

Relating Preschool Quality to Children’s Literacy Development

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Abstract Preschool classrooms were investigated to determine the extent to which quality is related to children’s literacy development. The study included 24 classrooms of 428 prekindergarten children in a large, urban Midwestern school district. Results suggest that global classroom quality and literacy environment quality are strongly related. Literacy environment quality and children’s literacy abilities are also related. Differences in classroom quality were found to have an impact on children’s literacy scores—the higher the quality, the higher the scores. This article also describes lessons learned from the investigation and provides suggestions for teachers and administrators for improving quality to enhance literacy development.

Keywords Early literacy · Classroom quality · Literacy environment quality

Early childhood programs located in urban areas struggle to provide high quality education for preschool-age children (Snow et al. 1998). Determining the quality of these early childhood classrooms and the impact this quality has on children’s literacy development also appears to be a challenge (Early et al. 2007). The importance of early childhood experiences with rich language input and appropriate exposure to the use and functions of print was emphasized by a series of national organizations in the late 1990s. For example, the International Reading

Association (IRA) and the National Association for the Education of Young Children (NAEYC) jointly issued a position statement emphasizing the appropriateness of providing rich language and literacy experiences in preschool classrooms (IRA and NAEYC 1999). Further, a report from the National Academy of Sciences entitled, *Preventing Reading Difficulties in Young Children* (Snow et al. 1998), asserts that attention to young children’s literacy environments during the preschool years constitutes the foundation of a critical prevention effort for children at risk for reading difficulties. They conclude that preschool classrooms serving at-risk children are often impoverished in providing rich language and literacy environments.

The overall (global) quality of an early childhood classroom has been found to have positive effects on language and literacy skills (Dickinson et al. 2006). Several major studies that evaluated global classroom quality have found that classrooms scoring higher on quality indicators are more likely than classrooms of lesser quality to benefit preschool-age children’s language, literacy, and cognitive development (e.g., Bryant et al. 1994; Campbell et al. 2002; Early et al. 2007). Global quality is defined as “that which is most likely to support children’s positive development,” such as developmentally appropriate learning activities, safe and healthy environments, and positive and appropriate interactions between adults and young children (Cost, Quality, and Child Outcome Team 1995, p. 1). Although global quality has been shown to have an impact on young children’s literacy development, more research is needed on specific quality indicators associated with early literacy skills.

The key to early literacy development is a rich, well-organized environment that can support teachers’ goals for children—in other words, a high quality literacy

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environment (Hoff 2006). Literacy environment quality includes the environment and social relationships directly encountered by the children participating in a classroom (Smith and Dickinson 2002). To date, minimal research has been done in the area of literacy environment quality. This study seeks to investigate both the physical classroom environment and instructional practices in an effort to determine the extent to which classrooms are providing optimal support for literacy development.

Rationale for the Study

Significant relationships exist between global preschool quality and children's development. However, further research to determine the possible links between literacy environment quality and preschool children's literacy development is required. In addition, research linking the quality of public school preschool environments and children's development is missing. Child care centers and Head Start programs have dominated the existing body of research. Also, previous studies indicate that children from low-income families are often considered at-risk for later reading difficulties (e.g., Burchinal et al. 2000). Further research comparing the literacy development of economically at risk children and literacy environment quality is required.

This study explored the relationship between literacy environment quality and *public school* preschool children, as well as literacy environment quality variability on the literacy development of preschool children. Further, the differences between literacy skills of children identified as at risk due to economic factors (eligibility for free or reduced meals) and those children who are not is examined. Finally, the differences in children's literacy skills related to the variability of the literacy environment quality is investigated, with particular interest in the proportion of children scoring at or below the 50th percentile on the language and literacy measure in each quality rating.

The Study

Participants

Prekindergarten students from a large urban, Midwestern school district were the focus of this study. A convenience sample of 24 intact classrooms representing 428 children was used. Over 80% of the sample qualified for free/reduced meals and 74% were African-American children. The racial, cultural, and economic diversity of the district's student population was well represented by the sample.

Data Collection

Data were collected from three sources: a student assessment, the Teacher Rating of Oral Language and Literacy (TROLL; Dickinson 1997); and two observational surveys: the Early Childhood Environment Rating Scale-Revised (ECERS-R; Harms et al. 1998) and the Early Language and Literacy Classroom Observation (ELLCO; Smith et al. 2003).

The ECERS-R has been used in the measurement of early childhood environments for over 20 years. The scale assesses seven subsections: (a) Space and Furnishings, (b) Personal Care Routine, (c) Language/Reasoning, (d) Activities, (e) Interaction, (f) Program Structure, and (g) Parents and Staff. There are 43 items (470 indicators) rated using a seven-point scale format, with descriptors for 1 (Inadequate), 3 (Minimal), 5 (Good), and 7 (Excellent). A certified ECERS trainer provided training for literacy coaches in the district. As part of this training, inter-rater coefficients were established. Coefficients of .95 exact agreement and .97 within-one-point were established, which are well above the recommended level (Harms et al. 1998). The ECERS-R was used to assess the global quality of the district's preschool classrooms.

The ELLCO Toolkit was used to assess the quality of the literacy environments. The ELLCO Toolkit provides three separate tools for describing the extent to which classrooms support literacy development: (a) Literacy Environment Checklist, (b) Classroom Observation, and (c) Literacy Activities Rating Scale. However, only the Classroom Observation has been used in research concerned with indicators of classroom quality and the enacted curriculum focusing on early language and literacy development (Smith et al. 2003). The Classroom Observation contains 14 items conceptually grouped into two dimensions, General Classroom Environment and Language, Literacy, and Curriculum. A 5-point scale accompanies each item and uses the descriptors of 5 (Exemplary), 4 (Proficient), 3 (Basic), 2 (Limited), and 1 (Deficient).

Literacy coaches were provided training by a certified ELLCO trainer. Inter-rater reliability was determined following the training. Coefficients of .97 for exact agreement and .99 for within-one-point agreement were established. These were well within the recommendations of the ELLCO authors (Smith and Dickinson 2002).

The TROLL assesses children's essential literacy skills of language, reading, and writing and requires no specialized training. Low-income, high-risk children were used for the norming group (CIERA 2001), which was appropriate for the present sample.

The TROLL relies on a teacher's professional judgment of a child's development rather than formal testing of actual development. Nonetheless, TROLL ratings are

largely consistent with those obtained through formal assessment. Correlations were found between the TROLL and these measures: (1) Peabody Picture Vocabulary Test III (Dunn and Dunn 1981), (2) the Emergent Literacy Profile (Dickinson and Chaney 1997), and (3) the Early Phonemic Awareness Profile (Dickinson and Chaney 1997). Teacher ratings of children's literacy development on the TROLL show moderate correlation with children's scores on all three of the aforementioned formal tests (.43–.47 with $p < .001$).

Procedure

Early in the school year, the school district's Early Childhood Education Director (ECED) communicated a desire to include the preschool classrooms in the district's literacy initiative. To this end, professional development workshops were planned for district literacy coaches that specifically addressed best practices for preschool literacy instruction and improving the preschool environments. The ECED purchased the materials necessary for training literacy coaches to use the ECERS-R and ELLCO. Early in the second semester of the school year, professional development opportunities were provided for training to use these instruments. Six literacy coaches, out of 46, elected to participate in the ECERS and ELLCO training.

The ECERS-trained literacy coaches were asked by the ECED to observe the preschool classroom(s) in their building and others located geographically close to their school if the literacy coach from that school had not attended the ECERS training. In early May, 31 preschool classrooms were observed and rated using the ECERS. Global quality ratings for each classroom were determined. Approximately 2 weeks later, ELLCO-trained literacy coaches observed 24 of the 31 previously observed classrooms. Literacy environment quality ratings were determined.

Teachers were asked to complete a TROLL for each prekindergarten student enrolled in their preschool classroom by the end of May. TROLL assessments were completed for children in 40 classrooms. The TROLL provided literacy scores for individual prekindergarten children.

Out of a total of 79 preschool classrooms, 24 returned all three data sources—the ECERS, the ELLCO, and the TROLL. These 24 preschool classrooms became the sample for this study.

Findings

Data analysis of the ECERS-R revealed a mean score of 212 for the sample. According to the quality ratings established by the Cost, Quality, and Outcomes Study

(1995), a score of 212 is classified as providing Minimal or "Mediocre" *global quality*. The ELLCO mean score of 44.44 for the 24 preschool classrooms was identified as "Basic" *literacy environment quality*. A TROLL mean score of 73.23 was calculated for the sample. Based on the developmentally appropriate literacy skills at different age levels for preschool children, a 5-year-old child who scored a 73 would fall at the 25th percentile (Dickinson 1997).

Global Quality and Literacy Environment Quality

A Pearson r correlation was calculated using the ECERS-R and the ELLCO. The correlation revealed there was a significant and positive relationship between the ECERS-R (global quality) and the ELLCO (literacy environment quality) [$r(24) = +.68, p < .000$]. This indicates items identified as measuring the global quality of a classroom (e.g., space and furnishings, personal care routines, language-reasoning, activities, program structure, and provisions for parents and staff) are related to the items identified as measuring the quality of the literacy environment (e.g., contents of the classroom, opportunities for child choice, approaches to reading and writing, oral language facilitation). Overall, as the global quality of a classroom increases, the literacy environment quality proportionately increases.

Literacy Environment Quality and Literacy Development

A Pearson r was calculated using the ELLCO Classroom Observation and the TROLL to determine the relationship between the quality of preschool literacy environments and children's literacy development. A significant, positive correlation was found [$r(428) = +.35, p < .000$]. This result indicates a relationship between literacy environment quality and students' literacy achievement. The analysis suggests a moderately significant relationship. As the literacy environment quality increases, it appears that the TROLL scores tend to increase. This would indicate that improvement in literacy environment quality could have a positive impact on literacy development.

Literacy Development in Students At-Risk

An Independent Measures t -Test compared TROLL scores of students who qualified for free/reduced meals (students at-risk) and those having full pay meal status (students not at-risk). A total of 346 students (8.8%) were identified as receiving free or reduced-priced meals. Students at-risk had a mean TROLL score of 71.53 ($SD = 14.67$), a score that falls at or below the 50th percentile. The remaining 82

students (not at-risk) received a TROLL mean score of 8.44 (SD = 11.97). The *t*-Test revealed a significant difference [$t(426) = 5.11, p < .000$, equal variances] between the scores of students identified as at-risk and those without the risk factor. This indicated that influences from a low-income background have a negative impact on children's literacy development, a finding supported by numerous other research studies (e.g., Burchinal et al. 2000).

Quality Variability and Literacy Development

An investigation into the difference between the literacy development of prekindergarten children participating in classrooms with variable literacy environment quality required establishing quality rating categories. The anchor categories of Deficient, Basic, and Exemplary from the ELLCO were used.

The TROLL scores of children enrolled in classrooms with variable quality were compared using a one-way analysis of variance (ANOVA). The ANOVA indicated a significant, positive difference [$F(2,425) = 23.24, p < .000$, equal variances] between the TROLL scores of children enrolled in the three classrooms.

Post Hoc analyses indicated a significant difference between scores of children in classrooms rated Deficient ($M = 65.39$; $SD = 12.59$) and Basic ($M = 74.96$; $SD = 14.32$), as well as Deficient and Exemplary ($M = 78.37$; $SD = 14.16$). No statistical difference was found between the scores of students enrolled in Basic and Exemplary classrooms.

Further analyses investigated the impact of a child's risk status, literacy development, and literacy environment quality. This investigation was important since the sample had high numbers of students at-risk. In addition, it was found that students at-risk in this study had significantly lower TROLL scores than non at-risk students. A one-way ANOVA was conducted with the TROLL scores of students with full pay meal status (non at-risk) in each of the ELLCO quality ratings. A significant difference was found between the three quality ratings [$F(2,81) = 8.18, p = .001$, equal variances]. Post Hoc tests revealed differences existed between the scores of children in Deficient ($M = 45, SD = 25.16$) and Basic ($M = 69.25, SD = 22.64$) classrooms, as well as between Deficient and Exemplary ($M = 76.59, SD = 21.78$) classrooms. However, there was no statistical difference between the scores of children in Basic and Exemplary-rated classrooms. This is the same net result as the full sample. Analyses of scores from students at-risk revealed different findings. A one-way ANOVA showed there was a significant difference between the groups [$F(2, 345) = 22.92, p = .000$, equal variances]. Post Hoc tests indicated there were significant differences in the scores of students at-risk among all three

quality ratings: Deficient ($M = 3.61, SD = 23.08$), Basic ($M = 48.71, SD = 27.54$), and Exemplary ($M = 59.70, SD = 27.69$). These results clearly indicate that increasing the quality of the literacy environment increases the literacy scores of students at-risk.

Figure 1 graphically illustrates the quality ratings of preschool literacy environments and at-risk children's literacy scores.

A chi-square cross tabulation was performed to determine proportions of students scoring at or below the 50th percentile for each quality rating. There were 103 students enrolled in classrooms rated as Deficient with 89% identified as at-risk. There were 88 children (85.4%) who scored at or below the 50th percentile. Of the students who were enrolled in classrooms that were rated as Basic, 253 (82%) were identified as at-risk. In Basic-rated classrooms, 150 children (59.2%) scored at or below the 50th percentile. Exemplary-rated classrooms had 72 students enrolled, with 30 students (41.6%) scores at or below the 50th percentile. A total of 69% of these students in Exemplary-rated classrooms were identified as at-risk. There was a proportionately higher number of students scoring at or below the 50th percentile than scoring above the 50th percentile, not only in classrooms rated as Deficient but Basic classrooms as well (Deficient 85.4%, Basic 59.2%, Exemplary 41.6%). Data also revealed that a much smaller proportion of children enrolled in classrooms rated as Deficient scored above the 50th percentile on the TROLL (15 students) than students who scored at or below the 50th percentile (88 students). In addition, the data suggested that the largest proportion of preschool students with TROLL scores above the 50th percentile were enrolled in classrooms with quality ratings of Exemplary (Fig. 2).

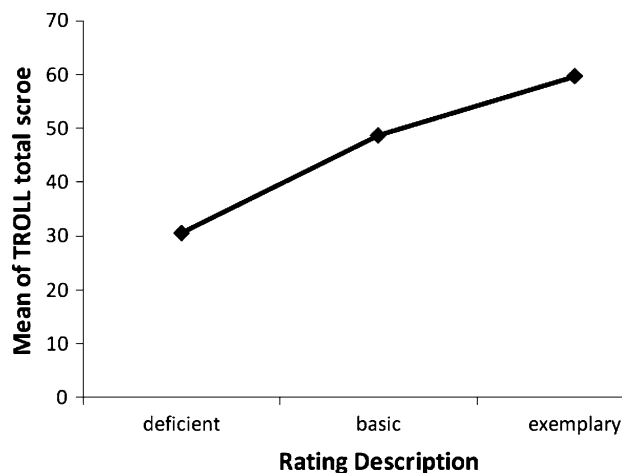


Fig. 1 At-risk students TROLL scores by quality ratings

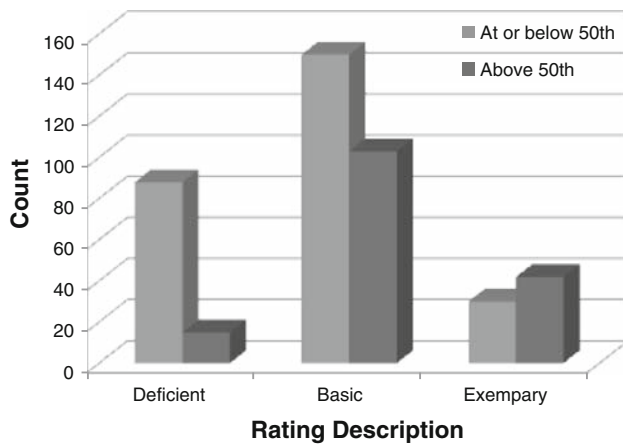


Fig. 2 Proportion of students at or below 50th percentile by quality rating

Lessons Learned

Global Quality in Preschool

This study indicated the global quality of the preschool classrooms in this school district was considered Mediocre. Private child care and Head Start facilities have been making steady progress toward increasing program quality. Outside of accreditation through state departments of elementary and secondary education that typically do not involve public school preschool classrooms, the use of program evaluations to investigate quality may be an unfamiliar concept for public schools. Improvement of the global quality of these classrooms would be an investment in the success of the school district. This scenario can also be looked at from another perspective. Ignoring the quality offered to marginalized populations in preschool could be impairing the language, literacy, and cognitive development of these children, which continues to widen the achievement gap in our urban schools. Qualitative data gathered during the ECERS observations suggest:

Administrators Can

- Provide more support for families. Families should be given information about the preschool (e.g., curriculum, structure, routine) in writing. Families need numerous and varied opportunities to participate in their child's education.
- Provide age-appropriate outdoor play facilities. Public school playgrounds are not typically designed for the needs of preschool children. Safety considerations, such as height of structures and resilient surfaces in fall zones, must be considered.

Teachers Can

- Utilize appropriate discipline strategies. The interactions teachers and children have are integral to both learning and development. The use of positive guidance approaches and providing choices for children are encouraged.
- Provide adequate time for free play/choice. A minimum of 1-h should be spent in self-selected centers or small group activities in which children can move freely about the room and choose the toys and materials with which they want to play.

Literacy Environment Quality in Preschool

The literacy environment quality of the public school preschool classrooms in this study indicated these learning environments provided Basic support for children's literacy development. At face value, Basic support seems adequate. However, nearly two-thirds of the children in these classrooms scored at or below the 50th percentile on the TROLL. Only in those classrooms rated as providing Exemplary support for literacy development did less than half of the children score at or below the 50th percentile (42%). Only the Exemplary-rated classrooms had the largest percentage of children scoring *above* the 50th percentile at 58%. If nearly 60% of the children in Basic-rated classrooms are scoring below the 50th percentile, it is difficult to attest to the adequacy of this as a quality threshold. Furthermore, if we want to address the needs of our at-risk children, only Exemplary literacy environments provide the support necessary to raise literacy scores above the 50th percentile. Although more advantaged students can perform at satisfactory literacy levels in Basic-rated classrooms, students at-risk need the support of the highest quality literacy environment to be successful.

An analysis of Exemplary-rated classrooms revealed standards for learning environments that support literacy development. High quality, supportive literacy environments provided developmentally appropriate activities in which children could (a) make choices, (b) explore conceptual ideas, (c) experiment with social and academic language, (d) exchange ideas with peers and adults, and (e) make connections across an integrated curriculum. Qualitative data from the ELLCO suggest:

Teachers Can

- Provide exclusive book areas/libraries. Rather than share this space with activities such as circle time or

calendar, establish a separate area just for interactions with books.

- Evaluate your book selection. Make sure there is a nice *variety* (picture books, informational texts, wordless books) and *number* of books available (a minimum of 10 books per child should be in the book area).
- Make books accessible. Books should be available in *every* center/area (e.g., dramatic play, blocks, art, science). Avoid having books in closets or on shelves where children have no access.
- Display alphabet cards/charts at children's eye-level. Using alphabet cards as "decoration" at the edge of the ceiling discourages children from referring to them.
- Establish a writing center with a wide variety of writing instruments and paper to encourage writing for different purposes.

Conclusion

In order to understand how the environment influences children's literacy development potential, the environment must be explored. Research on specific features of the environment, such as the opportunities for developmentally appropriate learning activities, oral language facilitation, presence of books, and approaches to reading and writing, may provide valuable information. In particular, investigation of the quality of the environment to promote literacy in preschool is critical since early literacy skills at school entry may be viewed as particularly important.

The school district in this study, like many large, urban American school districts, had a high percentage of students who qualified for free/reduced meals. Children growing up in low-income households are more likely to have difficulties learning how to read than do children growing up in more advantaged households. These early disadvantages can have serious long-term effects on a child's academic potential. Research supports that a strong foundation of literacy development in the preschool years can predict an academically successful high school career (Campbell et al. 2002; Cunningham and Stanovich 1997). Therefore, attention to preschool children's success should become a priority. High-quality learning environments in preschool, specifically those that support language and literacy development, can help diminish these early disadvantages and promote the successful development of readers and writers. Sadly, this study revealed that the students who needed the most support and the highest quality learning environment, received neither. This unfortunate scenario is a familiar one in our nation's schools.

As a final consideration, it is important to bear in mind that *where* children learn and practice literacy affects how successful they will be as readers and writers. But it's not only a matter of place—or setting. It is also a matter of having the books available, opportunities to experiment and explore in a print-rich and stimulating oral environment, having a teacher knowledgeable about language and literacy development, engaging in meaningful choices about learning, and a classroom climate conducive for risk taking with a supportive, caring teacher. These are some of the things that influence literacy learning. They make up the social context of literacy. Taken together they form a literacy environment. If we want to be skillful in helping children become avid, willing, thoughtful, successful readers, we need to know how to create high quality literacy environments that enable them to meet their potential.

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