

## Measuring What Matters in Early Childhood Classrooms: A Focus on Teacher-Child Interactions

### Cómo medir lo que importa en las aulas de primera infancia: un enfoque sobre las interacciones educadora-niño

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#### Abstract

This article summarizes recent trends in early childhood education and the role of teacher-child interactions, and also expands upon one particular framework that has helped the field advance in understanding this key component. Motivation for this summary comes from a growing body of international research, including some studies in Latin America, that indicate that investment in early childhood education can reap significant benefits for children and their communities. Latin America has made significant efforts to increase early childhood education; however, access does not appear to be sufficient to ensure adequate outcomes for children's learning and development. The growing evidence base points to the quality of the experience within the classroom, and specifically to the quality of teacher-child interactions, as critically necessary in order to maximize children's development and learning. The Teaching Through Interactions Framework provides a useful approach to understanding the nature of classroom interactions, as well as initial evidence that professional development can enhance such interactions. Based on this summary of the current state of affairs, this article then offers recommendations for early childhood education.

**Keywords:** early childhood education, teacher-child interactions, measurement

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## Resumen

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El presente artículo resume tendencias recientes en la educación durante la primera infancia y con respecto al papel de las interacciones educadora-niño; además, entrega mayores detalles sobre un marco específico que ha ayudado a que este campo de estudio avance en su comprensión de este componente clave. La motivación para realizar este resumen surge de un cuerpo de investigación internacional creciente, incluyendo algunos estudios en Latinoamérica, que indica que invertir en la educación durante la primera infancia puede entregar beneficios significativos a los niños y sus comunidades. América Latina ha realizado esfuerzos significativos para aumentar la educación en la primera infancia; sin embargo, el acceso parece no ser suficiente para asegurar resultados adecuados para el aprendizaje y desarrollo de los niños. Una masa de evidencia cada vez mayor indica que la calidad de las experiencias dentro del aula, y específicamente la calidad de las interacciones educadora-niño, son esenciales para maximizar el desarrollo y el aprendizaje infantil. El Marco de Enseñanza Mediante Interacciones [Teaching Through Interactions Framework (TTIF)] entrega un enfoque útil para comprender la naturaleza de las interacciones en el aula, además de proveer evidencia inicial de que el desarrollo profesional puede fortalecer dichas interacciones. Sobre la base de la situación actual, el presente artículo luego ofrece recomendaciones para la educación en la infancia temprana.

**Palabras clave:** educación en la primera infancia, interacciones educadora-niño, medición

In light of the importance of high-quality early experiences for children's short- and long-term development, stakeholders are looking to expand children's access to early school experiences. Without attention to quality, however, these investments may not result in the kinds of experiences that will matter. This article summarizes recent trends in early childhood education and the role that teacher-child interactions play as one key component. Papers were selected to provide a range of high-quality field research examples from around the world to highlight trends and generate ideas about next steps. Thus, they are not intended to represent a comprehensive review of the topic but, rather, a window into this particular aspect of classrooms. To do this, we first provide brief background information on early childhood education as a potential avenue for improving children's outcomes and a brief overview of access and quality in Latin America. The second section then reviews examples of evidence that the impact of early childhood education is dependent on the quality of the experience and articulates one approach to understanding the nature of classroom interactions: the Teaching Through Interactions Framework (TTIF). The cases presented include a range of well-conducted studies published in peer-reviewed journals. We then discuss what we have learned about the standardized measurement of these interactions and how measurements have been used to improve teacher-child interactions in professional development interventions. Finally, we offer recommendations for the field to consider.

### Early childhood education as a promising avenue of investment

Although different systems and countries use varying terms to describe early childhood education, in this paper, we will use the term to encompass research about organized school experiences serving children approximately 3 to 6 years old. A growing body of international research indicates that investment in early childhood education can reap significant benefits for children and their communities. This research began in the United States in the 1960s with the High Scope/Perry Preschool Project and the Carolina Abecedarian Project, both of which demonstrated that children randomly assigned to structured early childhood education achieved better life outcomes well into adulthood (Ramey, 1974; Ramey & Campbell, 1984; Schweinhart, 1993). Similar results pointing to the benefits of early education have been documented across Europe, Asia, Australia, and Latin America (Boocock, 1995; Braithwaite, 1983; McMahan, 1992; Nitta & Nagano, 1975).

Several large-scale, well-controlled studies in Latin America are worth expanding on here. For example, Argentina implemented a large program to expand coverage of pre-primary education in the late 1990s. Participating children performed better on mathematics and Spanish achievement tests in third grade, and demonstrated higher participation skills and discipline, as reported by their teachers (Berlinski, Galiani, & Gertler, 2009). In another study in Uruguay, pre-primary school attendance for children aged

4 and 5 years old resulted in a significant, positive effect on the number of years of schooling completed (Berlinski, Galiani, & Manacorda 2008). And, most recently in Latin America, a study examining the impact of Chile's public early childhood education program on fourth-grade academic achievement (Cortázar, 2015) found that, after controlling for socio-demographic factors, participating in a public early childhood program was positively correlated to achievement in mathematics, reading, and the social sciences. Thus, early childhood education research, both globally and in Latin America, specifically suggests that early childhood education is a promising agent of change for children.

Goals for early childhood education include closing poverty gaps and educational disadvantages by increasing women's involvement in the labor force, as well as improving children's well-being and learning (OECD, 2006). Due to the noted benefits of early childhood education, many governments and non-profit organizations are dedicating time, money, and effort to increasing early childhood education participation, and Latin America is no exception. In general, young children in the Latin American and Caribbean region attend school. In almost every country in the region, including the poorest ones, school attendance for children 6 to 9 years old is universal, and has been so since the early 2000s. Many countries in the region have made a push to extend the coverage for 5-year-olds and, in these countries, the proportion of 5-year-olds attending school in 2014 was about 80% (Berlinski & Schady, 2015).

Numerous international studies, however, have also demonstrated that enrollment in early childhood education alone is not enough to promote positive outcomes. For example, in a study by Rosero and Oosterbeck (2011) on the impact of preschool attendance for 2,572 children from low-income families in Ecuador, they found that attendance at center-based care was detrimental to both children's cognitive development and their mothers' mental health. In another study, Arredondo et al. (2011) evaluated a Mexican program called «Estancias Infantiles para Apoyar a Madres Trabajadoras,» [«Childcare in Support of Working Mothers»] designed to promote labor force participation of mothers with young children by providing them with subsidies for early childhood education. The authors found that while preschool provision and subsidies were effective in increasing mothers' workforce participation, the majority of children in the program showed no significant cognitive or health effects as a result of their participation (Arredondo et al., 2011). As another example, Baker, Gruber, and Milligan (2008) found that, in a study of the universal expansion of government-subsidized preschool in Canada, increased exposure to preschool also increased child «hyperactivity, inattention, aggressiveness, motor/social skills, child health status, and illness» (p. 6). Thus, although studies have demonstrated benefits for children attending specific early childhood programs, others indicate that simply increasing early education access does not appear to be sufficient to ensure adequate learning and development for children.

### **What accounts for children's different outcomes resulting from early education?**

A longitudinal childcare study conducted by the National Institute of Child Health and Human Development (NICHD) in the United States sheds some light on factors that might account for differences in children's outcomes resulting from early childhood education enrollment. The NICHD Study of Early Child Care and Youth Development (SECCYD) was initiated in 1989 to examine associations between early childhood experiences and developmental outcomes among approximately 1,300 children across the country. From this study, it became evident that the quality of care, beyond basic access, was associated with children's outcomes. For example, the number of standards an early childhood center met (e.g., teacher-child ratio, staff training) was directly related to children's gains in development (National Institute of Child Health and Human Development [NICHD], 1999a). Subsequent analyses point to another key aspect of quality: warm, responsive, and stimulating teacher-child interactions (Barnett, 2011; NICHD, Early Child Care Research Network, 1999a, 1999b, 2000). Children receiving care characterized by high-quality teacher-child interactions showed better language and social skills concurrently (Pianta & Stuhlman, 2004; Yoshikawa et al., 2013), as well as later in life (Barnett, 2003, 2011). Children enrolled in low-quality early childhood education, however, barely outperform their counterparts who do not receive formal early childhood education (NICHD, 1999a).

The studies presented so far indicate that the quality of children's classroom experiences affect the degree to which they benefit from early childhood education and begin to hint at the aspects of quality that account for these differences. Classroom quality is complex, but it can be separated into two broad facets: structural and process quality. Structural quality focuses on features of the classroom experience,

such as the environment, the nature and level of teacher training and experience, the adoption of certain curricula, class size, and teacher-child ratio-features often thought of as being easy to measure and therefore best regulated through policy. Process quality, on the other hand, refers to children's direct interactions with resources and opportunities in the classroom, including elements of program design; for example, the ways teachers implement activities and lessons, the nature and quality of interactions between adults and children, and the availability of certain types of activities.

In recent years, teacher-child interactions in particular have received attention as a promising element of quality that is both malleable and associated with improved child outcomes. While process quality variables, like teacher-child interactions, are potentially more challenging to measure than structural features, studies suggest that they uniquely contribute to children's learning and development. For example, in a large-scale study of state-funded preschool classrooms in the United States, findings indicated that teacher-child interactions were associated with academic and socio-emotional gains beyond the effects of program design, infrastructure, and a global measure of quality (Mashburn et al., 2008). Subsequent research has shown that even when classrooms meet all structural standards for quality, the extent of variation in observed process quality and in children's outcomes is considerable (NICHD, 2002; Pianta et al., 2005; Pianta, La Paro, Payne, Cox, & Bradley, 2002). Thus, structural classroom features do not appear sufficient alone to ensure children's development and learning.

### **Interactions that support children's development**

In response to these findings, administrators of early childhood programs are increasingly looking to teacher-child interactions in their efforts to promote quality. Developmental research shows that children learn and develop as a consequence of their interactions with adults and peers and that these interactions can help shape children's brain architecture in ways that have lifelong implications (Fox, Levitt, & Nelson, 2010). When adults are sensitive and responsive to children's cues and needs, children learn and develop (Center on the Developing Child at Harvard University, 2012). As children enter more formal classroom settings, interactions with teachers and their peers begin to play a critical role in development.

Building off of previous descriptions of quality teaching (Brophy & Good, 1974; Eccles & Roeser, 2005), the TTIF (Hamre & Pianta, 2007) has become a widely-used model for understanding and measuring teacher-child interaction quality and is aligned with an observation tool, the Classroom Assessment Scoring System (CLASS) (Pianta, LaParo, & Hamre, 2008) used in much of the research in this area. The TTIF describes three domains of interactions that have strong theoretical and empirical backing: emotional support, classroom organization, and instructional support. Further details about each of these areas are provided here.

In emotionally supportive classrooms, teachers and children have positive relationships and enjoy spending time together; teachers are aware of and responsive to children's needs and emphasize children's interests, motivations, and points of view. In less emotionally supportive classrooms, teachers and children appear emotionally distant from one another, there are instances of frustration, teachers seldom attend to children's need for additional support, and, overall, the classroom follows the teacher's agenda with little opportunity for child input. Multiple studies in the United States have demonstrated associations between teachers' provision of emotionally supportive interactions in the classroom and children's socio-emotional development. For example, children show gains in prosocial skills (Johnson, Seidenfeld, Izard, & Kobab, 2013) and self-regulation (Williford, Vick-Whittaker, Vitiello, & Downer, 2013) when teachers form close relationships with them and are sensitive to their needs. Further, emotional support can mitigate the negative effects of child behavior problems, allowing children to more fully engage in classroom learning opportunities (Dominguez, Vitiello, Fuccillo, Greenfield, & Bulotsky-Shearer, 2011). In addition, consistency in emotional support seems particularly important for young children. Classrooms that provide consistently high emotional support are associated with reduced stress in children (Hatfield, Hestenes, Kinter-Duffy, & O'Brien, 2013) and academic gains (Curby, Brock, & Hamre, 2013) throughout the preschool year.

In highly organized classrooms, teachers are proactive in managing behavior by setting clear expectations, enact clear classroom routines that allow children to quickly become engaged in meaningful activities, and actively promote children's engagement in those activities. In a less-organized classroom, on the other

hand, teachers might spend much of their time reacting to behavior problems, classroom routines are not evident, and children spend time wandering around or not engaging in activities, even as teachers do little to intervene. When teachers intentionally and positively manage children's attention and behavior, children show improved classroom behavior and engagement (Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009), as well as higher cognitive and academic growth, than their peers in less organized classrooms (Downer, Booren, Lima, Luckner, & Pianta, 2010; Downer, Sabol, & Hamre, 2010).

Finally, high levels of instructional support encompass teachers' abilities to promote higher order thinking and language while providing quality feedback to extend children's learning. At the low end, one might see rote and fact-based activities where children receive little to no feedback about their work beyond if it is correct and classroom talk is teacher-driven. The quality of instructional support provided in a classroom is linked to children's positive academic outcomes (Burchinal et al., 2008, 2010; Mashburn et al., 2008). For example, in an examination of 1,129 low-income North American children enrolled in 671 pre-kindergarten classrooms, Burchinal et al. (2010) found a significant association between instructional support and academic skills; classrooms demonstrating higher instructional support had children who scored higher on measures of language, reading, and math than those enrolled in classrooms with low-quality instructional support.

### **Research on teacher-child interactions in Latin America**

As interest in early childhood education has grown, an increasing number of countries outside the United States have begun to study and address the quality of teacher-child interactions. To date, however, very little work studying this aspect of early childhood classroom quality in Latin American countries has taken place. Two very recent and notable exceptions exist. In both studies, a direct Spanish translation of the Classroom Assessment Scoring System (CLASS) was used as a standard measure of teacher-child interaction quality. Given that CLASS was developed for use in classrooms in the United States, these two studies allow both for the examination of teacher-child interaction quality in Latin America, as well as an opportunity to examine if the behaviors assessed by CLASS relate to children's development in similar ways across countries.

In one study, Leyva et al. (2015) utilized data on 1,868 children across 91 public pre-kindergarten classrooms in an urban area of Chile to evaluate the relation between the quality of teacher-child interactions and children's cognitive and language development. They found positive associations between higher quality interactions and children's gains in early writing and in cognitive inhibitory control. In the other Latin American study of teacher-child interactions and children's development, Araujo, Carneiro, Cruz-Aguayo, and Schady (2015) randomly assigned over 15,000 children in the coastal region of Ecuador to 450 different kindergarten sections. Children were assessed at the beginning and end of the academic year with an extensive battery of tests, including measures of language, math, and executive function. Results indicated that children who experienced higher teacher-child interaction quality as measured by CLASS had higher test scores in language, math, and executive function at the end of the year. Thus, these studies suggest that teacher-child interactions as measured by CLASS are relevant to the development of children in Latin America.

These studies also showed that the average quality of interactions followed a similar pattern in Chile and Ecuador, as has been reported in studies in the United States. Specifically, across the United States, Chile, and Ecuador, emotional support and classroom organization tend to be higher—in the mid to high range—relative to instructional support, which tends to be in the low to low-mid range. The same pattern of relative weakness in instructional support has been seen in European countries, as well (Salminen et al., 2012). To summarize, strong and growing evidence suggests that increasing access to early childhood education is not enough on its own to substantively boost children's learning and development. The quality of children's experiences—and, in particular, the quality of teacher-child interactions—is a critically important piece that may be missing from initiatives designed only to increase access.

### Ensuring consistent measurement of effective teacher-child interactions

In the United States, a strong recent focus on accountability—holding individual programs accountable for the child outcomes they achieve—has led to the widespread development of rating systems that use a common set of measures to compare quality across programs (Connor & Morris, 2015). These systems, coupled with incentives and occasionally with penalties, are designed to push early childhood programs to improve their quality of care. Their adoption in state and federal program guidelines and monitoring has led to the rapid scale-up of quality measures, including the CLASS observation (Connor & Morris, 2015; Office of Head Start, 2012). Because these systems are frequently high stakes, researchers are increasingly interested in examining issues related to training, reliability, and validity, as well as observation procedures that may influence the usefulness of these measures at scale. Studies using the CLASS observation are beginning to explore these important issues and will be briefly touched on here.

CLASS measures teacher-child interactions aligned with the TTIF theory (Hamre & Pianta, 2007). Multiple versions of CLASS exist (Infant, Toddler, Pre-K, K-3, Upper Elementary and Secondary) but for the purposes of this paper, we will focus on CLASS Pre-K. CLASS Pre-K is typically used in classrooms serving children between 3 and 6 years old and captures 10 dimensions of interactions, categorized into the three broad domains discussed earlier: Emotional Support, Classroom Organization, and Instructional Support (Pianta, LaParo, & Hamre, 2008). The observations are collected in multiple, 30-minute cycles, which consist of 20 minutes of observation and note taking followed by 10 minutes to code the 10 dimensions. Dimensions are coded on a scale of 1 to 7, corresponding to low (1-2), mid (3-5), and high (6-7) ranges of quality. The CLASS coding manual provides detailed behavioral descriptors of quality in each range.

**Training.** Training for CLASS typically involves a two-day intensive workshop followed by a reliability test. Participants are considered CLASS observers only after successfully participating in the full training and successfully passing the reliability test. Although many studies have trained groups of coders for research projects, we know of only one study examining the training of CLASS coders at scale. In this study, researchers collected information about reliability rates and characteristics of training participants, which included over 2,000 Head Start preschool staff members trained in CLASS over a 10-month period (Cash, Hamre, Pianta, & Myers, 2012). Programs were encouraged to send staff members «to build staff capacity to assess and improve classroom quality in their programs» (p. 531), and thus the participants likely differed from observers who are hired and trained specifically to conduct high-stakes observations. Trainings were delivered by 25 Head Start Training and Technical Assistance providers who had been trained by researchers connected with the CLASS developers. The CLASS trainings were three days long and were limited to 20 participants each. On the last day of training, participants took a reliability test, which required them to watch and code three 20-minute video segments; participants passed the test when 80% of their codes were within one point of expert-determined master codes.

Results suggest that participants were largely successful in calibrating to the CLASS (Cash et al., 2012). Seventy-one percent passed the reliability test on the first attempt, demonstrating a high level of agreement between trainees' and experts' codes. Some trainee characteristics were associated with lower reliability on several dimensions of the CLASS, including being of non-white race or ethnicity, holding more teacher-centered rather than child-centered beliefs about how children learn, and attaching less importance to intentional teaching (Cash et al., 2012). These effects were more pronounced for dimensions capturing the quality of instructional interactions. Overall, this study suggests that early childhood professionals in the United States can be trained to reliability on the CLASS observation and that particular characteristics may be more beneficial when considering who the coders might be.

**Reliability and validity at scale.** Studies suggest that diverse groups of coders can be trained to reliably observe classrooms; examples come from Chile (Leyva et al., 2015), Germany (von Suchodoletz, Fäsche, Gunzenhauser, & Hamre, 2014); Ecuador (Araujo, Carneiro, Cruz-Aguayo, & Schady, 2015), and the United States (e.g., Philips, Gormley, & Lowenstein, 2009). Data from research studies, however, may be of limited relevance when considering scaling, as these projects typically choose a small group of coders and carefully monitor their reliability. To address this issue, several United States-based studies have used research datasets to identify sources of error in observations of teacher-child interactions to inform best practices for observing classrooms reliably at scale. For example, work by Mashburn, Downer, Rivers, Brackett, and Martinez (2013) using data from elementary school observations, showed that significant

variance in CLASS scores was attributable to overall differences between observers (accounting for 4% to 18% of the variance) and differences between observers from cycle to cycle within a classroom (accounting for 27% to 33% of the variance). These results suggest that observation projects can maximize the amount of true score variance by increasing the number of days each classroom is observed and the number of observers who code the classroom each day (Mashburn et al., 2013). Further work is clearly needed in this area to explore the tradeoffs between increased cost of observation versus increased reliability of scores.

Other work has attempted to address issues of CLASS validity by examining the tool's measurement properties across diverse ethnic groups and cultures. Within the United States, researchers found that the CLASS showed strong factor invariance across preschool classrooms with varying proportions of Latino children and dual language learners (Downer, López, Grimm, Hamagami, Pianta, & Howes, 2012). Specifically, CLASS scores were associated with child outcomes in similar ways across all classrooms, suggesting that exposure to effective interactions as defined by the CLASS was equally important for dual language learners and English-only learners, as well as Latino children and non-Latino children (Downer et al., 2012). Internationally, the studies cited previously from Chile and Ecuador (Araujo et al., 2015; Leyva et al., 2015) as well as an additional study in Belgium (Buyse, Verschueren, & Doumen, 2011) have found associations between CLASS scores and child outcomes, while studies in Ecuador and Finland (Araujo et al., 2015; Pakarinen et al., 2010) have validated the factor structure and concurrent validity of the CLASS. These studies, although limited, provide some evidence of construct validity and predictive validity in culturally-diverse classrooms.

Thus, reliability and validity evidence suggests that large groups of early childhood professionals can learn to use a high-inference tool like the CLASS, and that the CLASS captures something important and consistent about teacher-child interactions across some cultures. Much more work is needed to examine the reliability and validity of the CLASS and other similar measures as monitoring efforts are taken to scale. Further work is also needed to validate measures of teacher-child interactions cross-culturally and determine whether the key elements of interactions captured by the CLASS (and other existing measures) are relevant and meaningful in diverse cultural contexts.

### **Improving early childhood classroom interactions**

Of course, the ultimate goal of measuring teacher-child interactions is to actually improve the experiences and outcomes of children in the classrooms that serve them. Recent US studies suggest that wide scale efforts to improve quality via structural features, such as those conducted as part of the Quality Rating and Improvement System initiatives, are not resulting in improved interactions in the classroom (Sabol, Hong, Pianta, & Burchinal, 2013). Other work, however, suggests that systematically designed coaching and coursework can lead to improved teacher-child interactions (Fox, Hemmeter, Snyder, Binder, & Clarke, 2011; Hamre et al., 2012; Yoshikawa et al., 2015) and will briefly be expanded on here.

One professional development intervention example that focuses specifically on improving teacher-child interactions in early childhood education classrooms comes from work out of the National Center for Research on Early Childhood Education (NCRECE). NCRECE developed and tested both a course and coaching interventions intended to improve preschool teachers' observed teacher-child interactions related to children's learning (Burchinal et al., 2008; Hamre, Pianta, Downer, & Mashburn, 2008; Mashburn, Downer, Hamre, Justice, & Pianta, 2010; Pianta et al., 2008). Specifically, both interventions use the TTIF (Hamre et al., 2012), with a focus on teacher-child interactions as measured by the Classroom Assessment Scoring System (Pianta, LaParo & Hamre, 2008) as the central component of the interventions.

Briefly, the NCRECE interventions are: (a) a semester-long, 14-week course focused on effective interactions as specified through the TTIF; and (b) the year-long MyTeachingPartner (MTP) approach to coaching focused on improving teacher-child interactions as defined by the TTIF (see Downer et al., 2012; Hamre et al., 2012, for more information about the interventions and study design). In the NCRECE study, the course was delivered in 14 three-hour sessions through collaborations with local colleges and universities. As part of the course, participants learned about the TTIF, completed readings, engaged in analyzing videos of teaching practice, and completed homework in which they practiced analyzing others' teaching practice and then reflected on their own. For those receiving MTP

coaching, participants engaged in regular cycles with their coach that included taping their teaching practice, reflecting on specific aspects of their teaching as defined by the TTIF, conferencing with their coach to talk in detail about the shared observations, and then developing a plan of what interactions to focus on for the next coaching cycle. As part of both interventions, participants also had unlimited access to a website providing video examples of effective preschool teacher-child interactions.

The impacts of the NCRECE course and MTP coaching were evaluated relative to no-intervention controls on multiple outcomes, including teachers' observed instructional practice as measured by CLASS. In both cases, preschool teachers who received either the course or MTP coaching demonstrated improvements in observed instructional teacher practice (Downer et al., 2012; Hamre et al., 2012). Thus, these findings point to preliminary evidence that teachers can improve their interactions with children in ways that promote their development and learning.

### **Scaling up professional development interventions**

Despite promising results, few of these professional development approaches have been delivered on a large scale, and doing so presents challenges, particularly in relation to training and supporting coaches or instructors to deliver the programs with fidelity (Lloyd & Modlin, 2012). However, several research-based programs retain significant impacts when delivered at scale, including the Incredible Years program within Head Start CARES (Classroom-based Approaches and Resources for Emotion and Social skill promotion; Morris et al., 2014), First 5 California's efforts (First 5 California, 2014) to scale online coaching, and work in Texas that blends coursework and coaching statewide (Landry, Anthony, Swank, & Monseque-Bailey, 2009).

In addition, two success stories stem from recent state-wide initiatives in the United States: Georgia's Pre-K Professional Development Evaluation (Early et al., 2014) and the Comprehensive Approaches to Raising Educational Standards, Plus (CARES Plus) in California (First 5 California, 2014). In the Georgia study, 486 teachers were randomly assigned to one of two professional development models focused on teacher-child interactions, Making the Most of Classroom Interactions (MMCI) and MyTeachingPartner (MTP), or the control group. Results from this study demonstrated that both interventions were effective at increasing teachers' emotional support in pre-K classrooms as measured by CLASS. In addition, teachers who participated in MMCI demonstrated increases in CLASS instructional support and knowledge of effective interactions. Similar results were demonstrated through the CARES Plus program in California, where over 10,000 teachers received basic, online instruction related to teacher-child interactions and then chose between completing more in-depth professional development focused on either general early childhood topics or MTP coaching. Across the options, those who participated in the MTP coaching component showed gains in instructional support. Thus, results from these two state-wide efforts show that focused and scalable professional development can be successful in improving multiple facets of interaction quality.



### Discussion and future directions

As noted previously, the studies presented here were intended to illustrate trends in the field and do not represent all the literature available on this important topic. It is possible that there are key papers and topics not included in this article, but which should nevertheless be considered as research as the field moves forward. Despite this, the international literature presented points to what children experience within the classroom as the primary mechanism through which they learn and should be something to consider as Latin American countries begin to scale up early childhood education. Findings presented point to three key considerations as the field moves forward.

First, studies of early childhood education and subsequent investments need to include a systematic study of children's classroom experiences. The use of standardized observations, if they reliably and validly measure classroom interactions and experiences, is a direct and effective mechanism for focusing on aspects of the classroom experience that directly impact children. As evidence suggests, CLASS can be used across diverse countries in ways that provide useful information about children's experiences. More work, though, needs to be done to understand if there are culturally specific classroom elements that also need to be considered.

In addition to interactions, paying attention to how children spend their classroom time is warranted. For example, Cabell, DeCoster, LoCasale-Crouch, Hamre, and Pianta (2013) found that quality varied based on the setting (e.g., whole versus small group) and activity (e.g., literacy versus science). Further, studies have found that content-specific instructional time and strategies also contribute to children's learning. For example, recent work found that when teachers draw children's attention specifically to print, children learn more (Piastra, Justics, McGinty, & Kaderavek, 2012). This points to the need to consider both the quality of the classroom interactions and with which types of content these interactions engage as key mechanisms to support children's development.

Finally, to engage in the types of classroom interactions described here, evidence suggests that early childhood teachers need specific training and feedback about how best to implement these practices to support children's development. Improvement of teaching and learning rests on aligning professional development and classroom practices with desired child outcomes. In particular, the early education field needs professional development options for teachers supported by empirical evidence demonstrating that they produce classroom practices (e.g., teacher-child interactions) that result in the acquisition of desired skills among children (e.g., literacy skills). As reported here, multiple studies now show that teachers who receive coursework and coaching on effective teaching practices can make positive changes in their daily interactions with children in ways that have meaningful consequences for their learning and development (Brennan, Bradley, Allen, & Perry, 2008; Domitrovich et al., 2009; Fox et al., 2011; Hamre et al., 2012; Mashburn et al., 2008; Yoshikawa et al., 2015). Thus, the central question now is how to shift resources to professional development models with promise and evidence, while at the same time investing in developing a much greater supply of proven-effective models. Children's futures are depending on it.

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