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Ying Guo

*University of Cincinnati - Main Campus*

Brook E. Sawyer

*Lehigh University, lbs211@lehigh.edu*

Laura M. Justice

*The Ohio State University*

Joan N. Kaderavek

*University of Toledo*

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Quality of the Literacy Environment in  
Inclusive Early Childhood Special Education (ECSE) Classrooms

Ying Guo <sup>1</sup>, Brook Sawyer <sup>2</sup>, Laura M. Justice <sup>3</sup>, and Joan N. Kaderavek <sup>4</sup>

<sup>1</sup> University of Cincinnati

<sup>2</sup> Lehigh University

<sup>3</sup> The Ohio State University

<sup>4</sup> University of Toledo

### Abstract

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 characteristics 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. The number of children who were Dual Language Learners related to the quality of the structural literacy environment. The quality of the instructional literacy environment was positively associated with two teacher variables (teacher education and self-efficacy) and was negatively associated with one teacher variable (the number of language and literacy workshops attended). Implications are discussed.

## Quality of the Literacy Environment in

### Inclusive Early Childhood Special Education (ECSE) Classrooms

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). Over 48% of all preschoolers with disabilities are being 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., Burchinal et al., 2000; Peisner-Feinberg & Yazejian, 2010). One component of a high quality classroom is the literacy environment. The literacy environment, such as the number of books in the classroom and the instruction provided by the teacher, has been linked to children's emergent literacy skills (e.g., Guo, Justice, Kaderavek, & McGinty, 2012; Wasik & Bond, 2001). The 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 well as the greater risk that preschool children with disabilities, such as language impairment, will develop reading disabilities in elementary school (e.g., Catts, Fey, Tomblin, & Zhang, 2002). Research that has been conducted on the literacy environment of inclusive classrooms to date does not provide a comprehensive look at the multiple facets of a high quality literacy environment. Given the critical importance of emergent reading skills and the growing number of inclusive ECSE

classrooms, there is a need to further examine the literacy environment of inclusive ECSE classrooms.

To contribute to this limited literature, the present study examined the quality of inclusive ECSE classrooms, with a specific focus on describing the structural and instructional dimensions of the literacy environment and the potentially malleable factors that 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 upon these findings, particularly findings that show how classroom 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, Ann Beach, & Kontos, 1994; Early et al., 2007). In the present study, we examined the structural and instructional literacy environment. Numerous descriptive and experimental studies have found that both of these components contribute to the literacy development of children (e.g., Neuman, 1999; Neuman & Roskos, 2007; Wasik & Bond, 2001; Whitehurst & Lonigan, 1998).

The structural literacy environment dimension is comprised of the literacy materials that are available to children throughout the classroom setting (Wilson, 1987; Wolfersberger, Reutzler, Sudweeks & Fawson, 2004). A high quality structural literacy environment is rich in literacy artifacts, including 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). Considerable research has suggested that having a library which includes a variety of engaging books (e.g., genre, topics) fosters children's literacy skills (Dowhower & Beagle, 1998; Justice, 2006; Katims, 1995; Morrow, 2005; Neuman & Roskos, 2007; Vukelich et al., 2012). Providing books of different genres and topics addresses the learning needs and interests of all children in the classroom and cultivates an interest and motivation to read (Fractor, Woodruff, Martinez, & Teale, 1993; Vukelich et al., 2012). For example, 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; Kramer, McCabe, & Sinatra, 2012) as well as being well-suited to facilitating young children's reading interest, attention and engagement (Barrs & Pidgeon, 1994; Chapman et al., 2007). Additionally,

In addition to children's books, high-quality classrooms are print-rich classrooms, with functional print materials (e.g., posters, signs, teacher and child writing samples) and provide different writing tools and materials (e.g., pencils, crayons, paper, stamps) to promote a variety of writing experiences (Schickedanz & Casbergue, 2009; Vukelich, Christie, & Enz, 2012). The print and writing materials should be associated with the learning objectives and be used throughout the day to enhance children's literacy learning. Print materials are meaningful instructional resources because they are easy to read and provide children with valuable experience with early literacy skills (Prior & Gerard, 2004). Writing materials provide an environmental stimulus for writing (Schickedanz & Casbergue, 2009). For example, children could use paper and pencil in a grocery store center to make a grocery list or

provide a customer with a receipt. Empirical evidence has suggested that there are direct linkages between the print and writing materials and the literacy development of children (Snow, Burns, & Griffin, 1998), including children who are typically developing (e.g., Guo et al., 2012; Roskos, Christie, Widman, & Holding, 2010) and children with disabilities (Katims, 1994; Easterbrooks, Lederberg, & Connor, 2010).

The instructional literacy environment is operationalized as the strategies, such as classroom discussions and activities, teachers use to support children's literacy development (Hamre & Pianta, 2005; Justice, et al., 2008; Makin, 2003; Pianta & Hamre, 2009). Strategies which are 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., Kaiser & Hancock, 2003; Justice et al., 2008; Lonigan & Whitehurst, 1998; Pianta & Hamre, 2009; Snow, et al., 1998). In a multi-state study of prekindergarten programs, these practices were related to young children's language and literacy outcomes (e.g., Mashburn et al., 2008).

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

While important work has been done on 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 detailed information is needed about inclusive ECSE classrooms. To the best of our knowledge, no studies of inclusive ECSE classrooms provide specific information about *both* the structural and instructional dimensions of the literacy environment.

Several studies compared the global quality, including 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 brush look at the literacy environment but did not parse out the structural literacy environment from the instructional environment. For example, 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 and Hestenes et al. (2008) used the Revised ECERS (ECERS-R; Harms, Clifford, & Cryer, 1998/2005) to rate 459 inclusive ECSE classrooms and 854 typical preschool classrooms. The ECERS and ECERS-R are comprised of various subscales (e.g., Space and Furnishings, Interactions, Activities), including the Language-Reasoning subscale. The Language-Reasoning subscale provides a single value on a scale from 1 to 7 which represents the structural and instructional literacy environment (e.g., 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 Buysse et al. and Hestenes et al. found that inclusive ECSE classrooms had statistically significant higher ratings on the Language-Reasoning subscale than the typical classrooms. Practically speaking, the types of classrooms in both studies fell into 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 examining the instructional literacy environment in inclusive classrooms provides a detailed look at one specific component of the instructional environment. Smith and colleagues (2004) examined the type of language of preschool teachers in inclusive classrooms. They found that teachers seldom used high quality language facilitation techniques (i.e., linguistic mapping, expansion, imitation) with young children with disabilities and their peers. Soukakou (2012)



focused on the frequency and type of feedback preschool teachers in 45 inclusive classrooms in the United Kingdom provided to their students. On average, teachers received a 3.36 which represented a minimal score.

Research in typical preschool classrooms provides a more detailed look at the literacy environment. . These studies suggest that typical preschool classrooms offer inadequately developed structural (e.g., Dunn et al., 1994; McGee, 2007) and instructional literacy environments (e.g., Justice et al., 2008). In regard to the structural literacy environment, Dunn et al. (1994) found that of the 30 typical classrooms, only 30% included books/book areas and writing materials, while only 6% had letter cards or chalk and chalkboards for the purpose of writing instruction. In another recent study of typical preschool classrooms, McGee (2007) found that most had an adequate number of books, but books failed to include a diversity of genres; also, few classrooms had well-equipped writing centers or print-rich play areas. Researchers have found a similar pattern of low quality with respect to the instructional literacy environment of typical preschool classrooms (e.g., Girolametto, Weitzman, van Leishout, & Duff, 2000; Justice et al., 2008; LoCasale-Crouch et al., 2007; NICHD, 2002; Pianta et al., 2005). For example, Justice and colleagues (2008) examined the language (e.g., asking open-ended questions, use of advanced language) and literacy practices (i.e., explicit, purposeful, systematic instruction) in 135 typical preschool classrooms and found that few teachers demonstrated high quality practices.

The studies which have been conducted on the literacy environment of inclusive classrooms have resulted in inconsistent findings. Additionally, the focus or measured used has not permitted a detailed examination of the multiple facets (structural and instructional) of the literacy environment. Specific findings on the structural and instructional literacy environments of typical preschool programs

suggest much room for enhancement of the literacy environment. In response to the limited evidence available regarding inclusive ECSE classrooms and the importance of providing a high-quality literacy environment, one aim of the current study was to specifically assess both the structural and instructional components of the inclusive ECSE literacy environment.

### **Factors Associated with Classroom Literacy Environment**

Both teacher-level and classroom-level characteristics are predictors of overall classroom quality in early childhood classrooms, and it is important to examine these characteristics as they apply specifically to the literacy environment in ECSE classrooms. The majority of research that has examined factors related to classroom quality has been conducted in typical preschool classrooms. The demands of providing a high quality literacy environment may be greater in inclusive ECSE classrooms. For example, teachers in inclusive classrooms provide instruction to children with and without disabilities and thus must address a wider range of learning needs (Odom, 2000). Different teacher and classroom factors may be more salient to the literacy environment in inclusive classrooms than in typical preschool classrooms. Drawing on the findings from typical preschool classrooms, we examined four teacher characteristics and three classroom characteristics. Teacher-level characteristics included (a) teachers' education (i.e., formal years of schooling, (b) professional development experiences (c) teaching experience, and (d) self-efficacy beliefs. Classroom-level characteristics included (a) the number of children who have individualized education plans (IEPs), (b) classroom average-level literacy skills, and (c) the number of children who are Dual Language Learners (DLLs). DLLs refer to young children who are developing their primary language as they learn a second language (in this case, English; Gutiérrez, Zepeda, & Castro, 2010).

Some researchers argue that characteristics of early childhood teachers are of considerable importance in defining classroom quality (e.g., Buysse et al., 1999; Jeon, Langill, Peterson, & Luze, 2010). Previously examined teacher characteristics include years of teaching experience (e.g., U.S. Department of Education, 2001), teachers' education level (e.g., Cohen, Raudenbush, & Ball, 2003), participation in professional development training (e.g., Cohen & Hill, 2000), and teacher beliefs (i.e., self-efficacy; see Guo, Piasta, Justice, & Kaderavek, 2010). 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 both inclusive ECSE and typical classrooms who had bachelor degrees and more teaching experience in early childhood education provided a higher overall quality of classroom environment 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 indicate 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 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 link between teachers' participation in professional development (PD) and the quality of the classroom literacy environment. As an example, Justice et al. (2008) found a positive association between teachers' participation in language and literacy workshops and the quality of the instructional

literacy environment (teacher-child interactions) in typical preschool classrooms serving children at risk. Grace and colleagues (2008) also reported that structured PD training could significantly enrich the quality of the literacy environment of preschool classrooms. However, some PD studies indicate that participation in PD training is not sufficient to bring about significant changes in the quality of the instructional literacy environment (e.g., Justice, Mashburn, Pence, & Wiggins, 2008). Effective PD models 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 is teachers' judgment of their teaching capability. 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 et al., 2008). Moreover, teachers' sense of self-efficacy is also associated with their capacity and motivation to teach (Damon, 2007). Thus, some scholars contend that teacher self-efficacy should be considered as an important aspect of teacher quality (e.g., Guo, Connor et al., 2012).

The attributes of the classroom may also play important roles in shaping the quality of the classroom environment (e.g., Justice et al., 2008; Pianta, LaParo, Rayne, Cox & Bradley, 2002), particularly the composition of the classroom in terms of students' abilities. One way to characterize the overall skill level in the classroom is by the number of students with disabilities, commonly represented by the number of children with Individualized Education Plans (IEP). 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 et al., 2008), such that a higher quality instructional literacy environment was observed in classrooms with a higher percentage of children with IEPs.

The average literacy and language ability of children in a classroom also may be related to the quality of the literacy environment. Many studies have suggested that a higher quality literacy environment supports young children's language and literacy skills (e.g., Guo, Justice et al., 2012); however, little is known about how these skills may influence the quality of classroom literacy environment. Examination is needed to determine whether the average classroom literacy ability is related to the quality of the literacy environment.

As another classroom characteristic, we included the number of identified Dual Language Learners (DLL) in the classroom. DLLs comprise approximately 20% of the school-age population (Capps, Fixx, Ost, Reardon-Anderson, & Passel, 2004), with even higher percentages in preschool programs that primarily serve a low-income population, such as Head Start (28% DLLs; Administration for Children and Families, 2008). Though we were unable to identify any empirical evidence suggesting that the number of DLLs is associated with the quality of literacy environment, there is evidence indicating 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 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 children in

classrooms with higher enrollment of DLLs were provided high quality literacy experiences. Additionally, the number of DLLs in the classroom may be another way to represent the average level of classroom language ability; although without knowing how teachers/preschool programs classify children as DLLs, we recognize that it is an overgeneralization to assume that DLLs necessarily have lower language abilities (as measured by English language skills in the current study) than non-DLLs.

### **Summary and Study Aims**

As Buysse and colleagues (1999) pointed out, participation in inclusive ESCE 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 intervention or instruction, is likely to mediate the effectiveness of inclusive programs (Guralnick, 2001; Odom, 2000). Consequently, studies that improve our understanding of the quality of environment in inclusive ESCE classrooms are timely and warranted. The literacy environment is of particular interest given the importance of 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 characteristics to the quality of the literacy environment in inclusive ECSE classrooms.

### **Method**

The activities of the current study were nested within a of a larger multi-site experimental study of book reading practices. The main purpose of the larger study was to evaluate the impact of an early 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. Only the methods relevant to the current study are described.

### **Participants**

This study included 54 preschool teachers of inclusive ECSE classrooms located in a single Midwestern state. Participants were teachers who 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%). The majority of teachers held a graduate degree. Specifically, 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 one 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 ( $SD = 9.25$ ), with a range from one to 37 years. Most teachers reported using a state-developed curriculum ( $n = 44$ ), whereas less than one-quarter used a locally-developed (e.g., district) curriculum ( $n = 12$ ). One 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 ( $n = 10$ ). To capture classroom literacy activities, teachers were asked to rate how often they did select literacy activities in their classrooms using a 5-point scale, with 1 representing *less than one a week* and 5 representing *more than once a day*. The average rating for the frequency of book reading activities was 4.46, with a range of 4 to 5, indicating that almost all the classrooms had book reading activities every day. However, there was variability

across classrooms in terms of other literacy activities. The average rating for the frequency of phonological awareness activities (i.e., rhyme awareness) was 3.25, with a range of 1 to 5. The average rating of letter activities (i.e., letter names) was 3.92, with a range of 1 to 5. The average rating of name writing activities was 4.09, with a range of 1 to 5.

In the current study, a total of 439 children from these 54 classrooms participated. On average, eight children (4 children with disabilities, 4 typical peers), were enrolled per classroom (range of 4 to 10 children per classroom). Approximately 60% of the children were boys. 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 multi-racial. Children's average age was 3.9 years ( $SD = 0.7$  year; range: 3-5 years). In total, 54% of the children had IEPs. The majority of these children (46% of total sample) received speech-language intervention services. Eight percent of children had identified developmental disabilities which included 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 Dual Language Learners.

Maternal educational attainment varied. The highest level of education attained was eighth grade for 5.6 % of mothers, a high school diploma for 43.6%, an associate's degree for 7.8%, a bachelor's degree for 27.1%, a master's degree for 13.1%, and a doctoral degree for 2.8%. Almost half of families (46.5%) earned an annual household income above \$65,000 per year. Approximately one-quarter of the families earned either between \$30,000 - \$65,000 per year (27.7%) or less than



\$30,000 per year (25.8%). In the U.S., the median family income is \$49,445 (U.S. Census Bureau, 2011). Thus, our sample represented a slightly higher socio-economic status than the average U.S. family.

### **Procedures**

Recruitment began with classroom teachers. Teacher recruitment occurred in one-hour information sessions that were provided to teachers employed in local school districts. At the end of each information session, interested teachers were consented into the study.

The inclusive ECSE classrooms enrolled in our study served between 6 and 10 children with disabilities and up to six peers who are typically developing; this is the designated approach for the state in which this study was conducted but may not represent practices of all states. Sample recruitment procedures involved first seeking to consent all children within a classroom. We then used a teacher screening questionnaire to strategically sample for children with IEPs (indicating presence of a disability) and without IEPs ("typical peers"). Per classroom, we targeted up to six children with IEPs and four children without IEPs.

All data was collected concurrently in the fall of the school year. Caregivers completed a portfolio of questionnaires, including (a) a questionnaire documenting each family's demographic characteristics and (b) indirect assessments of children's emergent literacy skills. Caregivers were required to complete these questionnaires and mail them back to the research lab in a pre-addressed stamped envelope. Teachers were also required to complete a portfolio of questionnaires, including a questionnaire on demographic characteristics (i.e., education, teaching experiences) and beliefs (i.e., self-efficacy). Additionally, a systematic observation was conducted in each classroom to assess the quality of the classroom literacy environment.

## 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 CLOP is an observational measure that we developed by adapting the Early Literacy and Language Classroom Observation (ELLCO; Smith & Dickinson, 2002); we expanded the number of items examining the features of the structural literacy environment and improved the inter-rater reliability of the tool. (This tool is available from the author.)

For this study, we used the 22 items on the CLOP which 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.). These 22 items capture two aspects of the structural literacy environment: (1) *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 (2) *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 seven 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, seven are rated on a 4-point scale (1 = *0 materials*; 2 = *1-3 materials*; 3 = *4-6 materials*; 4 = *7 or more materials*) and five 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.

Inter-rater reliability was established by having two observers independently, but simultaneously, assess a randomly selected 20% of the sample. Inter-rater reliability was high, with intraclass correlation coefficients of .91.

**Instructional Literacy Environment.** The instructional support domain of *the Classroom Assessment Scoring System* (CLASS; Pianta, La Paro, & Hamre, 2008) was used to measure the instructional literacy environment. This domain focuses on how teachers effectively use classroom activities to support children's cognitive and language development (Pianta et al., 2008), and empirical evidence suggests that instructional support is directly related to 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 child learning and understanding. The language modeling dimension measures the quality and quantity of teachers' use of language-stimulation techniques. Dimensions are rated on a 1-7 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. Again, inter-rater reliability was determined by having two coders rate a randomly selected 20% of the total classroom sample. ; Inter-rater reliability was in accordance with the metric used by the CLASS developers, which is inter-rater agreement of 90%. The internal consistency (Cronbach's alpha) for the instructional support domain used in this study was .89.

**Teacher Characteristics Measure.** Teachers completed a questionnaire about their demographic information and beliefs and perceptions (i.e., self-efficacy).

Responses are represented in Table 1. Teacher education was recoded 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 (*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 climate. 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 Characteristics Measure.** For classroom characteristics, we included the 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 Dual Language Learners (DLLs). Characteristics of classrooms are presented in Table 1. The information about the number and percentage of children with IEPs and DLLs was reported by 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 language and 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 rated how often the child demonstrates the skills on a 4-point scale (i.e., 1=*Never*; 2 = *Sometimes*; 3 = *Often*; 4 = *Always*). The score for each child was created by computing the mean of all items. Cronbach’s alpha was .95. Because we hypothesized that the average child literacy ability of the 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 skills. As shown in Table 1, the grand classroom mean of language and literacy skills was 2.5 (ranging from 1.67 to 3.31, *SD* = .34).

## Results

### Research Aim 1: Quality of the Literacy Environment

Our first research aim was to describe the quality of the literacy environment in inclusive ECSE classrooms. Tables 2 and 3 present the descriptive statistics for structural quality; Table 2 describes the availability of book materials, and Table 3 describes the availability of print and writing materials. Table 4 describes findings regarding instructional quality, specifically instructional support based on CLASS.

**Structural literacy environment.** The structural environment includes the number and type of books as well as print and writing materials as measured by the CLOP.

**Books.** 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 zero books or one book (14.8%). A reverse pattern was found for alphabet books; the

majority of classrooms had zero 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 zero books or one book in the poetry/rhyme and concept genres (37% and 31.5%, respectively), whereas approximately one-fifth or one-quarter had four or more books (20.4% and 27.8%, respectively). The slight majority for both poetry/rhyme and concept books was for classrooms to have 2-3 books of each type (42.6% and 40.7%, respectively).

***Print and writing materials.*** Table 3 presents the descriptive statistics on classrooms' print and writing materials. Print and writing materials were limited in most classrooms. 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%), displays of the entire alphabet (74%) and displays of children's names (78%). For the remaining items, approximately half of the classrooms had few (1-3 materials) materials available in the following categories: (a) 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 non-writing centers (e.g., science or art center; 50%), had written words, labels (e.g., table, chair, specific center) or a word wall visible in the rooms (57%), and an obviously working (e.g., plugged in) audio center available to children (48%).

***Quality of the structural literacy environment.*** Based on observation studies (e.g., Smith & Dickinson, 2002), “no or few if any” indicate low quality, “some displays or indications” represent moderate or mediocre quality, and “many displays or indications” represent high quality. Using these classifications, results indicate that the quality of the structural literacy environment was low (for print and writing materials) to moderate (books) for this sample of classrooms.

**Quality of 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 indicate low quality; 3, 4, or 5 indicate mid quality; and 6 or 7 indicate high quality (see 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 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 ( $SD = 0.90$ ). The results indicate the quality of the instructional literacy environment was low.

## **Research Aim 2: Relation of Teacher and Classroom Characteristics to the Quality of the Literacy Environment**

Our second research aim was to examine the contributions of teacher and classroom characteristics to the quality of the literacy environment in inclusive ECSE classrooms. To address this aim, we first computed correlations to examine the

interrelationships among the quality of the literacy environment and the characteristics of teachers and classrooms (see Table 5). Overall, the quality of the literacy environment was not strongly associated with characteristics of teachers or classrooms. Only two significant correlations were noted. The quality of the structural literacy environment was negatively correlated with the number of DLL children in the classroom ( $r = -0.41, p < .05$ ), and the quality of the instructional literacy environment was positively correlated with teacher education ( $r = 0.31, p < .05$ ). Additionally, the average level of literacy skill at the classroom level was significantly and negatively correlated with the number of children with IEPs.

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 both aspects of the literacy environment (i.e., structural and instructional), and each regression model included all seven teacher and classroom predictors. The structural literacy environment was significantly associated with only one classroom characteristic variable, which was the number of DLLs. Specifically, classrooms with a higher number of DLLs showed a lower quality of the 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 characteristics.

The quality of the instructional literacy environment was significantly associated with three teacher characteristics (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 to



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 which 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 characteristics.

### **Discussion**

The aims of the study were to characterize the quality of the structural and instructional literacy environment in inclusive ECSE classrooms and to examine whether select teacher and classroom characteristics were related to the literacy environment. The current study produced three interesting findings, which we discuss here in addition to limitations of the study, suggestions for future research directions, and educational implications.

The first finding of this work was that the structural literacy environment, including books and print and writing materials, was of low to moderate quality. Regarding the quality of book materials, narrative books dominated the majority of inclusive ECSE classrooms. However, the number of books constituting other text genres (i.e., information, alphabet, poetry, and concept) was quite limited. Noticeably 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 or picture story books (e.g., McGee, 2007; Pentimonti, Zucker, Justice, & Kaderavek, 2010). Our data suggest the same holds true for inclusive ECSE classrooms. This is an important finding because a variety of book genres (e.g., story, information, alphabet)

accommodates the reading interest of all the children, particularly those with disabilities (Fractor et al., 1993; Katims & Pierce, 1995) and improves children's academic vocabulary and comprehension skills (e.g., Chapman et al., 2007; Kramer et al., 2012). Clearly, it is important as early childhood educators to provide children with high-interest books in variety of genres to promote different types of reading and learning opportunities and instill positive attitudes toward reading.

Regarding the quality of print and writing materials, the majority of the inclusive ECSE classrooms enrolled in the present study provided 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 classrooms provided a dedicated writing center, other materials, such as writing portfolios and written words/labels/word walls, were absent in half of classrooms. Consistent with the previous studies (e.g., McGee, 2007), our study suggests that these ECSE classrooms provide children with only basic print and writing resources.

Our first finding converges 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 et al., 1999). As described previously, 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, to promote 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. The second finding of this study was that the quality of the instructional literacy environment (instructional support) of inclusive ECSE

classrooms was low. This finding was not entirely unexpected. Other studies that also used the CLASS as a measure of instructional quality found that the quality of instructional support in typical preschool classrooms was low (e.g., Justice et al., 2008; LoCasale-Crouch et al., 2007; Guo, Justice et al., 2012). As described previously, the rating of 1 or 2 in the CLASS measure represents low quality, 3, 4, or 5 represents moderate quality, and 6 or 7 represents high quality. In these studies, the average instructional support rating ranged from 2.04 to 3.46 (Justice et al., 2008; LoCasale-Crouch et al., 2007; Guo, Justice et al., 2012), with our result of 2.26 falling at the lower end of this range. Taken together, these findings indicate that the quality of the instructional literacy environment in inclusive ECSE programs appears to be comparable to that of typical preschool classrooms.

The third noteworthy finding was that several teacher- and classroom-level characteristics significantly predicted the quality of the literacy environment. Specifically, three significant teacher predictors were identified, namely teachers' education level (i.e., formal education; dichotomous for master's degree), self-efficacy, and the number of language and literacy workshops attended by teachers (i.e., informal education). One significant classroom-level predictor, namely the number of DLL children enrolled in the classroom, was a significant predictor of the quality of the literacy environment.

Holding a master's degree was a positive predictor of the instructional literacy environment (i.e., quality of instructional support), when controlling for other teacher and classroom characteristics. 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 quality of

instructional support, when controlling for other teacher and classroom characteristics. This finding further supports the link between teacher self-efficacy and classroom quality (Justice et al., 2008; Guo, Connor et al., 2012).

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. We did not ask teachers to describe these language and literacy workshops. 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., Landry, Anthony, Swank, & Monseque-Bailey, 2009; Foorman & Nixon, 2006). Examples of evidenced-based practices include targeting specific vocabulary from books, the use of explicit and systematic literacy instruction, building language through rich conversation, facilitating critical thinking skills, and providing specific and informative feedback to expand children's learning and understanding. The instructional support domain of the CLASS, the measure used in the current study, included concept development, quality of feedback, and language modeling. Justice et al. (2008) found a positive relation between the quality of language modeling and teachers' participation in language and literacy workshops. Thus, it may be possible that the workshops attended by this sample of teachers did not target these critical instructional practices.

Additionally, if workshops were one day trainings with no follow-up mentoring or coaching, this type of PD is not likely to be sufficient to change teacher behavior (Bradley & Reinking, 2011; Powell et al., 2010). The PD literature also recommends the use of active and reflective learning opportunities during trainings (e.g., Dunst & Trivette, 2009). Given that we did not collect data on the specific

content and activities of language and literacy workshops, and the findings obtained from the present study were correlational in nature, further examination of the relation between in-service PD and classroom quality is needed.

The present study also demonstrated that a key classroom attribute was related to the quality of literacy environment. Specifically, the structural literacy environment was lower when the classroom was composed of a higher percentage of DLLs. This relation is unfortunate, because the majority of school-age DLLs (i.e., 71% of 4<sup>th</sup> grade students) read at below-basic levels, as compared to only 31% of native 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. We hypothesized that the number of DLLs may be another way to represent classroom language ability. However, for our sample, the number of DLLs in a given classroom was not significantly correlated with the average classroom language ability. Thus, given our data, it does not appear that the average language ability of children in a classroom explains any variance in the quality of the literacy environment. Another 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, and poverty has been shown to be associated with lower classroom quality (Pianta et al., 2005).

### **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 characteristics 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 the study was to characterize the quality of the literacy environment in inclusive ECSE classrooms and document teacher and classroom characteristics related to the quality of literacy environment. However, what remains unknown with our sample is the relation between the quality of literacy environment and literacy development for children with disabilities, which is a second limitation. Future plans include examining this obviously important relation.

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. Future longitudinal and experimental studies may shed more light on these associations.

Finally, also important but not examined in the current study is whether organizational characteristics (e.g., program location and length) are related to the quality of the literacy environment for inclusive ESCE classrooms. Previous researchers have found that preschool program location and the length of school day (full or half-day program) may improve classroom quality and, consequently, child achievement (Lee, Burkham, Ready, Honigman, & Meisel, 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**

In closing, many teachers and parents believe that inclusive ECSE programs provide benefits to both 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. The quality of the structural and instructional literacy environment in the inclusive ECSE classrooms examined in this study was low to moderate, suggesting that the literacy environment may not be sufficient to promote young children's literacy learning. Additionally, the present study identified several characteristics of teachers (education and self-efficacy) and classrooms (number of DLLs) that were related to the quality of the literacy environment. Given these findings, we suggest that more professional development (PD) efforts are needed to help teachers provide literacy-rich environments, both structurally and instructionally (e.g., types of books, print and writing materials, instructional interactions). For instance, teachers receive very little training on teaching DLLs (Russakoff, 2001). Practices that are recommended for improving the language and literacy skills of monolingual English speaking students are also recommended for DLLs, such as using contextualized language and modeling rich language (Tabors, 2008). Yet, we also know from our findings that simply providing literacy workshops may not be enough to bring about change. Professional development efforts need to be thoughtfully designed and implemented in terms of content (i.e., evidenced-based language and literacy practices) and process (e.g., opportunities for reflection on current practices and implementation of new practices, follow-up mentoring). By providing such PD efforts, teachers' self-efficacy may also improve.

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Table 1.

*Descriptive Statistics for Characteristics of Teachers and Classrooms*

	<i>M</i>	<i>SD</i>	Range
Teacher characteristics			
Teacher education (Master Degree or not)	.76	.43	0-1
Teaching experience	12.96	8.04	1-33
Number of workshop: language & literacy	1.37	.97	0-3
Teacher self-efficacy	3.85	.34	3-4.42
Classroom Characteristics			
Number of Children with IEP	5.8	1.67	1-11
Proportion of Children with IEP	0.37	0.10	0.06-0.69
Children’s emergent literacy skills	2.5	.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; CLOP = The Classroom Literacy Observation Protocol; CLASS = The Classroom Assessment Scoring System; DLLs = Dual language learners; IEP = individualized education plan.

Table 2.

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

	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%

Table 3.

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

	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%

Table 4.

*Descriptive Statistics for Quality of Instructional Literacy Environment*

	M	SD	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



Table 5.

*Correlation between Teacher Characteristics, Classroom Characteristics, and Quality of Literacy Environment*

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

Note. \*  $p < .05$

Table 6.

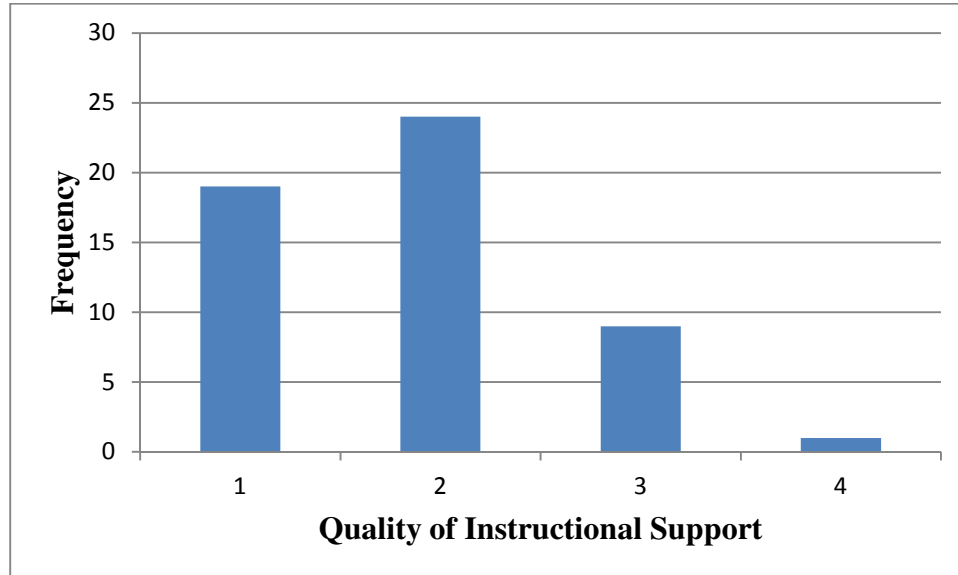
*Teacher and Classroom Characteristics Associated With Quality of Literacy Environment*

	Structural literacy environment		Instructional literacy environment	
	$\beta$	$p$	$\beta$	$p$
Teacher characteristics				
Teacher education (Master 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 <sup>2</sup> )	0.26		0.36	

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

Figure 1.

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



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