

# Quality of the Literacy Environment in Inclusive Early Childhood Special Education Classrooms

Ying Guo

*University of Cincinnati, Cincinnati, OH, USA*

Brook E. Sawyer

*Lehigh University, Bethlehem, PA, USA*

Laura M. Justice

*The Ohio State University, Columbus, OH, USA*

Joan N. Kaderavek

*University of Toledo, Toledo, OH, USA*

The purpose of this study was to examine the quality of the literacy environment in inclusive early childhood special education (ECSE) classrooms ( $N = 54$ ). The first aim was to describe the quality of the literacy environment in terms of structure (i.e., book materials and print/writing materials) and instruction (i.e., instructional support). The second aim was to examine the interrelationships among teacher and classroom factors and the quality of the literacy environment. Results showed that, on average, the quality of the structural literacy environment was low to moderate, and the quality of the instructional literacy environment was generally low. Only one factor, the number of children who were dual-language learners, related to the quality of the structural literacy environment, whereas the quality of the instructional literacy environment was positively associated with two teacher-level factors (teacher education and self-efficacy) and negatively associated with one teacher-level factor (the number of language and literacy workshops attended). Study findings suggest the need to examine ways to improve the literacy environment of ECSE classrooms and to better understand sources of variance with respect to the literacy environment.

**Keywords:** *literacy, structure, instruction, teacher quality*

Inclusion of preschool-age children with disabilities in natural learning environments with peers who are typically developing has become a mainstay in the field of early childhood special education (ECSE), with about 48% of all preschoolers with disabilities served in inclusive classrooms (U.S. Department of Education, 2007). Enrollment in a high-quality preschool classroom positively supports children's overall development (e.g.,

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**Authors' Note:** Ying Guo, School of Education, University of Cincinnati; Brook E. Sawyer, College of Education, Lehigh University; Laura M. Justice, Department of Teaching and Learning, The Ohio State University; Joan N. Kaderavek, Department of Early Childhood, Physical & Special Education, University of Toledo. This research was supported in part by R324A080037 from the U.S. Department of Education, Institute of Education Sciences. We are very grateful to the children, families, teachers, administrators, and research staff who participated in this project. Correspondence concerning this article should be addressed to Ying Guo, School of Education, University of Cincinnati, 246D Teacher/Dyer Hall, 2610 McMicken Cir, Cincinnati, OH 45221; email: [guoy3@ucmail.uc.edu](mailto:guoy3@ucmail.uc.edu).

Burchinal et al., 2000; Peisner-Feinberg & Yazejian, 2010), and one component of a high-quality classroom is its literacy environment. The literacy environment, such as the number of books in the classroom and the nature of instruction provided by the teacher, has been linked to children's emergent literacy skills (e.g., Guo, Justice, Kaderavek, & McGinty, 2012; Wasik & Bond, 2001). In turn, continuity between children's emergent literacy skills and their later reading achievement is well documented in the literature (e.g., Lonigan, 2006; Storch & Whitehurst, 2002), as is the elevated risk that preschool children with disabilities face with respect to experiencing reading disabilities in the later grades (e.g., Catts, Fey, Tomblin, & Zhang, 2002).

Research conducted to date on the literacy environment of inclusive classrooms has not provided a comprehensive assessment of the multiple features of a high-quality literacy environment. To contribute to this literature, we examined the quality of inclusive ECSE classrooms. Specific aims of our study were to (a) describe the literacy environment with respect to structural and instructional features and (b) examine the extent to which teacher and classroom factors relate to the literacy environment. Our goal in conducting this study was largely descriptive, as there is little information about the literacy environment in ECSE classrooms. Future research that builds on these findings, particularly findings that show how classroom literacy environments can be strengthened to enhance children's literacy outcomes, will be an important avenue for the ECSE research community.

## The Classroom Literacy Environment

Studies examining the quality of preschool programs show the importance of *structural* (i.e., material resources) and *instructional* (i.e., teacher-child interactions) features of classroom learning environments (e.g., Dunn, Beach, & Kontos, 1994; Early et al., 2007) on children's emergent literacy development. Regarding the former, the structural literacy environment dimension comprises the tangible literacy materials that are available to children throughout the classroom setting (Wolfersberger, Reutzel, Sudweeks, & Fawson, 2004), such as children's books, print props (e.g., shopping lists, calendars), and writing materials (e.g., markers, pens, papers; Ingham, 1981; Neuman, 1999; Wolfersberger et al., 2004). Classrooms that provide children with a high-quality structural literacy environment include a collection of high-interest children's books in a well-organized classroom library (e.g., Dowhower & Beagle, 1998; Morrow, 2005; Neuman & Roskos, 2007). In this library, the books would vary in the level of difficulty from simple to more complex text and represent a variety of text genres, such as information, alphabet, concept, and rhyming texts (Justice, 2006; Katims, 1995; Neuman & Roskos, 2007).

Considerable research findings have suggested that having a library that includes a variety of engaging books (e.g., genre, topics) fosters children's literacy skills (Justice, 2006; Katims, 1995; Morrow, 2005; Neuman & Roskos, 2007; Vukelich, Christie, & Enz, 2012). Providing children with books of different genres and topics addresses their various interests and motivations to read (Fractor, Woodruff, Martinez, & Teale, 1993; Vukelich et al., 2012). In addition, empirical evidence supports the importance of providing informational books to preschool and elementary children because they increase children's academic vocabulary, world knowledge, and listening comprehension (Chapman, Filipenko, McTavish, & Shapiro, 2007; Duke & Kays, 1998; Kraemer, McCabe, & Sinatra, 2012). In

addition, informational books are well suited to facilitating young children's reading interest, attention, and engagement (Barrs & Pidgeon, 1994; Chapman et al., 2007).

An additional characteristic of literacy-rich classroom settings is that they provide children with considerable contact with print, which occurs through the display of functional print materials (e.g., posters, signs, teacher and child writing samples). These displays provide children with examples of how spoken words can be represented in print (Justice, 2006). Literacy-rich classrooms also promote a variety of writing experiences by providing children access to different writing tools and materials (e.g., pencils, crayons, paper, and stamps; Schickedanz & Casbergue, 2009; Vukelich et al., 2012). Studies show that there are direct linkages between children's access to print and writing materials and the literacy development of children. This includes studies with children who are typically developing (e.g., Guo, Justice, et al., 2012; Roskos, Christie, Widman, & Holding, 2010) and children with disabilities (Easterbrooks, Lederberg, & Connor, 2010; Katims, 1994).

The instructional literacy environment concerns the way in which teachers interact with children to support their literacy development, particularly as occurs through classroom discussions and activities (Hamre & Pianta, 2005; Justice, Mashburn, Hamre, & Pianta, 2008; Makin, 2003; R. C. Pianta & Hamre, 2009). Strategies characteristic of high-quality instructional literacy environments include teachers' open-ended questioning, engaging children in frequent conversations, modeling complex vocabulary, scaffolding complex thinking, and providing explicit instruction on language and literacy skills (e.g., Justice, Mashburn, Hamre, et al., 2008; Kaiser & Hancock, 2003; Lonigan & Whitehurst, 1998; R. C. Pianta & Hamre, 2009; Snow, Burns, & Griffin, 1998). In a multistate study of prekindergarten programs, observations of teachers' engagement of these practices, represented in global rating schemes, were significantly related to young children's language and literacy outcomes (e.g., Mashburn et al., 2008).

## **The Literacy Environment of Inclusive ECSE Classrooms**

Important work has examined the quality of the literacy environment of preschool classrooms (e.g., Buysse, Wesley, Bryant, & Gardner, 1999; Hestenes, Cassidy, Shim, & Hegde, 2008; La Paro, Sexton, & Snyder, 1998). More research has focused on typical (i.e., general education) than inclusive preschool classrooms. Findings on typical preschool classrooms have suggested that these classrooms offer low levels of quality with respect to the structural (e.g., Dunn et al., 1994; McGee, 2007) and instructional literacy environments (e.g., Justice, Mashburn, Hamre, et al., 2008). More detailed information is needed about the literacy environment within inclusive ECSE classrooms as well as factors that may explain variance in the quality of the literacy environment. Here, we provide a brief summary of salient research findings on the literacy environment of ECSE classrooms.

One aim of several studies was to compare the global quality, including aspects related to the literacy environment, of typical and inclusive preschool programs (Buysse et al., 1999; Hestenes et al., 2008; La Paro et al., 1998). The measures used in these studies provided a broad examination of the literacy environment but did not parse out the structural literacy environment from the instructional environment. For instance, Buysse et al. (1999) used the *Early Childhood Environmental Rating Scale* (ECERS; Harms & Clifford, 1980) to examine the global quality of 62 inclusive ECSE classrooms and 118 typical classrooms. Hestenes

et al. (2008) used the revised version of the ECERS (ECERS-R; Harms, Clifford, & Cryer, 1998/2005) to examine 459 inclusive ECSE classrooms and 854 typical preschool classrooms. The ECERS and ECERS-R comprise a number of subscales (e.g., Space and Furnishings, Interactions, Activities), including a Language-Reasoning subscale. This subscale can be conceived as providing information about features of the structural and instructional literacy environments. It provides a single value on a scale from 1 to 7 across multiple features of the environment, such as the quality of available books and pictures, teachers' encouragement of children's attempts to communicate, and teachers' use of language to develop children's reasoning skills and informal use of language. Both studies found that inclusive ECSE classrooms had statistically significant higher ratings on the Language-Reasoning subscale than the comparison typical classrooms. Practically speaking, the classrooms in both studies reflected the same level of quality: between "good" and "minimally acceptable" in the work of Buysse et al. and "good" in the work of Hestenes et al.

Other work conducted in inclusive classrooms has examined in detail one specific component of the instructional literacy environment, namely the nature of teacher talk. For instance, J. Smith, Warren, Yoder, and Feurer (2004) reported that teachers seldom used high-quality language facilitation techniques (i.e., linguistic mapping, expansion, imitation) with young children with disabilities or their peers. More recently, Soukakou (2012) conducted a study with 45 preschool teachers in inclusive classrooms in the United Kingdom. On average, teachers provided a very low degree of feedback to their students, in regard to frequency and type.

## **Factors Associated With the Classroom Literacy Environment**

Teacher-level and classroom-level factors serve to explain variance in overall classroom quality in early childhood classrooms, although much of this work has focused on noninclusive preschool settings. To this end, it is important to examine these factors as they apply specifically to the literacy environment of ECSE classrooms. Teachers in inclusive classrooms provide instruction to children with and without disabilities, and thus must address a wider range of learning needs (Odom, 2000). As a result, different teacher and classroom factors may be more salient to the literacy environment in inclusive classrooms than in typical preschool classrooms.

Extant literature has suggested that several teacher factors are associated with the literacy environment, namely teachers' education level (e.g., Cohen, Raudenbush, & Ball, 2003; Jeon et al., 2010), years of teaching experience (e.g., U.S. Department of Education, 2001), participation in professional development (PD) training (e.g., Cohen & Hill, 2000), and teacher beliefs (i.e., self-efficacy; see Guo, Piasta, Justice, & Kaderavek, 2010). Classroom factors that predict the literacy environment include the composition of the classroom in terms of students' characteristics and skills (e.g., Justice, Mashburn, Hamre, et al., 2008; R. C. Pianta, La Paro, Payne, Cox, & Bradley, 2002).

The empirical evidence regarding the association between teacher education (i.e., formal years of schooling) or teaching experience and the quality of classroom environment is somewhat mixed and inconclusive. Buysse and colleagues (1999) found that teachers in inclusive ECSE and typical classrooms who had bachelor degrees and more teaching

experience in early childhood education received higher ratings of classroom quality than teachers with less education (i.e., high school degree or less) and experience. Hestenes et al. (2008) found similar results, with teacher education and teaching experience predicting the quality of inclusive and typical preschool classrooms. In contrast, other studies have found no significant association between teacher education or teaching experience and the global quality of classroom environment in typical preschool classrooms (Early et al., 2007; Justice, Mashburn, Hamre, et al., 2008). Moreover, one recent study found a negative relation between teachers' years of teaching experience and instructional quality in inclusive ECSE classrooms (Jeon et al., 2010).

Some literature has shown a positive relation between teachers' participation in PD training and the quality of the classroom literacy environment. Justice, Mashburn, Hamre, et al. (2008) reported a positive association between teachers' participation in language and literacy workshops and the quality of the instructional literacy environment in typical preschool classrooms. Grace and colleagues (2008) also reported that structured PD training significantly enriched the quality of the literacy environment of typical preschool classrooms. However, the results of some PD studies have indicated that participation in PD training may not be sufficient to bring about significant changes in the quality of the instructional literacy environment (e.g., Justice, Mashburn, Pence, & Wiggins, 2008). This may be because PD is not always of high quality. High-quality PD should incorporate the use of evidence-based instructional approaches (Dunst & Trivette, 2009) and include opportunities for teachers to reflect on their knowledge and experience related to evidenced-based practices (Bradley & Reinking, 2011). Furthermore, in addition to training workshops, individualized mentoring and coaching may be necessary for changing teachers' behaviors (Powell, Diamond, Burchinal, & Koehler, 2010).

Self-efficacy refers to teachers' judgment of their teaching capability, and recent studies have shown a positive relation between teachers' sense of self-efficacy and the quality of the instructional literacy environment (e.g., Guo, Connor, Yang, Roehrig, & Morrison, 2012; Justice, Mashburn, Hamre, et al., 2008). Furthermore, teachers' sense of self-efficacy was also associated with their capacity and motivation to teach (Damon, 2007). Thus, some scholars contend that teacher self-efficacy should be viewed as an important aspect of teacher quality (e.g., Guo, Connor, et al., 2012) that can help shape the nature of the classroom learning environment.

Specific factors of the classroom may also play important roles in shaping the quality of the classroom environment (e.g., Justice, Mashburn, Hamre, et al., 2008; R. C. Pianta et al., 2002). One way to characterize the classroom environment with respect to inclusive settings is how many children with individualized education plans (IEPs) are served. Although all-inclusive ECSE classrooms enroll children with disabilities and children who are typically developing, the ratio can be quite varied. One recent study found that the percentage of children with IEPs was positively associated with the quality of the instructional literacy environment (Justice, Mashburn, Hamre, et al., 2008); a higher quality instructional literacy environment was observed in classrooms with a higher percentage of children with IEPs.

The average level of literacy skills among children in a classroom may also be related to the quality of the literacy environment. Many studies have suggested that a higher quality literacy environment supports young children's literacy skills (e.g., Guo, Justice, et al.,



2012). However, a reciprocal relation may also exist, such that children's skill levels may influence the quality of classroom literacy environment.

Finally, it is also possible that the number of children who are dual-language learners (DLLs; that is, children learning English simultaneous to or following the language spoken at home; Gutiérrez, Zepeda, & Castro, 2010) within inclusive ECSE settings may influence the literacy environment. The children who are DLLs comprise approximately 20% of the school-age population (Capps, Fix, Ost, Reardon-Anderson, & Passel, 2004), with even higher percentages in preschool programs that serve primarily a low-income population, such as Head Start (28% DLLs; Administration for Children and Families, 2008). Some evidence suggests that enrollment in high-quality programs has been linked to significant growth in DLLs' language skills (e.g., Barnett, Yarosz, Thomas, Jung, & Blanco, 2007) and that children who are DLLs may derive greater gains from high-quality preschool programs than other preschool children (Barnett, Lamy, & Jung, 2005; Gormley & Gayer, 2005). Thus, it is worthwhile to examine whether the proportion of children who are DLLs within ECSE classrooms may have bearing on the nature of the literacy environment.

Informed by these previous studies, we examined in the present study four teacher factors and three classroom factors with respect to their contribution to explaining variance in the classroom literacy environment. Teacher-level factors included (a) teachers' education (i.e., formal years of schooling), (b) teaching experience, (c) PD experiences, and (d) self-efficacy beliefs. Classroom-level factors included (a) the number of children with IEPs, (b) average level of literacy skills (among children in the classroom), and (c) the number of children who were DLLs.

## Goals of the Present Study

As Buysse and colleagues (1999) pointed out, participation in inclusive ECSE programs can benefit children with and without disabilities, but only under the right conditions. Researchers contend that the "quality of programs," including the classroom environment (i.e., structural features of the classroom) and the quality of instruction, is likely to mediate the effectiveness of inclusive programs (Guralnick, 2001; Odom, 2000). Consequently, studies that improve our understanding of the quality of the environment in inclusive ECSE classrooms are timely and warranted. The literacy environment is of particular interest, given its role in supporting children's early literacy development.

We addressed two primary research aims in the current study. The first aim was to characterize the structural and instructional quality of the literacy environment in inclusive ECSE classrooms. The second aim was to examine the contribution of teacher and classroom-level factors to the quality of the literacy environment in inclusive ECSE classrooms.

## Method

The activities of the current study were nested within a larger multisite experimental study of book-reading practices in ECSE classrooms. The main purpose of the larger study was to evaluate the impact of a book-reading intervention on the emergent literacy skills of

preschool children in ECSE classrooms. The data used in the present study were collected before any experimental procedures were implemented; thus the experimental design of the larger study would not have had bearing on the research reported here. In the description of study methods, we present only those directly relevant to the present research aims.

## Participants

This study included data drawn from the inclusive ECSE classrooms of 54 preschool teachers working within a single Midwestern state. The 54 teachers were part of the first and second cohorts of the larger study. Teachers were primarily female (98.1%) and non-Hispanic White (93%); other ethnicities represented were African American (2%), Native American (4%), and Chinese (1%). All of the teachers had at least a 4-year degree. In terms of highest level of educational attainment, 18.5% had an educational specialist certification or professional diploma beyond a master's degree ( $n = 10$ ), 57.4% had a master's degree ( $n = 31$ ), 9.3% had at least 1 year of coursework beyond a bachelor's degree ( $n = 5$ ), and 14.8% had a bachelor's degree ( $n = 8$ ). Among these teachers, 50% had a degree in special education ( $n = 27$ ). On average, teachers had 14 years of total preschool teaching experience ( $SD = 9.3$ ), with a range of 1 to 37 years. Forty-four teachers reported using a state-developed curriculum, 12 used a locally developed (e.g., district) curriculum, and 1 teacher reported not using any curriculum. The majority (81%) of the inclusive ECSE classrooms were half-day ( $n = 44$ ), while the remainder were full-day programs ( $n = 10$ ). On average, 8 children (4 children with disabilities, 4 typical peers) were enrolled per classroom (range of 4 to 10 children per classroom).

In general, all of the ECSE teachers implemented some literacy activities within their classrooms. In an initial questionnaire, and using a 5-point scale (1 = *less than once a week*, 5 = *more than once a day*), teachers described the frequency with which they engaged in four specific literacy activities. For frequency of book reading, the mean rating was 4.5 (range = 4-5); for phonological awareness activities, the mean was 3.25 (range = 1-5); for letter activities, the mean was 3.9 (range = 1-5); and for name-writing activities, the mean was 4.1 (range = 1-5).

Data were available for 439 children (60% boys) from the 54 classrooms. The majority of the children were non-Hispanic White (74.9%). Other race and ethnicities were also represented, with 11.8% of the children identified as African American/Black, 4.9% as Hispanic/Spanish/Latino, 2.9% as Asian, 0.5% as Native American/American Indian, and 5% as multiracial. Children's average age was 3.9 years ( $SD = 0.7$  year; range = 3-5 years). In total, 54% of the children had IEPs, and 46% received speech-language intervention services. Eight percent of children had identified developmental disabilities including autism ( $n = 21$ ), cerebral palsy ( $n = 5$ ), Down syndrome ( $n = 3$ ), ADHD ( $n = 2$ ), and other diagnoses (e.g., Stickler syndrome, Tourette syndrome, apraxia;  $n = 8$ ). A small percentage (4%) were children who were DLLs. The socioeconomic status of the children can be inferred based on annual household income. Almost half of children's families (46.5%) had an annual household income above \$65,000 per year, 28% of families between \$30,000 and \$65,000 per year, and 26% less than \$30,000 per year. In the United States, the median family income was \$49,445 in 2011 (U.S. Census Bureau, 2011); thus, in the present sample, nearly half of families were above the median U.S. income.

## Procedures

Recruitment into the larger study began with classroom teachers via 1-hr information sessions provided in local school districts. At the end of each information session, interested teachers were consented into the study. To recruit children into the study, consent forms were provided to caregivers of all children within a classroom. From those received (average return rate of 85%), a screening process was used to enroll up to 10 children into the study: 6 children with IEPs and 4 children who were typically developing (i.e., no IEPs).

All data used in this study were collected concurrently in the fall of the school year. Teachers were required to complete a portfolio of questionnaires, including a questionnaire on demographic characteristics (i.e., education, teaching experiences) and beliefs (i.e., self-efficacy). In addition, a 2-hr systematic observation was conducted in each classroom to assess the quality of the classroom literacy environment using two instruments (see the Measures section). Observations were videotaped. For each observation, one instrument was completed live, while the second instrument was coded based on the videotape. Children's caregivers completed a portfolio of questionnaires, including a questionnaire documenting each family's demographic characteristics and indirect assessments of children's emergent literacy skills.

## Measures

*Structural literacy environment.* The Classroom Literacy Observation Protocol (CLOP; Children's Learning Research Collaborative, 2008) was used as the measure of the structural literacy environment. The instrument was coded live by trained members of the research team who met reliability standards. The CLOP is an observational measure that was adapted in part from the *Early Literacy and Language Classroom Observation* (ELLCO; M. Smith & Dickinson, 2002). We expanded the number of items representing the features of the structural literacy environment to provide a more encompassing assessment of the classroom with respect to books and print-related materials as well as developed more detailed descriptions of items to promote interrater reliability of the tool. (This tool is available from the authors.)

For this study, we used the 22 items on the CLOP that assess the availability of literacy-related materials in the classrooms. (Note: The CLOP also rates the frequency of children's use of literacy-related materials, but these items were not used in the present study.) These 22 items measure two domains of the structural literacy environment: (a) book materials (7 items), which describe the number of books in different genres available to children (e.g., "How many narrative story books are accessible in the classroom library?") and (b) print and writing materials (15 items), which focus on the number and variety of print materials (e.g., "How many print materials [e.g., birthday charts, calendars, weather boards, big book displays] are visible in the classroom?") and writing materials (e.g., "Are writing materials accessible to children in centers other than a writing center?"). The 7 items on book materials are rated on a 3-point scale to represent the number of books (1 = zero or 1 book; 2 = 2-3 books; 3 = 4 or more books). Of the 15 items describing the print and writing materials, 7 are rated on a 4-point scale (1 = 0 materials; 2 = 1-3 materials; 3 = 4-6 materials; 4 = 7 or more materials) and 5 are dichotomous (0 = no; 1 = yes). We



summed the scores for the two aspects (book materials and print and writing materials) to represent the overall quality of the structural literacy environment. Interrater reliability was established by having two observers independently, but simultaneously complete the CLOP on a randomly selected 20% of the classrooms. Interrater reliability was high, with intraclass correlation coefficients of .91.

*Instructional literacy environment.* The instructional support domain of the *Classroom Assessment Scoring System* (CLASS; R. C. Pianta, La Paro, & Hamre, 2008) was used to measure the instructional literacy environment. Coding was conducted via videotapes collected during the classroom observations; all coding was conducted by research staff who achieved a reliable threshold of implementation. As described previously, the instructional literacy environment defined in the present study concerns the general quality of teacher-child interactions believed to support children's language and literacy development, rather than the quality of literacy instruction (e.g., how teachers teach child alphabetic principle or phonemic awareness). The instructional support domain was designed to assess how teachers effectively use classroom activities and discussions to support children's development of language and literacy skills through back-and-forth conversations and use of explicit talk to describe literacy concepts (R. C. Pianta et al., 2008). Moreover, previous studies show the significant relations between this measure of instructional support and children's language and literacy skills (e.g., Howes et al., 2008; Mashburn et al., 2008).

The instructional support domain includes three dimensions: concept development, quality of feedback, and language modeling. The concept development dimension examines the teacher's use of discussions or activities to promote children's higher order thinking and cognitive skills. The quality of feedback dimension assesses the extent to which the feedback provided by the teacher expands children's learning and understanding. The language modeling dimension measures the quality and quantity of teachers' use of language-stimulation techniques. Each dimension is rated on a 1 to 7 scale, with 1 or 2 representing low-level quality; 3, 4, or 5 representing mid-level quality; and 6 or 7 indicating high-level quality. We used the mean of these three instructional support dimensions to represent the quality of the instructional literacy environment. Again, interrater reliability was determined by having two coders rate a randomly selected 20% of the total classroom sample. Interrater reliability was in accordance with the metric used by the CLASS developers, which is interrater agreement of 90%. The internal consistency (Cronbach's alpha) for the instructional support domain used in this study was .89.

*Teacher factor measure.* Teachers completed a questionnaire about their demographic information and beliefs and perceptions (i.e., self-efficacy). Responses are represented in Table 1. The data regarding teachers' education, teaching experience, and number of language and literacy workshops in which teachers had recently participated (i.e., informal education) were obtained from the demographic section. Teacher education was re-coded to a dichotomous variable for whether the teacher had attained a master's degree (1 = yes, 0 = no).

Teachers' self-efficacy was measured with the *Teacher Self-Efficacy Scale* (TSES; Bandura, 1997), a 19-item Likert-type questionnaire with response options ranging from 1

**Table 1**  
**Descriptive Statistics for Factors of Teachers and Classrooms**

Factor	<i>M</i>	<i>SD</i>	Range
Teacher characteristics			
Teacher education (master's degree or not)	0.76	0.43	0-1
Teaching experience	12.96	8.04	1-33
Number of workshops: language & literacy	1.37	0.97	0-3
Teacher self-efficacy	3.85	0.34	3-4.42
Classroom characteristics			
Number of children with IEPs	5.8	1.67	1-11
Proportion of children with IEPs	0.37	0.10	0.06-0.69
Children's emergent literacy skills	2.5	0.34	1.67-3.31
Number of children who are DLLs	1.06	2.15	0-8
Proportion of children who are DLLs	0.07	0.13	0-0.50

*Note.* Teaching experience = years of preschool teaching experience; teacher self-efficacy = the mean scores of 19 items from Teacher Self-Efficacy Scale; children's emergent literacy skills = the grand classroom mean of literacy skills; IEP = individualized education plan; DLLs = dual-language learners.

(*nothing*) to 5 (*a great deal*). This questionnaire assesses teachers' instructional and disciplinary self-efficacy as well as their efficacy to create a positive school environment. Items include questions such as "How much can you do to influence the class sizes in your school?" and "How much can you do to keep students on task on difficult activities?" We used the mean of the 19 items. Teachers' self-efficacy beliefs were moderately positive ( $M = 3.85$ ;  $SD = 0.34$ ; see Table 1). Internal consistency (Cronbach's alpha) was .79.

*Classroom factor measure.* For classroom factors, we included the following variables: (a) number of children with IEPs, (b) children's literacy scores aggregated at the classroom level (from fall assessments), and (c) number of children who were DLLs. Factors of classrooms are presented in Table 1. The information about the number and percentage of children with IEPs and DLLs was collected from teachers during the CLOP observation.

Caregivers completed the Parent Form of the *Clinical Evaluation of Language Fundamentals Preschool–Second Edition Pre-Literacy Rating Scale* (CELF Preschool-2 PLRS; Wiig, Secord, & Semel, 2004) as the measure of children's literacy skills. The 26 items of the PLRS focus on children's emergent reading (e.g., "Can point to the picture when an adult names it") and writing skills (e.g., "Copies and/or writes own name accurately"). For each item, caregivers rate on a 4-point scale how often the child demonstrates the skills (i.e., 1 = *never*; 2 = *sometimes*; 3 = *often*; 4 = *always*). The score for each child was created by computing the mean of all items. Because we hypothesized that the average level of literacy ability among children in a classroom would relate to the classroom literacy quality, we used the grand mean of the classroom (including all participating children in the classroom). There was variability across classrooms in terms of the average level of children's literacy skills. As shown in Table 1, the grand classroom mean of literacy skills was 2.5 (ranging from 1.67 to 3.31,  $SD = .34$ ). Cronbach's alpha for this sample was .95.

**Table 2**  
**Descriptive Statistics for Quality of Structural Literacy Environment:**  
**Book Materials**

Item	Scale range					
	1 (0-1)		2 (2-3)		3 (4+)	
	Frequency	%	Frequency	%	Frequency	%
1. Number of narrative picture books	2	3.7	4	7.4	48	88.9
2. Number of electronic books	51	96.2	1	1.9	1	1.9
3. Number of information books	8	14.8	20	37.1	26	48.1
4. Number of alphabet books	34	63	13	24	7	13
5. Number of poetry/rhyme books	20	37	23	42.6	11	20.4
6. Number of concept books (shape, colors)	17	31.5	22	40.7	15	27.8
7. Number of books on current theme	15	27.8	7	13	32	59.2

## Results

### Research Aim 1: To Characterize the Quality of the Literacy Environment in ECSE Classrooms

The classroom literacy environment is composed of the *structural environment* (e.g., books, writing materials) as well as the *instructional environment* (e.g., the literacy-focused interactions between teachers and children). In the present study, the structural literacy environment was examined using the CLOP, with specific examination of availability of book materials (see Table 2) and availability of print and writing materials (see Table 3).

*Book materials.* As shown in Table 2, almost all of the 54 classrooms had a minimum of four narrative books (88.9%) but lacked electronic books (96.2% had 0-1 books). The other categories were more varied. For informational books, almost half of the classrooms had a minimum of four books (48.1%), whereas very few classrooms had no books or one book (14.8%). A reverse pattern was found for alphabet books; the majority of classrooms had no books or one book (63%), whereas very few had four or more books (13%). For poetry/rhyme books and concept books, the distribution was the widest. Approximately one third of classrooms had no books or one book in the poetry/rhyme and concept genres (37% and 31.5%, respectively), whereas approximately 20% and 28%, respectively, had four or more books. The slight majority for poetry/rhyme and concept books was for classrooms to have two to three books of each type (42.6% and 40.7%, respectively).

*Print and writing materials.* Print and writing materials were limited in most classrooms (see Table 3). The vast majority of classrooms had no literacy or language-related computer games (78%) and no displays of child-dictated writing (72%). The majority of classrooms also were rated as having few (1-3 materials) different types of writing tools in the writing center (70%), few displays of the entire alphabet (74%), and few displays of children's names (78%). For the remaining items, approximately half of the classrooms had few (1-3

**Table 3**  
**Descriptive Statistics for Quality of Structural Literacy Environment-Print and Writing Materials**

Item	Scale range							
	1 (0)		2 (1-3)		3 (4-6)		4 (7+)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
1. Literacy or language-related computer games	42	78	8	15	3	5	1	2
2. Paper/writing media in the writing center	2	4	31	57	13	24	8	15
3. Writing tools in the writing center	1	2	38	70	15	28	0	0
4. Word/letter puzzles	16	30	30	55	7	13	1	2
5. Alphabet depicted in the room	12	22	40	74	2	4	0	0
6. Print materials	0	0	27	50	13	24	14	26
7. Child-generated writing	25	46	29	54	0		0	
8. Child-dictated writing	38	70	15	28	1	2	0	0
9. Children's names displayed	1	2	42	78	10	19	1	2
10. Literacy-related props	31	57	14	26	3	6	6	11

	Scale range			
	1 (Yes)		0 (No)	
	Frequency	%	Frequency	%
11. Writing center	48	89	6	11
12. Writing in centers other than a writing center	27	50	27	50
13. Written words, labels, and/or a word wall	31	57	23	43
14. Writing portfolios built by children	17	31	37	69
15. Audio center	26	48	28	52

materials) materials available in the following categories: different literacy props in the housekeeping/play areas (57%), different types of paper or writing media in the writing center (57%), word or letter puzzles (55%), and print materials, such as birthday charts, visible in the classroom (50%). For the dichotomous items, the majority of classrooms had a dedicated writing center accessible to children (89%), but there was no evidence that children were building writing portfolios (69%). Approximately half of the classrooms had writing materials accessible to children in nonwriting centers (e.g., science or art center; 50%); had written words, labels, or a word wall visible in the rooms (57%); and had a working audio center available to children (48%).

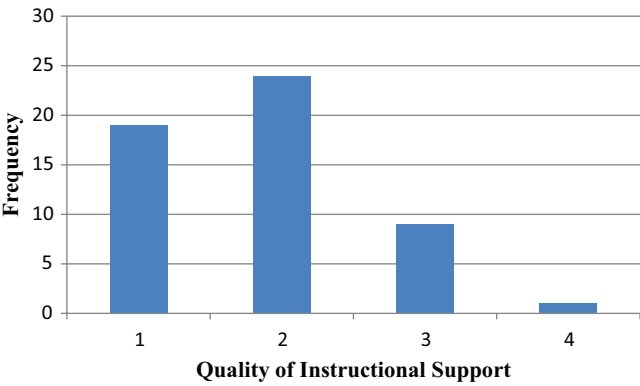
*Instructional literacy environment.* Table 4 provides the descriptive statistics for the classrooms' instructional literacy environment, as rated by the instructional support domain of the CLASS. As described previously, each dimension is scored from 1 to 7, spanning a continuum of quality such that 1 or 2 indicates low quality; 3, 4, or 5 indicates mid quality; and 6 or 7 indicates high quality (see R. C. Pianta et al., 2008). The average instructional support rating was 2.26 ( $SD = 0.77$ ). Figure 1 depicts the distribution of scores along the rating continuum. Three quarters (78%) of the classrooms received low ratings on instructional support (i.e., 42 out of 54 classrooms received ratings of 1 or 2). No classrooms were coded as providing a high

**Table 4**  
**Descriptive Statistics for Quality of Instructional Literacy Environment**

Item	<i>M</i>	<i>SD</i>	Range
Concept development (CD)	2.29	0.81	1-4.3
Quality of feedback (QF)	2.32	0.90	1-4.7
Language modeling (LM)	2.16	0.84	1-5
Instructional support	2.26	0.77	1-4

*Note.* Instructional support = mean of CD, QF, and LM.

**Figure 1**  
**Frequency Distribution of Scores on the Quality of Instructional Literacy Environment (Instructional Support)**



*Note.* 1 or 2 represents low-level quality of instructional support; 3, 4 or 5 represents mid-level quality; 6 or 7 represents high-level quality.

level of instructional support (i.e., rating of 5 or above). The mean scores for all three subscales of instructional support were consistently low: 2.29 ( $SD = 0.81$ ) for concept development, 2.16 ( $SD = 0.84$ ) for language modeling, and 2.32 for quality of feedback ( $SD = 0.90$ ).

**Research Aim 2: To Examine the Contributions of Teacher and Classroom Factors to the Quality of the Literacy Environment**

To address the second research aim, we first computed correlations to examine the inter-relationships among the quality of the literacy environment and the factors of teachers and classrooms (see Table 5). Overall, the quality of the literacy environment was not strongly associated with factors of teachers or classrooms. Only two significant correlations were noted. The quality of the structural literacy environment was negatively correlated with the number of children who were DLLs in the classroom ( $r = -0.41, p < .05$ ), and the quality of the instructional literacy environment was positively correlated with teacher education ( $r = 0.31, p < .05$ ). In addition, the average level of literacy skill among children in a classroom was significantly and negatively correlated with the number of children with IEPs.



**Table 5**  
**Correlation Between Teacher Characteristics, Classroom Characteristics, and Quality of Literacy Environment**

Variable	1	2	3	4	5	6	7	8	9
Structural literacy environment	—	-.01	.10	.08	.16	.04	-.10	.10	-.41*
Instructional literacy environment		—	.31*	.15	-.20	.13	-.03	.11	.11
Teacher education			—	-.06	.04	-.11	-.21	.20	-.16
Years of preschool teaching				—	.02	.01	-.07	-.14	.05
Workshops-language and literacy					—	.21	.10	.01	-.18
Teacher self-efficacy						—	-.08	-.13	-.13
Number of children with IEPs							—	-.28*	-.14*
Children's literacy skills								—	-.11
Number of children who are DLLs									—

*Note.* IEP = individualized education plan; DLLs = dual-language learners.

\* $p < .05$ .

To more explicitly examine the relation between teachers and classrooms and the quality of literacy environment, we conducted two multiple regression models. As indicated in Table 6, separate regression models were run for each aspect of the literacy environment (i.e., structural and instructional environments), and each regression model included all seven teacher and classroom predictors. The structural literacy environment was significantly associated with only one classroom factor, namely the number of children who were DLLs. Specifically, classrooms with a higher number of children who were DLLs had a lower quality structural literacy environment ( $\beta = -0.55, p = .015$ ). Approximately 26% of the total variance in the quality of the structural literacy environment was explained by the examined teacher and classroom factors.

The quality of the instructional literacy environment (instructional support) was significantly associated with three teacher factors (teacher education, number of language and literacy workshops attended, and self-efficacy). First, teachers' level of education was positively associated with instructional support, such that teachers with master's degrees received significantly higher ratings of instructional support compared with teachers without master's degrees ( $\beta = 0.38, p = .007$ ). Second, teachers with higher self-efficacy received significantly higher ratings of instructional support ( $\beta = 0.4, p = .007$ ). Last, teachers who attended more workshops or trainings that addressed children's language and literacy development received lower ratings of instructional support ( $\beta = -0.39, p = .012$ ). In total, 36% of the variance in the quality of the instructional literacy environment was explained by the examined teacher and classroom factors.

## Discussion

In the present study we sought to characterize the quality of the structural and instructional literacy environment in inclusive ECSE classrooms and to examine whether select

**Table 6**  
**Teacher and Classroom Characteristics Associated With Quality of Literacy Environment**

Factor	Structural literacy environment		Instructional literacy environment	
	$\beta$	$p$	$\beta$	$p$
Teacher characteristics				
Teacher education (master's degree or not)	-0.12	.530	0.39**	.007
Teaching experience	0.11	.566	0.13	.337
Number of workshop in language and literacy	-0.01	.994	-0.38*	.012
Teacher self-efficacy	-0.09	.663	0.40**	.007
Classroom characteristics				
Number of children with IEPs	-0.01	.987	0.15	.300
Children's literacy skills	-0.09	.663	-0.04	.782
Number of children who are DLLs	-0.51*	.015	0.15	.289
Total variance explained ( $R^2$ )	0.26		0.36	

Note. IEP = individualized education plan; DLLs = dual-language learners.

\* $p \leq .05$ . \*\* $p \leq .01$ .

teacher and classroom characteristics were related to the quality of the literacy environment. The study produced three primary findings of interest.

First, study results indicated that the structural literacy environment of ECSE classrooms, including books and print and writing materials, was generally of low to moderate quality. Narrative books dominated the collections available in the majority of the classrooms studied, with limited availability of books constituting other text genres (i.e., information, alphabet, poetry, and concept books). Also absent in most of these inclusive ECSE classrooms were electronic books. These findings are in accordance with earlier studies suggesting that the vast majority of the books available in typical preschool classrooms are narrative picture books (e.g., McGee, 2007; Pentimonti, Zucker, Justice, & Kaderavek, 2010). Our data suggest that the same holds true for inclusive ECSE classrooms. This is a finding of note, given that access to a variety of book genres can accommodate the reading interest of all the children in a classroom, including those with disabilities (Fractor et al., 1993; Katims & Pierce, 1995).

Regarding the quality of print and writing materials, the majority of the inclusive ECSE classrooms studied were also found to provide only a limited number of print materials (e.g., displays of alphabet, children's names, letter puzzles, birthday chart, or writing media) and writing materials (e.g., writing tools). Although most of the classrooms provided a dedicated writing center, other materials, such as writing portfolios and written words/labels/word walls, were absent in half of the classrooms. Consistent with previous studies (e.g., McGee, 2007), our findings suggest that these ECSE classrooms provide children with only basic print and writing resources.

The results presented here generally converge with results from previous studies showing that the quality of the structural literacy environment in preschool or kindergarten classrooms was low or modest (Dunn et al., 1994; McGee, 2007; McGill-Franzen,

Allington, Yokoi, & Brooks, 1999). As described before, when classrooms are rich with literacy materials (e.g., books, posters, functional signs, writing implements), young children can use these materials to engage in meaningful literacy activities and facilitate their literacy development (Neuman & Roskos, 2007; Vukelich et al., 2012). Thus, the current structural literacy environment of these 54 inclusive ECSE classrooms may not be sufficiently powerful to promote children's literacy development, although this remains an empirical question.

Second, the quality of the instructional literacy environment (instructional support) of inclusive ECSE classrooms was found to be generally low. This finding was not entirely unexpected. Other studies using the CLASS found that many classrooms score low on instructional quality (e.g., Guo, Justice, et al., 2012; Justice, Mashburn, Hamre, et al., 2008; LoCasale-Crouch et al., 2007). In these studies, the average instructional support rating ranged from about 2 to 3.5; the average instructional support rating of the ECSE classrooms in the present study (2.3) falls within this range. Collectively, these findings indicate that the quality of the instructional literacy environment in inclusive ECSE programs appears to be comparable with that of typical preschool classrooms.

Third, several teacher- and classroom-level factors significantly predicted the quality of the literacy environment after controlling for all other teacher and classroom factors. Teachers' education level, reports of self-efficacy, and recent PD activities served to predict the quality of the instructional literacy environment, with the latter (PD activities) a negative predictor. One significant classroom-level predictor, the number of children who were DLLs enrolled in the classroom, significantly predicted the quality of the structural literacy environment.

Regarding the teacher-level factors, we found that the instructional literacy environment was positively associated with higher educational credentials. This finding adds to the body of evidence supporting the importance of teacher qualifications in providing a quality classroom environment (e.g., Buysse et al., 1999; Jeon et al., 2010). Another finding was that teachers who reported higher levels of self-efficacy received a higher rating for the quality of instructional support. This finding further supports the link between teacher self-efficacy and classroom quality (Guo, Connor, et al., 2012; Justice, Mashburn, Hamre, et al., 2008). Thus, a teacher with higher self-efficacy is more likely using more effective instructional strategies, such as more thorough development of concepts, provision of higher quality feedback, and modeling of more complex language, than teachers with lower self-efficacy.

The negative relation between the number of language and literacy workshops that teachers had attended and the quality of instruction support is paradoxical and surprising. It may be that the workshops in the area of language and literacy instruction did not incorporate sufficient evidence-based practices for teaching language and literacy; providing this critical content is certainly necessary to improve teachers' practices (e.g., Foorman & Nixon, 2006; Landry, Anthony, Swank, & Monseque-Bailey, 2009). In addition, if workshops were 1-day trainings with no follow-up mentoring or coaching, this type of PD is unlikely to be sufficient to change teacher behavior (Bradley & Reinking, 2011; Powell et al., 2010). We did not ask teachers to describe these language and literacy workshops, so we have no way of knowing the quality of the workshops that teachers attended. On the other hand, the finding may be interpreted on a more positive note. It is also possible that the teachers providing lower levels of instructional support sought out more PD than

teachers providing higher levels of support. Future research might examine the directionality of this finding.

The present study also demonstrated that a key classroom factor was related to the quality of literacy environment, specifically the number of children who were DLLs within a classroom. The potential explanation for the negative relation between number of DLLs and the structural literacy environment may be that DLL student enrollment is a proxy for poverty, which has been shown to be associated with lower classroom quality (R. Pianta et al., 2005). In the United States, DLLs disproportionately live in poverty (NCCP, 2010). The relation between the number of children who are DLLs and lower structural quality is unfortunate. The majority of school-age DLLs (i.e., 71% of fourth-grade students) read at below-basic levels as compared with only 31% of monolingual English speakers (NCES, 2009). The gap between weak and strong readers widens over children's schooling careers (Stanovich, 1986), so it is imperative to provide children who are DLLs with a strong foundation to build emergent literacy skills in their preschool years.

## Limitations and Future Directions

A number of limitations warrant comment. First, the findings obtained from the present study are correlational in nature. We cannot assume that the observed relations between teacher or classroom factors and the quality of the literacy environment are causal in nature. In addition, it should be noted that the detected associations were quite modest and need to be interpreted with caution.

Second, the purpose of our study was to characterize the quality of the literacy environment in inclusive ECSE classrooms and document teacher and classroom factors related to the quality of literacy environment. However, the study did not ascertain the relations between the nature of the classroom literacy environment and children's development over time. Such longitudinal work would be extremely important for advancing theory and practice.

Third, a concern regarding the sample size is warranted. Given that there were seven predictors in the regression model and only 54 classrooms were included, errors (i.e., type I error) associated with analysis may have arisen and led to faulty interpretations. Replication of our findings with a larger sample is needed.

Fourth, the instructional support domain of the CLASS measure, while useful for measuring the intended aspects of instructional quality, was not developed specifically to assess the quality of literacy instruction. For example, this measure does not capture the quality of literacy instruction targeting phonological awareness, alphabet knowledge, or vocabulary. There are undoubtedly facets of literacy instruction that are not captured by looking at more general pedagogical strategies (i.e., quality of concept development, feedback, and language modeling). Thus, future research should include a well-conceived, valid measure of the quality of literacy instruction.

Finally, also important but not examined in our study is whether organizational characteristics (e.g., program location and length) are related to the quality of the literacy environment for inclusive ECSE classrooms. We were confined in our analyses to the data collected as part of the larger study. However, prior work has found that important organizational characteristics (e.g., program location) may affect classroom quality and, in turn,

child achievement (e.g., Lee, Burkam, Ready, Honigman, & Meisels, 2006). Thus, research efforts to study the programmatic or organizational characteristics that affect the quality of literacy environment are important future lines of inquiry.

## Implications and Conclusions

Many teachers and parents believe that inclusive ECSE programs provide benefits to children with disabilities and peers who are typically developing (Stoneman, 1993). In reality, however, there are concerns about the quality of the literacy environment in inclusive (as well as typical) preschool programs, and whether the quality is sufficient to improve children's learning and development. In the present study, the quality of the structural and instructional literacy environment in the inclusive ECSE classrooms examined was shown to be low to moderate, suggesting that the literacy environment may not be sufficient to promote young children's literacy learning. Nonetheless, the results also pinpoint specific areas in which ECSE classrooms can be improved; this includes, for instance, broadening the types of books available to children, enriching the classroom with respect to print-related resources, and enhancing teachers' provision of instructional support to students. PD tailored to achieve these ends is likely to be an effective avenue to ensuring that ECSE classrooms support children's development of key literacy foundation.

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