire and the defensibility of its four-structure factors. Multiple goodness-of-fit indices pertaining to different fit classes, as recommended by several authors (Jaccard and Wan, 1996; Brown, 2015) were used, including: (i) as absolute fit indices, the standardized root mean square residual (SRMR)—expecting to obtain values close to zero as possible; the root mean square error of approximation (RMSEA)—values near or below 0.06 indicate close fit; (ii) as comparative fit index, the comparative fit index (CFI)—indicating an acceptable model with values higher than 0.90; (iii) as parsimony fit index, the PCFI with values greater 0.70 suggesting an acceptable fit.

Findings show that data obtained with the *Questionnaire*—sub-scale *feasibility regarding the child* present good fit indices (χ^2/df = 1.341; RMSEA = 0.064; SRMR = 0.0637; CFI = 0.935; PCFI = 0.822). All indicators loaded substantively (standardized coefficient > 0.5) and significantly ($p < 0.05$) on their respective dimensions; the composite reliability (CR)

TABLE 3 Construct validity of the questionnaire *"Facilitating strategies of teacher-child interaction"*.

	Feasibility	
	Composite reliability	**Average variance extracted**
Emotionally responsive interactions	0.83	0.54
Classroom management	0.91	0.58
Attend to children's perspectives	0.89	0.61
Scaffolding learning	0.85	0.59

and average variance extracted (AVE) are presented in **Table 3**, indicating acceptable values by considering the recommended thresholds of CR > 0.70 and AVE > 0.50 (Fornell and Larcker, 1981). This provides evidence of convergent validity (CR) and discriminant validity (AVE) of both scales of desirability and feasibility.

At this point, the reliability of items within each factor (indicating the degree to which those items are indexes of the latent factor) for the four sub-scales were examined, using the recommended threshold that values should be greater than 0.70 (**Table 4**). Values were found to range from 0.736 to 0.906, thus providing evidence of the internal reliability of all the sub-scales for the four dimensions under analysis.

To answer to the main research questions descriptive analyses and group comparisons were conducted, as described in the Results' section. To carry out the mean difference tests, the assumptions of normality and homogeneity of variances were tested. The significance level of $p < 0.05$ was assumed for analyses. Effect sizes were computed. The magnitude of the effects was interpreted in accordance with Cohen's guidelines (Cohen, 1992).

Results

Research question 1: According to early childhood education and care teachers, how desirable and feasible is a set of strategies to promote group engagement and the engagement of children with disabilities?

Overall, teachers considered all four dimensions important, with a high *desirability* mean score in all dimensions (above 3.68), at both levels (i.e., for both the *child* and the *group*). Rating of *feasibility* were lower than for *desirability*. The dimension *Emotionally Responsive Interactions* registered the higher score and the dimension *Attend to Children's Perspectives* the lower score on the *feasibility* scale.

TABLE 4 Reliability of the four-dimensional model.

	Child		Group	
Dimensions	**Desirability**	**Feasibility**	**Desirability**	**Feasibility**
Emotionally responsive interactions	0.823	0.826	0.810	0.783
Classroom management	0.905	0.906	0.839	0.845
Attend to children's perspectives	0.868	0.883	0.851	0.803
Scaffolding learning	0.852	0.850	0.777	0.736

Research question 2: Are there differences between early childhood education and care teachers' desirability and feasibility ratings at the child and group levels?

The means (*M*), standard deviations (*SD*), paired *t*-test results (*t*), Cohen's-d (*d*) between the sub-scales *desirability* and *feasibility* for all the four dimensions are presented in **Table 5**.

Paired-sample t-tests showed that there were significant differences between teachers' perception of *desirability* and *feasibility* for the total scale and the four dimensions, both when implementing strategies at the *child* and *group* levels. ECEC teachers assessed the *desirability* of classroom strategies higher than *feasibility*. The effect size evaluated with Cohen's d was small to moderate in *Emotionally Responsive Interactions* dimension ($d_{child} = 0.380$, $d_{group} = 0.297$) and moderate in *Classroom Management* ($d_{child} = 0.659$, $d_{group} = 0.428$), *Attend to Children's Perspectives* ($d_{child} = 0.642$, $d_{group} = 0.526$) and *Scaffolding Learning* ($d_{child} = 0.673$, $d_{group} = 0.403$). Overall, the mean difference between *desirability* and *feasibility* registered higher effect size at the *child*'s level than at the *group's* level.

A repeated measures ANOVA was used to ascertain the differences between the dimensions under analysis and conclude on the training needs of ECEC teachers. The dependent variables were the mean difference between *desirability* and *feasibility* in each dimension. The higher the mean difference, the higher the ECEC teachers' necessity. There was an overall significant difference between the mean difference (*Desirability—Feasibility)* in each dimension [child's level: $F(3, 246) = 16.337$, $p < 0.001$, $\eta_p^2 = 0.166$; group's level: $F(2.677, 232.933) = 11.930$, $p < 0.001$, $\eta_p^2 = 0.121$].

The *Bonferroni multiple comparisons* analysis revealed that the *mean difference* in the dimension *Emotionally Responsive Interactions* was significantly lower than in the dimensions for both *child* (*Classroom Management* $p < 0.001$; *Attend to Children's Perspectives* $p < 0.001$; *Scaffolding Learning* $p < 0.001$)

TABLE 5 Comparisons between ECEC teachers' *desirability* and *feasibility* ratings for the four dimensions at the child and group levels.

	For the child								For the group							
	Desirability		Feasibility		Mean difference				Desirability		Feasibility		Mean difference			
Factors	*M*	*SD*	*M*	*SD*	*Dif*	*t*	*p*	*d*-Cohen	*M*	*SD*	*M*	*SD*	*Dif*	*t*	*p*	*d*-Cohen
Emotionally responsive interactions	3.67	0.47	3.35	0.55	0.31	7.414	<0.001	0.380	3.83	0.29	3.57	0.36	0.26	8.142	<0.001	0.297
Classroom management	3.70	0.49	3.06	0.65	0.65	8.947	<0.001	0.659	3.78	0.34	3.39	0.46	0.39	8.509	<0.001	0.428
Attend to children's perspectives	3.68	0.51	3.03	0.66	0.65	9.271	<0.001	0.642	3.78	0.37	3.27	0.50	0.51	9.038	<0.001	0.526
Scaffolding learning	3.68	0.51	3.13	0.68	0.55	7.417	<0.001	0.673	3.80	0.32	3.45	0.41	0.36	8.405	<0.001	0.403
Total scale	3.68	0.46	3.14	0.55	0.52	9.593	<0.001	0.513	3.80	0.29	3.42	0.36	0.38	10.269	<0.001	0.346

TABLE 6 Percentage of responses per dimension.

		No. items	Knowledge (*n*, %)	Human resources (*n*, %)	Material resources (*n*, %)	Time (*n*, %)
Child's level	Emotionally responsive interactions	6	263 (52.60)	68 (13.60)	67 (13.40)	102 (20.40)
	Classroom management	7	329 (56.63)	91 (15.66)	61 (10.50)	100 (17.21)
	Attend to children's perspectives	5	174 (41.93)	86 (20.72)	54 (13.01)	101 (24.34)
	Scaffolding learning	4	156 (47.13)	71 (21.45)	45 (13.60)	59 (17.82)
Group's level	Emotionally responsive interactions	6	284 (54.30)	61 (11.66)	53 (10.13)	125 (23.90)
	Classroom management	7	303(49.84)	63 (10.36)	70 (11.51)	172 (28.29)
	Attend to children's perspectives	5	182 (41.74)	76 (17.43)	49 (11.24)	129 (29.59)
	Scaffolding learning	4	175 (50.43)	52 (14.99)	42 (12.10)	78 (22.48)

and *group* (*Classroom Management* $p = 0.006$; *Attend to Children's Perspectives* $p < 0.001$; *Scaffolding Learning* $p = 0.026$) levels. Furthermore, at the *group*'s level, the *mean difference* in the dimension *Attend to Children's Perspectives* was significantly higher than in *Scaffolding Learning* ($p = 0.003$).

Research question 3: What reasons do teachers attribute to the feasibility of strategies to use with the group and the child with disability?

ECEC teachers identified the reasons for their response to the feasibility scale in each item. The frequency of those reasons was computed for each dimension. Table 6 displays the frequency and percentage assigned to each reason by ECEC teachers.

When analyzing ECEC teachers' reasons for their responses on the *Feasibility* of teacher-interaction strategies at the groups' level, having *knowledge* emerged as the most prominent reason for all the dimensions, followed by having *time* and *material resources*. These results are similar for the child's level, except for the reasons *time* and *human resources*, which were, respectively, the third and second most evoked to justify the *feasibility* of the dimension *Scaffolding Learning*. Regarding this dimension, this is the only both at child and group's levels that the need for *time and human resources* overcomes the need for having *knowledge*.

Research question 4: Do individual (e.g., years of teaching experience) and contextual (e.g., number of children per classroom) variables influence the scores that teachers assign to the desirability and feasibility engagement strategies for the group and the child with disabilities?

Table 7 shows the variables that influence the perception of feasibility in implementing strategies in the classroom, with statistical significance. Surprisingly, individual variables (such as age, professional development) and context variables (such as the total number of children and the number of children with disabilities in the class) were not significantly associated with ECEC teachers' perception of *feasibility* of key dimensions of high-quality teacher-child interaction. On the other hand, ECEC teachers' years of experience, overall satisfaction with student development and the type of institution at which they teach made difference on their perception of *feasibility*. In particular, when comparing to teachers with 10–20 years of

TABLE 7 Individual and contextual variables significantly associated with the *feasibility* of each dimension at the child and group's levels.

Child's level	*N*	Emotionally responsive interactions				Classroom management				Attend to children's perspectives				Scaffolding learning			
		M	*DP*	*t/F/r*	*p*	*M*	*DP*	*t/F/r*	*p*	*M*	*DP*	*t/F/r*	*p*	*M*	*DP*	*t/F/r*	*p*
Years of experience (*t*)																	
10–20 years	25	3.187	0.487			2.897	0.535			2.800	0.428			3.020	0.590		
>20 years	53	3.390	0.572	−1.534	0.129	3.108	0.674	−1.371	0.174	3.102	0.699	−2.346	**0.022**	3.151	0.699	−0.809	0.421
Satisfaction with the development level of the group (*r*)				0.166	0.149			0.311	**0.006**			0.091	0.432			0.176	0.126
Type of school																	
Public	30	3.522	0.408			3.229	0.589			3.147	0.650			3.217	0.685		
Private	24	3.160	0.649			2.839	0.737			2.817	0.760			3.000	0.711		
Semi-public	23	3.370	0.534	**3.121**	**0.050**	3.099	0.574	2.546	0.085	3.044	0.536	1.724	0.186	3.152	0.606	0.713	0.493
Group's level	***N***	**Emotionally responsive interactions**				**Classroom management**								**Scaffolding learning**			
		M	*DP*	*t/F/r*	*p*	*M*	*DP*	*t/F/r*	*p*	*M*	*DP*	*t/F/r*	*p*	*M*	*DP*	*t/F/r*	*p*
Years of experience (*r*)																	
10–20 years	27	3.426	0.353			3.169	0.429			3.030	0.371			3.352	0.423		
>20 years	55	3.621	0.351	**−2.365**	**0.020**	3.491	0.420	**−3.235**	**0.002**	3.353	0.511	**−3.258**	**0.002**	3.482	0.399	−1.358	0.178
Satisfaction with the development level of the group (*r*)				0.186	0.093			**0.268**	**0.015**			0.203	0.067			0.191	0.086
Type of school																	
Public	30	3.661	0.343			3.538	0.405			3.333	0.496			3.467	0.458		
Private	26	3.487	0.371			3.214	0.516			3.108	0.583			3.375	0.443		
Semi-public	26	3.564	0.359	1.669	0.195	3.401	0.404	**3.728**	**0.028**	3.315	0.404	1.687	0.192	3.481	0.323	0.505	0.605

Bold indicates statistical significance ($p < 0.05$).

experience, teachers with more than 20 years of experience rated significantly higher the feasibility of *Attend to Children's Perspectives* [$t(70.703) = -2.346$, $p = 0.022$, $d = 0.626$] at the child's level and the *feasibility* of *Emotionally Responsive Interactions* [$t(80) = -2.365$, $p = 0.020$, $d = 0.351$], *Classroom Management* [$t(80) = -3.235$, $p = 0.002$, $d = 0.423$], *Attend to Children's Perspectives* [$t(80) = -3.258$, $p = 0.002$, $d = 0.470$] and, at the group' level. Notably, it was found that the degree of teachers' satisfaction with the development of their children had a positive significant correlation with the *Feasibility* for implementing strategies to *Classroom Management* in both child ($r = 0.311$, $p = 0.006$) and group's ($r = 0.268$, $p = 0.015$) levels. The type of educational institution was also found to be associated with teachers' perception of *feasibility*. The one-way analysis of variance revealed that teachers teaching in private institution registered significantly lower scores on the *feasibility* on strategies related to *Emotionally Responsive Interactions* [$F(2, 74) = 3.121$, $p = 0.050$, $\eta_p^2 = 0.078$] at child's level and to *Classroom Management* [$F(2, 79) = 3.728$, $p = 0.028$, $\eta_p^2 = 0.086$] at group's level.

Discussion

The aim of this study was to evaluate preschool teachers' opinions about the *desirability* and *feasibility* of a set of strategies, empirically validated, to increment teacher-child interactions in ECEC classrooms, for the group and

the child/children with disabilities (within the group). For this purpose, a questionnaire, called *"Facilitating Strategies of Teacher-Child Interaction,"* focused on specific strategies to promote the quality of teacher-child relationships, was developed. This questionnaire, based on a non-systematic literature review of the most used assessment instruments to measure ECEC classroom quality, lists 22 strategies, which according to the literature, are considered the most effective for teacher-child interactions quality, organized in 4 dimensions: (1) *emotionally supportive interactions*, (2) *classroom management*, (3) *attend to children's perspectives*, and (4) *scaffolding learning*. Regarding the results, our questionnaire showed good fit indices and confirmed the factorial structure of the questionnaire in these four factors (dimensions), which makes it an instrument that can be used by others interested in studying teachers' professional development needs, regarding their knowledge and practices.

In relation to the dimensions included in the questionnaire, in classrooms high on *emotionally responsive interactions*, teachers provide a caring social environment and are attuned and responsive to the individual cues and needs of students in their classrooms. Teacher-child interactions are warm and close, and there is high proximity between them, for instance, through physical contact. The *classroom management* dimension encompasses teachers' abilities to engage children and is defined as teacher-child interactions intended to promote positive behavior and prevent or terminate misbehavior in the classroom (e.g., providing clear and consistent behavioral expectations, monitoring the classroom for potential problems, and proactively preventing problems rather than being reactive). The dimension *attend to children's perspectives* refers to the degree to which classrooms and interactions are structured around the interests and motivations of the children. When teachers have a high regard for children's perspectives, they frequently ask for children's ideas and thoughts, follow children's lead, and provide opportunities for children to have a formative role in the classroom. At last, teacher's *learning scaffolding* is defined as the support teachers provide within children's ZPD to assist their learning and development of new concepts and skills, and examples include teachers' modeling and participation. Thus, scaffolding learning refers to teachers' balance between feedback and autonomy. Teachers take every opportunity to promote children's choice (e.g., encouraging children to choose between two or more play options). Teachers encourage the development of children's progressive autonomy (example: supporting the child when he/she takes the initiative to resolve situations), as well as their creativity. Teachers encourage problem solving (e.g., talk through problems as you *"figure out"* a solution). Children are given frequent feedback that expands their understanding of ideas and encourages their continued participation. Teachers and children engage in frequent conversation with one another in ways that help children extend their language and communication skills.

Knowing the opinions and perceived needs of teachers, the main actors in preschool settings, in particular the importance assigned, and the feasibility of teacher-child interaction strategies is a critical factor for improving ECEC setting quality. The results revealed that, when asked about the strategies *desirability*, which basically represents the state-of-the-art knowledge, as expected, teachers considered all 4 dimensions important, with a high *desirability* mean score in all dimensions, at both levels (i.e., for both the *child* and the *group*). Moreover, ECEC teachers, when evaluating strategies for improving teacher-child interaction quality, scored significantly higher in the *desirability* subscale compared with the *feasibility* subscale (in all dimensions and at both the *child* and the *group* level). This gap between teachers' perceived desirability and feasibility to implement strategies fostering teacher-child interaction quality provides important insights for policymakers, academics, higher education institutions and schools about: (1) what dimensions are important to reinforce in ECEC teachers education and professional development; (2) the need to formulate guidelines for high quality practices in ECEC settings; (3) the need to further investigate conditions for improving ECEC high quality practices, and (4) how school routines should incorporate opportunities for professional development through supportive processes of collaboration between ECEC teachers. Related to this latter aspect, Hamre et al. (2017) highlighted the need to strengthen local programs to effectively support preschool teachers professional development. Different studies have been demonstrating the effectiveness of coaching/modeling (e.g., video feedback, guided practice), listening to teachers, promoting teachers reflective functioning (e.g., Hemmeter et al., 2015; Pianta et al., 2017).

Overall, the mean difference between the *desirability* and *feasibility* subscales registered a higher effect size at the *child*'s level than at the *group*'s level, meaning that it seems to be more difficult to use these strategies when focusing on a child or a subgroup of children with disabilities compared to the whole group, confirming that the inclusion of children with disabilities in preschool settings remains a challenge (Zabeli and Gjelaj, 2020). Challenges are often reported to be related to teacher preparedness to respond to more complex needs presented by children with disabilities raising concerns regarding the provision of supports to individual children in the preschool. Hau et al. (2020), in a study about preschool teachers' perspective on the inclusive processes, questioned whether the goals of inclusion, such as participation, engagement and learning are being fulfilled for all children. The authors found that the focus of teachers' attention was on the group-related processes when compared to individual-related processes. In our study, the higher degree of teacher's needs (mean difference between desirability and feasibility) allocated at the child's level may also reflect that.

A more detailed analysis of the results revealed that when comparing the mean difference between *desirability* and

feasibility across dimensions, the effect size was small to moderate in *Emotionally Responsive Interactions* dimension and moderate in the remaining domains (*Classroom Management*, *Attend to Children's Perspectives* and *Scaffolding Learning)* for both *child* and *group* levels. Therefore, strategies related to the *Emotionally Responsive Interactions* dimension seem to be less needed, in the sense that teachers seem to consider them more feasible/easier to implement. These results are aligned with previous studies stating that among different self-identified dimensions or domains of improvement, emotional support is the less evoked by ECEC teachers (Block et al., 2019). The other dimensions comprise specific instructional supports basic to promoting students learning and developing and, thus more connected with acquired knowledge throughout initial and continuing professional education. In turn, *Emotionally Responsive Interactions* (i.e., being warm, respectful, and supportive) may be both the most tangible aspect of competence for teachers and an individual characteristic pertaining to their repertoire and therefore, more easily identified in themselves and more easily implemented in classroom.

Furthermore, at the *group*'s level, the *mean difference* in the dimension *Attend to Children's Perspectives* was significantly higher than in the *Scaffolding Learning* dimension. When teachers are faced with group-level diversity, they find it more difficult to respond to children's perspectives, which is not so when it comes to meeting the specific needs or perspectives of a child or subgroup of children with disabilities [most of the time, the teacher has additional help in the classroom, for instance, through the presence of a special education teacher, to meet the needs of the child(ren) with disabilities].

The reasons provided by teachers to explain the difficulty in the feasibility of certain strategies were analyzed. The results show that across all dimensions, the main reason teachers give for the difficulty in feasibility, both at the group and child's level, is knowledge. In this case, lack of knowledge. These results are congruent with those of previous studies that point knowledge as one of the most requested resources to improve preschool teachers' practices (e.g., Hamre et al., 2012; Zabeli and Gjelaj, 2020). It is commonly held that teachers' knowledge of ECEC is a fundamental factor determining the quality of a classroom with impact on children's learning and development (Slutsky and Pistorova, 2010; Zaslow et al., 2010).

Accordingly, the second most important reason to explain the difficulty in implementing teacher-interaction strategies is time. In this study, this reason can be related to having enough time to spend on the children under supervision or to having time to plan, document and analyze—for the whole group or attending to a particular child. OECD (Taguma et al., 2012) referred to time as an important quality factor in promoting teacher-child interactions.

Then, we analyzed the relationship between teachers' responses to the questionnaire and individual and contextual variables, and we found statistically significant results between the *feasibility* sub-scale at the group level, and the socio-demographic variables of *years of experience*, *type of school* and *teacher's satisfaction with the development level of the group*.

Regarding the variable *years of experience*, we found statistically significant differences for the feasibility subscale at the group level in 3 dimensions (all dimensions except for *scaffolding learning*). We found that the mean *feasibility* for the 3 dimensions is statistically significant higher for teachers with more than 20 years of experience (vs. teachers with between 10 and 20 years of experience). Thus, teachers with more years of service find the use of *emotional supportive interactions*, *classroom management* and *attend to children's perspectives* strategies more feasible. Professional experience is reflected in *feasibility*, that is, in knowing how to do it. This result shows the importance that experience can have in incorporating these strategies into the daily routine of interactions. This study did not assess this aspect, but in other studies, learning from experience and from other colleagues is pointed out as a reason for change (Vieira-Rodrigues and Sanches-Ferreira, 2017).

Regarding the variable *type of school*, we found statistically significant differences for the *feasibility* subscale at the *group* level only for one dimension, that of *classroom management*. In particular, the results show that the average *feasibility* of strategies related to this dimension is lower for private educational institutions than for public institutions and semi-public schools. In private institutions, classrooms may have more children (i.e., higher staff/child ratio) and teachers may be younger (i.e., have less experience), which has a particular impact on such a training/experience-dependent dimension as is the case of *classroom management*. Regarding the variable *teacher's satisfaction with the development level of the group*, the results show significant differences for the subscale of *feasibility* at the child and group's level for the dimension *classroom*. In particular, the results show that the average *feasibility* of strategies related to this dimension is higher for teachers who are more satisfied with the development level of the group. If we consider that when teacher's satisfaction with the development level of the group is high, it means that they consider the strategies used effective, and if we consider that these strategies were recognized as desirable by all, then we can conclude that the satisfaction with development level of the group can also result in greater feasibility of implementation.

Conclusion and implications for teacher education

This study shows a large gap between teachers' perspectives on the importance and feasibility of process quality strategies (facilitators of teacher-child interactions) to be used in early childhood inclusion classrooms. Understanding the reasons teachers attribute to the difference between the strategies

desirability and *feasibility* informs the assessment of teacher education needs and might be operationalized as a new observation grid. These aspects are input to teachers' education and professional development that are both effective and efficient. By evaluating the difference between the *desirability* and *feasibility* of these strategies implementation (as well as the reasons that teachers attribute to these differences), we address the need to develop and implement practical and explicit pedagogical strategies that (1) will respond directly to teachers' difficulties/limitations—"*strategies that are important but hard-to-do*", (2) are built on teachers' current knowledge and expertise, (3) are embedded into their daily practice and can be used in a daily basis effectively (i.e., making it a feasible practice), and (4) are tailored to the social, emotional, and behavioral needs of the child as well as the child within the group.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not provided for this study on human participants because the study followed with ethical procedures as explained in the method section. The patients/participants provided their written informed consent to participate in this study.

Author contributions

MS-F and JG: conceptualization, study design, data collection, data analysis, and article writing. SBA: data collection, article editing, and revision. SA: data collection, data analysis, and article writing. SB: data collection and editing and revision of the article. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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