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Literacy Environment in Early Childhood Classrooms: Associations with Children's Engagement

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Abstract

This study examines associations between the literacy environment of early childhood classrooms and children's engagement. Children's language development relies on quality educational practices in preschool and kindergarten. The literacy environment includes a physical dimension (e.g., books, writing materials, environmental prints) and an interactive dimension (teacher-child and child-child interactions). Engagement refers to the quality of children's individual experiences, including teacher interactions, peer interactions, task orientation, and conflict interactions. Observations were conducted in 30 classrooms using the *Early Language and Literacy Classroom Observation Pre-K* (ELLCO Pre-K) to assess the literacy environment, along with the *Individualized Classroom Assessment Scoring System* (inCLASS) to assess 150 children's engagement. Findings show that the literacy environment was at a basic quality level, while children's engagement remained in the low range for teacher, peer, and conflict interactions, and in the medium range for task orientation. No significant associations were found between the literacy environment variables and children's engagement, but socioeconomic status, child age, and group size were associated with children's engagement. Results are discussed in light of early literacy teaching practices, supporting children's engagement, as well as how these findings can be incorporated in teacher training.

Keywords: early childhood education, early literacy, emergent literacy, engagement, literacy environment, interactions

1. Introduction

1.1 Supporting Children's Early Literacy

Early childhood classrooms are a gateway to the school system in Québec for 4- and 5-year-olds, with a mandate aimed at their educational success and preventive action (Carr et al., 2019; Ministère de l'Éducation [MEQ], 2023). A province-wide survey conducted with 5 324 teachers pertaining to children's development in kindergarten (Ducharme et al., 2023) highlights that 28.7% of children show vulnerabilities in at least one area of development, including language. Such a finding raises the importance of supporting children in their development and learning from preschool onwards to foster their present and future educational success (Duncan et al., 2007). Among the predictors most strongly associated with children's outcomes, early literacy lays the essential foundations for future learning during the elementary years (Carr et al., 2019; Charron et al., 2022).

The quality of teaching practices implemented to promote early literacy, which includes oral language, reading and writing, represents an essential part of the literacy environment of the classroom (Boudreau et al., 2022; Giasson, 2011; Rohde, 2015). The literacy environment encompasses an interactive dimension, including teacher-child and child-child interactions, and a physical dimension, which includes the layout of classroom areas, classroom prints, and writing materials available in the classroom (e.g., books, posters, paper, pencils, writing games). These two dimensions complement one another, and their interdependence supports early literacy in the classroom, as teachers' scaffolding is essential to promote the use of classroom materials and resources (Dynia et al., 2018; Guo et al., 2012). However, research in recent years points to a low or basic level of quality in terms of the literacy environment of early childhood classrooms. For example, classes observed contain few reading and writing materials (Lachapelle et al., 2024; Piasta et al., 2019; Zhang et al., 2015), and interactions between teachers and children around print seem rare (Charron et al., 2022; Drainville et Charron, 2021; Piasta et al., 2019; Thériault, 2010; Turgeon et al., 2021; Zhang et al., 2015). Together, these findings highlight the necessity to conduct further

research on early childhood classrooms' literacy environment, and determine how it can best support children's early literacy.

1.2 Child Engagement

Recent research has also shown that a second factor can directly influence children's educational success in early childhood classrooms, namely their engagement with their teachers and peers, and towards play and learning activities, including those in relation to early literacy (Baroody & Diamond, 2016). Children demonstrating high levels of engagement, showed by their positive communication and interactions with others, their enthusiasm and attentiveness during classroom activities, are more frequently exposed to rich learning opportunities (Bouchard et al., 2021; McWilliam & Casey, 2008; Reschly & Christenson, 2022), thus contributing to their language development (Aydoğan et al., 2015; Baroody & Diamond, 2016; Hume et al., 2016; Sabol et al., 2018; Vitiello et al., 2012). Furthermore, the quality of the classroom literacy environment appears to be associated with children's engagement (Aydoğan et al., 2015; Williford et al., 2013). Engagement represents a widely studied construct among older students, but it is only more recently that research has focused on engagement in the context of early childhood education (Williford et al., 2013). Given the importance that the literacy environment may have in relation to children's engagement, it seems pertinent to look at the potential associations between those two factors as they both have influence on children's early literacy experiences. The aim of this study is therefore to examine potential associations between the quality of the literacy environment in early childhood classrooms and children's level of engagement.

1.3 Previous Research on Early Literacy

Early literacy, also referred to as emergent literacy, is based on the theoretical perspective that, from birth, young children are exposed to oral and written language when interacting socially and with their environment (Saracho, 2017). Along the way, following a natural and dynamic learning process, children develop skills, knowledge, strategies, and attitudes as they become emergent readers and writers before receiving formal instruction around the age of 6 in the first grade (Boudreau et al., 2022, Charron et al., 2022; Giasson, 2011; Rohde, 2015).

This interactive process, presented in Figure 1, occurs within children's culture and community, and can be influenced by demographics such as socioeconomic status and parents' level of education (Drainville et al., 2020; Rohde, 2015). Although other early literacy models have been presented in previous studies (e.g., Giasson, 2011; Whitehurst & Lonigan, 1998; Sénéchal et al., 2001), Rohde's (2015) theoretical model adds the importance of context when promoting children's early literacy, including elements from their cultural background, demographic variables, and community involvement. Relationships between the three main components of early literacy (oral language, print awareness and phonological awareness) enable the development of more complex sets of skills, such as comprehension strategies, letter-sound relationships, and lexical restructuring (Rohde, 2015). From a comprehensive point of view, it is during social interactions and the exploration of their environment that children develop what are considered low-level skills necessary for decoding and encoding words, such as knowledge pertaining to letter names and sounds, as well as high-level skills, such as the acquisition of vocabulary and oral comprehension/production, both types of skills considered essential for learning to read and write in the elementary grades (Almasi & Hart, 2019; Charron et al., 2022).

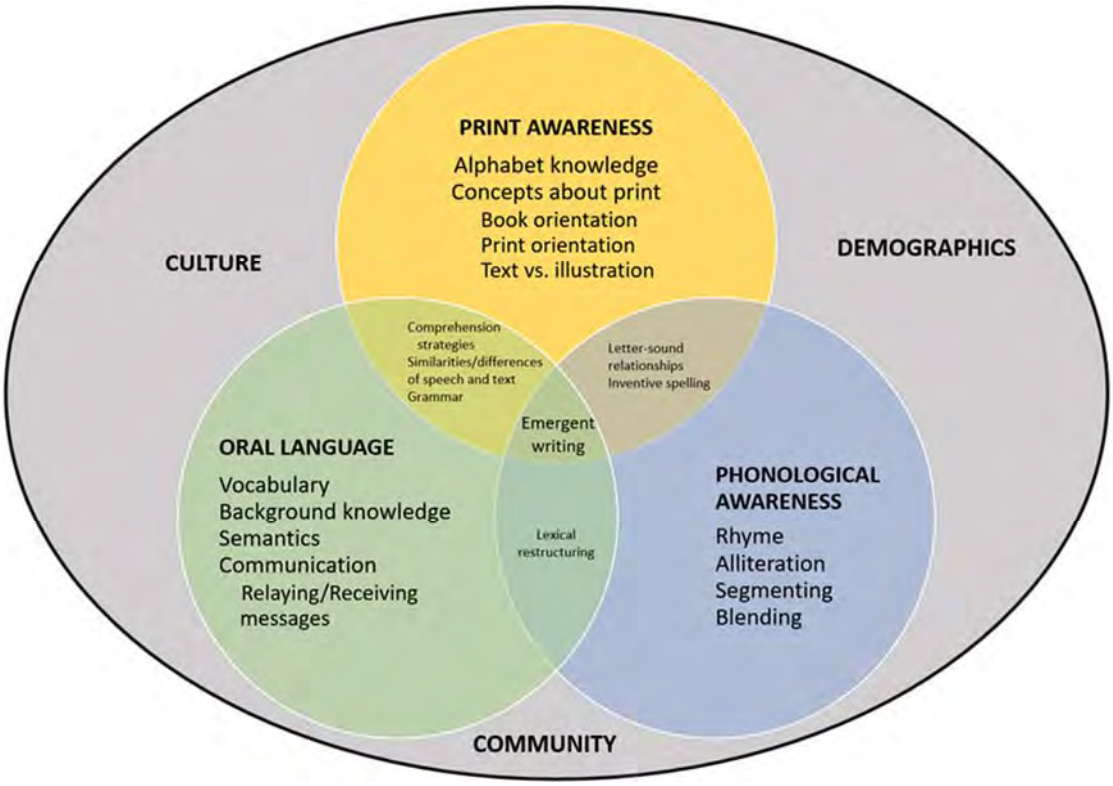

Figure 1. Early literacy model (Rohde, 2015; adapted from Drainville et al., 2020)

1.4 Literacy Environment in Early Childhood Classrooms

As mentioned, the literacy environment includes a physical dimension, i.e., the layout of learning centres – reading, writing, symbolic play, etc. – and a variety of resources, such as writing materials available, quantity and quality of books, posters, and tablets (Lachapelle et al., 2024). The literacy environment also includes an interactive dimension, which refers to early literacy teaching practices and interactions between teachers and children (Dynia et al., 2018; Guo et al., 2012). Table 1 presents examples of elements that can support the quality of these two dimensions in relation to oral language, print awareness and phonological awareness (Boudreau et al., 2022; Charron et al., 2022; Cunningham, 2010; Dynia et al., 2018; Morrow et al., 2019; Smith et al., 2008; Villeneuve-Lapointe et al., 2023). It should be noted that the presence of both physical and interactive elements is essential to ensure the quality of the literacy environment in early childhood classrooms (Guo et al., 2012).

Table 1. Early literacy components and elements observed pertaining to the physical and the interactive dimensions of the classroom environment

Early literacy components (Rohde, 2015)	Examples of elements from the physical dimension	Examples of elements from the interactive dimension
Oral language	▪ Comfortable and appealing reading area ▪ Gathering space near a writing board for whole-group discussions ▪ Open-ended materials that foster interactions between children	▪ Positive climate that supports extended conversations based on open-ended questions ▪ Interactive reading to develop comprehension strategies ▪ Efforts to build vocabulary
Print awareness	▪ Alphabet placed at children's level ▪ Name labels for identification ▪ Writing center that includes a variety of papers, pencils, and envelopes ▪ Pictograms for daily schedule	▪ Morning message written and read with the group ▪ Interactions around print (e.g., refering to attendance chart) ▪ Teacher dictation (e.g., show children left to right writing) ▪ Invented spelling
Phonological awareness	▪ Listening center with audiobooks, songs, rhymes ▪ Poetry, alphabet books, picture books ▪ Different types of games referring to syllables, rhymes, phonemes	▪ Songs and rhymes as part of transitions and daily activities ▪ Teacher support for children's emergent writing ▪ Read-aloud with focus on syllables, rhymes, and phonemes

Since children's engagement is considered another influencing factor for their development and learning, Kennedy (2013) suggests increasing their level of engagement by considering various elements of the literacy environment, including the physical layout, the choice of resources and materials offered, and the activities and pedagogical approaches put forward. Physical elements of the classroom are not enough on their own to encourage children to explore early literacy and foster their engagement. Teachers also need to support children and encourage them to interact with print and print-related materials in the classroom (Dynia et al., 2018; Guo et al., 2012).

1.5 Engagement and Educational Success

Recognized for its positive influence on children's present and future educational success (Bohlmann et al., 2019; Neuharth-Pritchett & Bub, 2022; Sabol et al., 2018), engagement is characterized by the quality of children's participation and involvement during daily activities, their focused and sustained attention, as well as the duration of developpementaly appropriate interactions with social (teachers, peers) and physical (materials and games) elements of the classroom environment (Lachapelle et al., 2021; McWilliam & Casey, 2008). Thus, positively engaged children demonstrate curiosity, motivation, and perseverance in the activities they undertake while developing close relationships with their teachers and peers (Bouchard et al., 2021; Breton et al., 2021; Sabol et al., 2018).

Attachment and self-determination theories have greatly influenced how children's engagement can be defined and measured. It is through observations of everyday classroom activities that patterns of engagement can emerge from children's interactions with their teachers, peers, and the ability to remain on task (Downer et al., 2010). Teacher interactions refer to the quality of the emotional connection between children and teachers, but also to their mutual enjoyment of one another and communication initiatives. Peer interactions are characterized by positive emotions, conversations, and positive strategies during social exchanges. Task orientation refers to the child being centered on learning activities, and showing self-reliance in the classroom (Downer et al., 2010). Aggressive and antisocial behaviors, defiance and negative emotional manifestations are categorized as conflict interactions (Bohlmann et al., 2019).

1.6 Study Objectives

As the quality of the literacy environment appears to support children's level of engagement in the classroom, namely in learning opportunities related to oral language, reading, and writing, it is important to better understand if a high-quality environment fosters higher levels of engagement, which few studies have done using validated observational tools (Aydoğan et al., 2015).

The present study pursues three specific aims:

1) Assess the quality of the literacy environment in early childhood classrooms.

2) Assess children's level of engagement in these classrooms.

3) Examine associations between the quality of the literacy environment and children's level of engagement.

2. Method

This study is part of a larger research project conducted through a literacy research program funded by Fonds de recherche du Québec – Société et culture (Charron et al., 2021–2024). A descriptive correlational design was developed to explore and describe potential associations between the study variables (Duval et al., 2021).

2.1 Participants

Participants were recruited from 8 school boards in the Montreal area (Québec, Canada). A total of 23 kindergarten teachers and 7 preschool teachers participated in the project. The average age of the teachers was 43.13 years (SD = 6.85), and they had an average of 17.20 years of teaching experience (SD = 6.38), including 13.30 years of teaching experience in kindergarten or preschool (SD = 6.50). In addition, 150 children (n = 75 girls) were randomly recruited from these classrooms to participate in this study. The mean age of the children was 69.72 months (SD = 6.44). On average, the schools' socio-economic status (SES) score, composed of two variables (mother's education and parents' unemployment), was 6.90 (SD = 2.58), an SES score of 1 representing more advantaged schools, and a score of 10 representing highly disadvantaged schools. In the participating classes, the average number of children in the group was 15.93 (SD = 2.46), based on an average of 14.43 children in preschool (SD = 2.37) and 16.39 children in kindergarten (SD = 2.35). Sociodemographic data were obtained from the teachers using an online questionnaire.

2.2 Measures and Data Collection

Data was collected from February 2022 to June 2022. The quality of the literacy environment in the 30 participating classrooms was assessed using the *Early Language and Literacy Classroom Observation Pre-K* (ELLCO Pre-K; Smith et al., 2008). This observational tool has been validated in numerous studies (Egert et al., 2018) and includes items from the interactive and the physical dimensions of the literacy environment. The ELLCO Pre-K is also coherent with Rohde's early literacy model as it includes items relating to oral language, reading, and writing practices, while being sensitive to contextual elements such as cultural diversity in the classroom.

A trained observer was present in the classroom during a morning classroom visit lasting between 2.5 and 3 hours. Inter-rater agreement was obtained for 20% of the observations, indicating a 98.3% agreement rate within one point on the observation scale.

The ELLCO Pre-K (Smith et al., 2008) comprises 19 items (see Table 2) rated on a 5-point Likert-type scale (1 = "deficient"; 2 = "inadequate"; 3 = "sufficient"; 4 = "adequate" and 5 = "exemplary"). These items are divided into five domains: a) classroom structure (4 items), b) curriculum (3 items), c) language environment (4 items), d) books and book reading (5 items) and e) print and early writing (3 items). These domains are grouped into two subscales: a) general classroom environment ($\alpha = 0.90$), which includes the first two domains, and b) language and literacy ($\alpha = 0.86$), which includes the last three domains (Smith et al., 2008).

Table 2. Structure of the ELLCO Pre-K

General Classroom Environment
Section I. Classroom Structure
Item 1. Organization of the Classroom
Item 2. Contents of the Classroom
Item 3. Classroom Management
Item 4. Personnel
Section II. Curriculum
Item 5. Approaches to Curriculum
Item 6. Opportunities for Child Choice and Initiatives
Item 7. Recognizing Diversity in the Classroom
Language and Literacy
Section III. Language Environment
Item 8. Discourse Climate
Item 9. Opportunities for Extended Conversations
Item 10. Efforts to Build Vocabulary
Item 11. Phonological Awareness
Section IV. Books and Book Reading
Item 12. Organization of Book Area
Item 13. Characteristics of Books
Item 14. Books for Learning
Item 15. Approaches to Book Reading
Item 16. Quality of Book Reading
Section V. Print and Early Writing
Item 17. Early Writing Environment
Item 18. Support for Children's Writing
Item 19. Environmental Print

Secondly, children's level of engagement was assessed using the *Individualized Classroom Assessment Scoring System* (inCLASS; Downer et al., 2010). Scores given on a Likert scale (1–2 = low; 3–5 = medium; 6–7 = high) were assigned to each domain, namely teacher interactions, peer interactions, task orientation and conflict interactions. To observe a total of 5 children per classroom during one morning session, over a period ranging from 2.5 to 3 hours, two certified observers focused on one child at a time. Inter-rater agreement was reported for 20% of the observations. The agreement rate for all domains was 92.5% within one point on the observation scale. The inCLASS (Downer et al., 2010) is a tool with good internal consistency ($\alpha = 0.72$), validated following observations in 104 preschool classrooms with 381 children in the United States. The inCLASS has also been used in several studies in the Unites States, Canada, and Europe (Lindström et al., 2021). Table 3 presents the four domains of engagement and their respective dimensions. Examples of indicators of child behaviors in terms of their engagement in the classroom are also included for each dimension.

Table 3. Domains and dimensions of child engagement (Bohlmann et al., 2019; Downer et al., 2010)

Domains	Dimensions	Indicators of child behaviors
Teacher interactions	Positive engagement	Emotional attachment to the teacher, seeking out and showing enjoyment during interactions, using the teacher as a secure base
	Teacher communication	Initiating and sustaining communication with the teacher for social and practical purposes
Peer interactions	Peer sociability	Seeking out peers and sharing positive emotions while interacting with them
	Peer communication	Initiating and sustaining communication with peers for social and practical purposes
	Peer assertiveness	Initiating and maintaining peer interactions and expressing leadership by using positive and successful strategies
Task orientation	Task engagement	Intensity, duration, and enthusiasm shown towards activities and tasks, including sustained attention
	Self-reliance	Independence and sense of initiative in the learning process, and the use of classroom resources
Conflict interactions	Teacher conflict	Demonstrating tension, aggression, or negativity towards the teacher
	Peer conflict	Demonstrating tension, aggression, or negativity towards peers
	Behavior control (reversely coded)	Matching expectations according to settings, regulating verbal or physical behavior

2.3 Data Analysis

Descriptive analyses (mean, standard deviation, range) were carried out to assess the quality of the literacy environment with regards to the five domains (classroom structure, curriculum, language environment, books and book reading, print and early writing) assessed by the ELLCO Pre-K. In the case of the second objective, which was to assess children's level of engagement, the same descriptive analyses were also carried out for the four domains (teacher interactions, peer interactions, task orientation and conflict interactions) assessed by the inCLASS (Downer et al., 2010).

Regarding the third objective of this study, which was to examine associations between the quality of the literacy environment and children's level of engagement, multilevel regression analyses were carried out. These analyses are generally recommended for studies conducted in educational contexts characterized by a hierarchical system of several levels composed of individuals (level 1: child-level variables) nested within groups (level 2: teacher-level variables) (Seltzer & Rickles, 2021). Children's age and gender were used as level 1 control variables in the regression models. Also, teachers' years of experience (overall and in early childhood education) and the number of children per group were added to the regression models as level 2 variables. The significance threshold for the tests conducted was set at $p \leq .05$.

2.4 Ethical Considerations

This study was approved by the ethics committee of the main researcher's university. Before giving their consent, the children's teachers and parents (or legal guardians) were informed of the aims of the study, the elements of consent, including confidential data management, and the possibility of withdrawing from the study at any time.

3. Results

3.1 Descriptive Statistics for the Literacy Environment

Table 4 presents descriptive statistics of the ELLCO Pre-K for each of the two subscales (general classroom environment; language and literacy) and for the five domains (classroom structure; curriculum; language environment; books and book reading; print and early writing). Average scores are then interpreted according to the quality indicators proposed by Smith et al. (2008), which suggest different levels of quality depending on the scores obtained (0 to 2.50 = low; 2.51 to 3.50 = basic; 3.51 to 5.00 = high).

Table 4. Average scores for the ELLCO Pre-K (score range 1–5)

	M	SD	Minimum	Maximum
General classroom environment	**3.28**	**0.71**	**2.09**	**4.84**
I. Classroom structure	3.65	0.72	2.33	5.00
II. Curriculum#	2.91	0.86	1.67	4.67
Language and literacy	**3.23**	**0.69**	**2.19**	**4.87**
III. Language environment#	3.38	0.73	2.25	5.00
IV. Books and book reading#	3.37	0.72	2.20	4.80
V. Print and early writing#	2.90	0.87	1.33	5.00
Total average score	**3.24**	**0.65**	**2.18**	**4.83**

Note. N = 30 (except for item 4 for which N = 11). M = mean, SD = standard deviation.

These results indicate that the quality level of the literacy environment is generally considered basic, with a mean total score of 3.24 (SD = 0.65), including the general classroom environment subscale (M = 3.28; SD = 0.71) and the language and literacy subscale (M = 3.23; SD = 0.69). Furthermore, only the classroom structure reaches high quality (M = 3.65; SD = 0.72), while curriculum, language environment, books and book reading, as well as print and early writing, remain at a basic quality level.

3.2 Descriptive Statistics for Children's Engagement

Regarding children's levels of engagement, Table 5 shows descriptive statistics of the inCLASS for all four domains and their respective dimensions.

Table 5. Average scores for the inCLASS (score range 1–7)

inCLASS scores	M	SD	Minimum	Maximum
Teacher interactions	**2.43**	**0.63**	**1.00**	**4.38**
Positive engagement	2.94	0.81	1.00	5.25
Communication	1.91	0.65	1.00	4.25
Peer interactions	**2.82**	**0.73**	**1.25**	**4.58**
Sociability	3.60	0.86	1.75	5.75
Communication	2.56	0.77	1.00	4.25
Assertiveness	2.30	0.76	1.00	4.50
Task orientation	**4.49**	**0.68**	**2.63**	**6.25**
Engagement	5.19	0.76	3.25	7.00
Self-reliance	3.79	0.82	1.75	6.50
Conflict interactions	**1.32**	**0.35**	**1.00**	**2.83**
Teacher conflict	1.09	0.21	1.00	2.25
Peer conflict	1.25	0.34	1.00	2.75
Behavior control*	1.64	0.73	1.00	5.00

Note. N = 150 (75 girls). M = mean, SD = standard deviation; *Reversely scored.

Considering these results, teacher interactions (M = 2.43; SD = 0.63) and peer interactions (M = 2.82; SD = 0.73) are at low to medium quality levels. Task orientation was assessed in the medium range (M = 4.49; SD = 0.68), while conflict interactions remained low (M = 1.32; SD = 0.35).

Following correlation analyses between the different variables under study, a VIF (Variance Inflation Factor) index greater than 3 suggested the presence of multicollinearity between two variables, curriculum and books and book reading. Since books and reading activities in the classroom are frequently linked to themes studied in the current curriculum (Shedd & Duke, 2008), these two variables were averaged to create a new variable (curriculum/books and book reading), which remained at a basic quality level (M = 3.14; SD = 0.77).

3.3 Multilevel Regression Models

Regarding associations between the quality of the literacy educational environment and children's engagement, multilevel regression models are presented to show which literacy environment variables and control variables (e.g., teacher experience, SES index, number of children in group, child age) can be associated with children's engagement (see Table 6).

Table 6. Multilevel regression models

	Teacher Interactions		Peer Interactions		Task Orientation		Conflict Interactions	
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
(Y-Intercept)	2.01(.90)*	-.05	2.11(.92)*	.08*	3.11(.82)***	.02	1.38(.54)*	.08
ELLCO Pre-K Domains								
Classroom Structure	.10(.15)	.11	-.02(.15)	-.02	.05(.13)	.05	-.04(.09)	-.08
Curriculum/Books and Book Reading	.28(.17)	.33	-.22(.17)	-.23	.15(.15)	.17	-.04(.10)	-.09
Language Environment	-.19(.14)	-.22	.04(.14)	.03	.09(.12)	.09	-.11(.08)	-.22
Print and Early Writing	-.00(.14)	-.01	-.09(.14)	-.11	-.14(.12)	-.18	.12(.08)	.29
Control Variables								
Teaching experience (years)	.03(.02)	.30	.02(.02)	.17	.01(.02)	.11	-.02(.22)	-.02
Pre-K / K Teaching experience (years)	-.02(.02)	-.23	-.02(.02)	-.16	-.02(.02)	-.17	-.10(.22)	-.10
Group size	-.06(.04)	-.21	.07(.04)*	.24	-.06(.03)	-.21	.32(.15)*	.32
Child gender	.06(.10)	.10	-.11(.12)	-.15	-.03(.11)	-.05	-.17(.15)	-.17
Socioeconomic status (SES)	.02(.01)*	.42	-.00(.02)	-.05	.00(.01)	0.01	.12(.22)	.12
Child age (months)	.00(.01)	.02	.01(.01)	.06	.02(.01)*	.23	-.06(.11)	-.06(.11)
Random effects								
σ2	0.34		0.49		0.45		0.09	
τ00 Code_class	0.06		0.03		0.01		0.03	
.131/.267	.116/.171							

*p < .05. **p < .01. ***p < .001.

Results suggest that literacy environment variables (classroom structure, curriculum/books and book reading, language environment, print and early writing) are not predictive of children's engagement regarding teacher interactions, peer interactions, task orientation and conflict interactions. However, in the case of control variables, the SES index was found to be significantly associated with teacher interactions ($\beta = .02$, $p < .05$), indicating higher levels of engagement for children in more disadvantaged classrooms. Also, the number of children per group was significantly associated with peer interactions ($\beta = .07$, $p < .05$) and conflict interactions ($\beta = .32$, $p < .05$), suggesting that a larger number of children in the group might be conducive to more potential play partners for children, while at the same time producing more possibilities for conflictual situations. Also, children's age was significantly associated with task orientation ($\beta = .02$, $p < .05$), suggesting that their engagement might reach higher levels as they get older and are better able to concentrate during daily classroom activities.

4. Discussion

As shown in other recent work (e.g., Arteaga et al., 2019; Charron et al., 2022), results of the present study reveal a basic level of quality of the literacy environment as assessed by the ELLCO Pre-K in the 30 classrooms observed. Generally, teachers organize materials and play activities effectively in the classroom, manage the group of children appropriately, occasionally incorporate a theme to make learning more meaningful, and sometimes enable children to make choices and take initiatives. However, little attention is paid to cultural diversity in classroom activities and materials. It would be beneficial for teachers to offer children more regular activities that consider their interests and life experiences (Armand et al., 2021), while supporting their autonomy. This would encourage children's engagement from the very start of preschool education, which would also have a positive impact on their later educational success (Hofkens & Pianta, 2022).

On the other hand, teachers occasionally offer support for oral language development and promote books for pleasure and for learning, sometimes set up an attractive reading area, but rarely integrate writing activities in the classroom daily routines. Consistent with other studies, these findings suggest that teachers do not take every opportunity during classroom daily activities to support early literacy within meaningful learning contexts (Charron et al., 2022; Guo et al., 2012).

These findings could be explained by a lack of knowledge among teachers regarding research-based early literacy practices, and insufficient training that does not enable them to put such knowledge into practice (Charron et al., 2022; Lehrer et al., 2017). Accompanying teachers is therefore a keyway to support them in developing quality practices regarding early literacy (Elek et al., 2022). Professional development can include training to sustain teachers' knowledge of practices that support early literacy, individualized support to achieve professional goals determined jointly with the teachers, and guided reflective feedback on their practices (Elek et al., 2022).

Like other studies that have assessed children's engagement using the inCLASS (Kim et al., 2019; Roy-Vallières et al., 2022; Slot & Bleses, 2018; Williford et al., 2013), findings reveal a low to medium level of overall engagement. Teacher interactions ($M = 2.43$; $SD = 0.63$) are at a low level. These results reflect rare moments of affective attunement with the teacher, of seeking closeness or sharing positive affects. Likewise, it is uncommon for children to initiate and maintain conversations with the teacher to sustain a variety of communicative intentions.

According to Aström et al. (2022), teachers often find themselves at a distance from the children during the day, for example during free play. Depending on their values and conceptions of child development, teachers may consider that their support is not required to help children develop mature play, and instead take advantage of free play periods to attend to other tasks (Landry & Lemay, 2022). As a result, opportunities to observe interactions between targeted children and their teacher during an observation cycle are likely to be rare.

As in the case of improving the quality of the literacy environment, teacher training appears essential to establish quality interactions between children and their teachers (Breton et al., 2022; Partee et al., 2022). For example, teachers could be coached to provide scaffolding by taking on different roles as mediators and play partners during free play (Landry & Lemay, 2022), which would foster greater engagement of children in their own learning (Lachapelle et al., 2021).

Peer interactions were rated medium-low ($M = 2.82$; $SD = 0.73$). Children occasionally show a desire to be in the presence of their peers, to communicate, to share positive affects and to cooperate with them, while occasionally demonstrating positive interpersonal initiatives and leadership (Downer et al., 2010). Again, these results are similar to what has been reported in other studies (Kim et al., 2019; Lachapelle et al., 2023; Ramirez & Lindberg, 2022; Sabol et al., 2018). One possible explanation could be that teachers often lead activities themselves, offering fewer opportunities for children to interact with each other (Breton et al., 2021; Smidt & Embacher, 2020). Conversely, children seem to interact more frequently with their peers when they initiate and lead play activities themselves (Smidt & Embacher, 2020).

As social skills development represents a greater challenge for children, daily activities should involve peer interactions, both during teacher-led activities and free play. For example, children could be placed in dyads during circle time while being encouraged to express themselves through open-ended questions (Charron et al., 2022) or benefit from the teacher's modeling of various ways of interacting and resolving conflicts (Coutu & Royer, 2022).

As for task orientation, including engagement and self-reliance during learning activities, results show that children demonstrate a medium level of engagement (M = 4.49 SD = 0.68). Children are therefore, at times, actively involved in the daily learning activities, attentive, enthusiastic, independent, and persevering (Downer et al., 2010), while at other times they are not. For example, some individual worksheet tasks may be designed to assess children rather than expose them to meaningful learning (Lachapelle, 2020).

Consistent with other research that has presented medium-range scores for task orientation (Bohlmann et al., 2019; Bulotsky-Shearer et al., 2022; Kim et al., 2019; Lachapelle et al., 2023; Sabol et al., 2018; Slot & Bleses, 2018; Williford et al., 2013; Yang et al., 2022), these findings suggest that it may be easier for children to be committed to tasks or activities than to the people around them (Roy-Vallières et al., 2022). Interacting with teachers and peers requires language and social skills that might not be fully developed in 4- and 5-year-old children (McWilliam & Casey, 2008).

According to findings by Vitiello and Williford (2020), task orientation varies greatly over the course of a day in the classroom. Moreover, the very presence of teachers, whether they are leading the activity or not, has been found to negatively influence task orientation. Thus, in general, certain learning contexts, notably activities where the teacher is more involved, large-group activities, routines, and transitions, are associated with a lower level of task orientation, whereas free play remains a context where task orientation is higher overall (Vitiello & Williford, 2020).

As shown in other studies on children's engagement (Bulotsky-Shearer et al., 2022; Kim et al., 2019; Partee et al., 2022; Roy-Vallières et al., 2022; Smidt & Embacher, 2020; Williford et al., 2013; Yang et al., 2022), the low level of conflict interactions indicates that children rarely engage in aggressive, oppositional or non-obedient behaviors, display little negative affect, seek little attention, are generally patient and meet teachers' expectations (Downer et al., 2010). Furthermore, findings from observation of the literacy environment, particularly regarding classroom management, suggest that teachers generally establish rules and routines that support children's behaviors.

The quality of the literacy environment was not found to be associated with children's engagement, even though previous work suggests that teachers play an important role in fostering children's engagement, particularly in learning contexts that support early literacy (Dynia et al., 2018; Guo et al., 2012). In the case of the present study, these findings could be explained by the relatively small sample size, which would prevent the detection of significant associations between the quality of the literacy environment and children's engagement. In addition, the inCLASS appears to be sensitive to the learning contexts observed in the classroom (Carbonneau et al., 2020). For example, a child who listens attentively to the teacher during storytelling will not necessarily be engaged with his or her peers during this activity.

Children's socioeconomic background appears to exert an influence on the quality of their engagement with their teachers, which suggests that a child's individual context and culture exerts a certain influence on their learning experiences, including those pertaining to early literacy (Rohde, 2015). Findings also show that the number of children in the group was associated with peer and conflict interactions. Perhaps a greater number of peers in the group offers more opportunities for quality interactions, while at the same time increasing the possibility of experiencing certain conflicts (Ramirez & Linberg, 2022). In larger groups, teachers may be solicited by more children at the same time and may not be able to intervene quickly in conflictual situations.

5. Conclusions

This article added to existing knowledge by providing rigorous assessments of literacy environments in 30 early childhood classrooms in Québec (Canada) and evaluating 150 children's engagement. Findings highlighted the basic quality of the literacy environment in Quebec early childhood education classrooms, and a low to medium level of child engagement. These results underline the importance of supporting teachers in their pre-service and inservice training to set up a physical environment and use educational practices that promote early literacy among 4- and 5-year-olds, as well as their engagement towards their teachers, peers, and classroom activities. This research would benefit from being replicated with a larger and more diverse sample to better detect any potential associations between the quality level of the literacy environment and children's engagement. In addition, it would be relevant to study how specific child characteristics, such as the presence or absence of disruptive behaviours, could explain levels of engagement in the classroom. As such, a greater number of observations would certainly better represent the variability of children's individual experiences. In order to observe a larger number of children

within a variety of classroom learning contexts, video recordings could be considered. Furthermore, from a longitudinal perspective, it would be of interest to examine whether children's age constitutes a moderating variable that would better explain the impact of the quality of the literacy environment on the evolution of children's levels of engagement (McWilliam & Casey, 2008). Finally, action research (Charron, 2021) could be undertaken to offer coaching to preschool and kindergarten teachers, which could fill certain gaps in their training and increase the quality of early literacy practices and their support for children's engagement.

This study has certain limitations. Firstly, the sample size may be too small to achieve sufficient statistical power for multilevel regression analyses. Also, only one observation per class was conducted with the ELLCO Pre-K, which may not allow to observe the full range of educational practices implemented by teachers over several days. Furthermore, although four cycles of observations were carried out using the inCLASS with each child, it is possible that a greater number of observations would better represent the variability of children's individual experiences. Finally, a low response rate (67%) to the sociodemographic questionnaire sent to parents meant that data relating to home language, family income and parental education could not be used. Future research should consider sending personalized printed questionnaires to parents.

Despite certain limitations inherent in this study, including sample size and representativeness, it is important to emphasize the contribution of this research to scientific and practical knowledge. First and foremost, classroom observations rigorously documented the quality of the literacy environment. The presence of preschool and kindergarten classrooms in the sample provides a better representation of the current reality of educational contexts in Québec that include these two types of early childhood education classrooms within schools. Moreover, a focus on children's engagement in their own development and learning will also sustain educational practices that further support this important factor in their present and future educational success.

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Authors' contributions

J. Lachapelle and A. Charron were responsible for study design, revising, and data collection. J. Lachapelle drafted the manuscript; A. Charron and N. Bigras revised it. All authors read and approved the final manuscript.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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No additional data are available.

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