USING ENVIRONMENTAL PRINT TO SUPPORT PRESCHOOLERS' LOGOGRAPHIC READING SKILLS AND BASIC CONCEPT KNOWLEDGE

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ABSTRACT

USING ENVIRONMENTAL PRINT TO SUPPORT PRESCHOOLERS' LOGOGRAPHIC READING SKILLS AND BASIC CONCEPT KNOWLEDGE

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This study aimed to investigate 48- to 54-month-old children's logographic reading and receptive, expressive skills on basic colors and shapes through environmental print activities. In this study, which was conducted as an explanatory case study within the framework of this purpose, 18 children, nine boys, and nine girls, equally distributed according to gender, their mothers, and the classroom teacher participated. Data collection tools included a demographic information form, the frequency of interaction between environmental print and child form, logographic reading tests, observations, semi-structured interviews with mothers and teacher, and checklists. A comparison of logographic reading pre-post-test results revealed notable improvements in children's logographic reading skills at all levels. Accordingly, children showed higher proficiency in recognizing environmental prints at the simpler levels, whereas this proficiency decreased remarkably at the more complex levels. In addition, considerable progress was observed in children's receptive and expressive skills on colors and shapes. The most striking improvement was observed in expressive skills related to the concept of shape, followed by

receptive skills. Girls consistently outperformed boys' language skills and progressed more in logographic reading proficiency. Logographic reading pre-post test results showed that girls outperformed boys at all levels, especially at the more challenging levels (3, 4, and 5) and that there was a stronger proficiency in logographic reading among girls.

Keywords: Environmental Print, Logographic Reading, Preschool, Basic concept knowledge, Early childhood education

ÖZ

OKUL ÖNCESİ DÖNEM ÇOCUKLARININ LOGOGRAFİK OKUMA BECERİLERİNİ VE TEMEL KAVRAM BİLGİLERİNİ DESTEKLEMEK İÇİN ÇEVRESEL UYARANLARI KULLANMA

KETENCİ, Olcay
Doktora, Temel Eğitim, Okul Öncesi Eğitimi Bölümü
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Bu çalışmanın amacı, çevresel uyaranları içeren etkinlikler vasıtasıyla, 48- 54 aylık çocukların logografik okuma ve temel renk ve şekil becerilerine yönelik alıcı ve ifade edici dil becerilerini araştırmaktır. Bu amaç çerçevesinde, açıklayıcı vaka çalışması olarak yürütülen bu çalışmada, etkinliklerine katılan ve cinsiyete göre eşit dağılım gösteren 9 erkek ve 9 kız, toplam18 çocuk, anneleri ve sınıf öğretmeni katılmıştır. Çalışmada veri toplama aracı olarak demografik bilgi formu, çevresel uyaran-çocuk etkileşim sıklığı bilgi formu, logografik okuma testleri, gözlemler ve hem anneler hem de öğretmenle yapılan yarı yapılandırılmış görüşmeler ve kontrol listeleri yer almaktadır. Logografik okuma ön ve son test sonuçlarının karşılaştırılmasına göre, tüm seviyelerde çocukların logografik okuma seviyelerinde kayda değer gelişmeler olduğunu ortaya çıkmıştır. Buna göre, çocukların, daha basit seviyelerde çevresel uyaranları tanıma konusunda daha yüksek yeterlilik gösterdikleri, daha karmaşık seviyelerde bu yeterliliğin önemli ölçüde azaldığı görülmektedir. Ayrıca, çocukların renkler ve şekillerle ilgili alıcı ve ifade edici dil becerilerinde kayda değer bir ilerleme gözlemlenmiştir. En kayda değer gelişme şekil

kavramıyla ilgili ifade edici dil becerilerinde gözlenmiş, bunu alıcı dil becerileri izlemiştir. Dil becerileri bakımından kızların sürekli olarak erkeklerden daha iyi performans gösterdiği ve logografik okuma yeterliliği konusunda da daha fazla ilerleme kaydettikleri ortaya çıkmıştır. Logografik okuma ön-son test sonuçları, kızların tüm seviyelerde, özellikle de daha zorlu seviyelerde (3, 4 ve 5) erkeklerden daha başarılı olduğunu ve kızlar arasında logografik okumada daha güçlü bir yeterlilik sergiledikleri görülmüştür.

Anahtar Kelimeler: Çevresel Uyaranlar, Logografik Okuma, Anaokulu, Temel Kavram Bilgisi, Okul Öncesi Eğitim

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I dedicate this study to both of you, with all my love.

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LIST OF ABBREVIATIONS

EP	Environmental Print
NELP	National Early Literacy Panel
NECP	National Early Childhood Program
NCES	National Center for Education Statistics
NAEYC	National Association of the Education of Young Children
ZPD	Zone of Proximal Development
CAP	Concepts about Print
CELF	Clinical Evaluation of Language Fundamentals
NRDLS	New Reynell Development Language Skills
TERA	Test of Early Reading Ability
SES	Socioeconomic Status
MoNE	Ministry of National Education

CHAPTER 1

INTRODUCTION

This chapter introduces the problem statement, presents the purpose and significance of the study, and articulates the research questions that guide this investigation. The research's conceptual framework is also established, and key terms essential for a comprehensive understanding of the research context are defined.

1.1. Introduction

In early childhood, literacy development is a foundational aspect of language acquisition, as it involves the recognition and understanding of reading and writing before formal instruction begins. Children develop early literacy awareness through interactions with both oral and written language, which serves as a precursor to conventional literacy skills (Whitehurst and Lonigan, 1998). During these formative years, the ability to grasp basic literacy concepts plays a critical role in shaping their future academic success (National Early Literacy Panel, 2008). However, many children enter formal education without these essential emergent literacy skills, which notably hinders their progress and places them at a disadvantage compared to peers who have had greater exposure (Chatterji, 2006). This disparity in emergent literacy skills is not only observed at an individual level but is also reflected in broader educational assessments, highlighting the ongoing challenges faced by students in various countries, including Türkiye. Findings from international comparative studies, such as the Program for International Student Assessment (PISA), conducted in 2018 and 2022, reveal that Turkish students' reading performance scores have consistently fallen below the global average. Furthermore, acquiring reading and writing skills poses a significant challenge for most children due to its inherent cognitive complexity (Adams, 1990). According to the National

Center for Education Statistics (2001), a substantial 37% of primary-grade students worldwide do not attain the expected level of reading proficiency (Torgesen, 2002). Likewise, many investigations have highlighted the difficulty many first-grade students face in Türkiye learning to read (Kocaarslan, 2013; Ergül, 2012; and Yurdakal, 2014).

According to the National Early Childhood Education Program (2024), emergent literacy is a crucial field, and its primary aim is not to directly teach reading and writing but rather to cultivate emergent literacy skills, ensuring a smooth transition to the first-grade level. Despite these educational policies, limited investigations have been conducted regarding early literacy skills, emergent literacy knowledge, and reading issues in the national context (Kartal and Özteke, 2010; Altıparmak, 2010).

Acknowledging the intricate cognitive process involved in learning to read, it is evident that a substantial number of children confront challenges during their early years, resulting in postponed initiation of emergent literacy instruction and subsequent impediments in acquiring proficient reading skills (Adam, 1990). Longitudinal case study results suggest that Developmentally Appropriate Practices (DAP) play a crucial role in enhancing emergent literacy knowledge during early childhood, serving as an intervention technique to identify children at risk before formal reading instruction (Young, 2009; Justice, Kaderavek, Fan, Sofka and Hunt, 2009).

A consensus among researchers suggests that a robust understanding of emergent literacy serves as a pivotal predictor for children's future success in reading and writing, particularly during the initial years of primary school (NELP, 2008; Spira, Bracken, Fischel, 2005; Shanahan, Lonigan, 2013). Moreover, professional organizations like the National Association of the Education of Young Children (NAEYC) (2009) claim that emergent literacy knowledge is a vital precursor to learning formal reading and writing. It is also essential for future academic success and prevents possible reading difficulties. Hence, although the ability to read and write develops throughout a person's lifespan, between birth and the age of eight is the most crucial period for children's literacy development (Saracho, 2017).

Consequently, numerous investigations have been undertaken to explore the acquisition of emergent literacy knowledge during early childhood (Bayetto, 2013; Strickland, 2011; Neumann, Hood, and Ford, 2013; NELP, 2008; NCFL, 2009; Pinto, Bigozzi, Vezzani, Tarchi, 2016).

However, Snow Burns and Griffin (1998) pointed out three main problems that cause reading difficulty in children's future reading ability. These are the lack of alphabetic principal knowledge, emergent writing, and print awareness. Thus, the National Early Literacy Panel's (2006) meta-analysis revealed that alphabet knowledge and print awareness are the strongest indicators for forecasting children's formal reading achievement. Similarly, this meta-analytic review strongly affirms the existence of consistent and reliable associations between children's access to print materials and behavioral, educational, and psychological outcomes. Meta-analytic procedures specifically applied to effects observed in "*rigorous"* studies indicate that children's access to print materials plays a causative role in positively influencing children's future academic outcomes. This influence is particularly notable in shaping attitudes toward reading, reading behavior, emergent literacy skills, and overall reading performance (Lindsay, 2010).

In addition to providing access to print materials, the national literature emphasizes the importance of considering other factors in supporting emergent literacy development. In a national context, early childhood educators do not have enough qualifications to support children's emergent literacy development (Coşkun and Deniz, 2017; Ergül et al., 2014) and they complain that there are few literacy materials used to enhance emergent literacy in schools had medium-low SES (Kerem and Cömert, 2005) Alternatively, environmental prints can be used as literacy materials that are available for all children because they surround children's social environment and stimulate naturally children's interest every day (Neumann and Celano, 2001; Korat, 2005).

The emergent literacy development process encompasses skills, attitudes, and knowledge (Clay, 1966; Sulzby, Teale, and Kamberelis, 1989; Whitehurst and Lonigan, 1998). Researchers in the related field acknowledge that children can

possess substantial formal and informal knowledge about books and prints before entering primary school. This accumulation of knowledge significantly contributes to the development of formal reading skills (Neuman and Dickinson, 2003). Emergent literacy development begins when a baby opens their eyes to the world and continues to evolve throughout early childhood. Young children recognize intricate literacy systems in these formative years by observing conversations and navigating their printed environment, including toy and food logos, road signs, restaurant menus, and billboards (Griffith, Beach, Ruan, Dunn, 2008). Environmental prints encompass a variety of elements, including signs, labels, coupons, symbols, toy and food packages, menus, logos, brochures, and billboards (Prior, Gerard, 2004; Horner, 2005). Environmental print is characterized by its attractiveness, colorfulness, uniqueness, functionality, and memorability, which are different from standard print found in storybooks and newspapers. These prints typically consist of single or multi-word labels and are commonly encountered in streets, billboards, stores, advertisements, and shopping centers (Neuman and Dickinson, 2003).

Prior and Gerard (2004) state, '*Environmental print is one of the first sources of reading material for young children and serves as soil for the roots of literacy'* (p.5). Recognized as crucial in early childhood education, environmental prints contribute to the natural sensory experiences of young children, helping them understand language structure and function (Kuby, Aldridge, and Snyder, 1994). Thus, with the assistance of environmental print, they can focus on graphic, social, contextual, and grammatical cues (Harste, Burke, and Woodward, 1981).

Neumann, Hood, Ford, and Neumann (2011) introduced a model of the relationship between environmental print and future literacy learning. The process begins with the development of visual skills from birth. Subsequently, children encounter embedded environmental prints in their surroundings, experiencing these sociocultural literacy materials through interactions with parents, teachers, peers, and older siblings. These interactions enhance children's logographic reading skills, enabling informal reading ability (Mason, 1980; Ehri and Roberts, 2006). Logographic reading involves deriving meaning from environmental print visuals, such as colors, pictures, and contextual cues, before acquiring an alphabetic decoding

strategy (Beech, 2005). Furthermore, Mason (1980) explored the impact of logographic reading on reading development, asserting that environmental print simplifies the learning of print decoding systems. This situation leads the child to become a logographic reader, marking the initial stage in developing early literacy knowledge.

In this framework, scaffolding emerges as a crucial component, given that exposure to environmental prints alone does not inherently impart emergent literacy knowledge, such as letter-sound awareness, vocabulary comprehension, and oral language skills (Neumann et al., 2013). Children require appropriate guidance through adult instruction involving parents, teachers, and older siblings to foster emergent literacy knowledge acquisition, a concept aligned with Vygotsky's sociocultural theory (Vygotsky, 1978; Raymond, 2000). As a strategic method, scaffolding involves adults supporting children to enhance their performance through tailored instructions. This instructional strategy is widely employed by parents in home environments and educators in educational settings to boost literacy skills (Vera, 2007). Consequently, scaffolding has become an integral element in the research designs of numerous influential studies on environmental prints (Neumann, Hood, and Neumann, 2009; Kuby and Aldridge, 2004).

The role of environmental print (EP) in supporting emergent literacy development has gained considerable attention in early childhood education. Research indicates that the period between 48 and 54 months is a critical phase for developing language skills, with EP playing a significant role. Neumann et al. (2013) found that children's engagement with EP varied based on their ability to direct attention, suggesting that interaction with EP could enhance their capacity to learn written language. This finding highlights the importance of children's ability to focus on and extract meaning from EP, vital for literacy development during this period. Similarly, Weiss and Hagen (1988) emphasized the significance of early understanding of written language, demonstrating that children develop literacy skills by interpreting and deriving meaning from EP in their environments. Moreover, Bigozzi et al. (2023) highlighted the variability in word-decoding strategies among 5-year-old children, depending on their sociocultural backgrounds. Their findings underscore the

importance of the period before age five for literacy development as children transition from recognizing words visually to employing more sophisticated decoding strategies. Given these insights, focusing on children between 48 and 54 months of age is essential for understanding the effects of EP on language development and for creating effective emergent literacy programs.

The literature consistently underscores the significant impact of EP on receptive language skills (Kumaş, 2021; Neumann et al., 2013; Prior, 2003; Vera, 2011). Receptive language skills, which enable children to comprehend auditory stimuli, typically precede expressive language development and form the foundation for language use (Nelson et al., 2006; Benedict, 1979). Studies examining the role of EP in supporting receptive language skills demonstrate that EP increases children's awareness of written language and fosters their engagement with print (Neumann et al., 2012). However, while much of the research has focused on receptive language skills, the impact of EP on expressive language development remains underexplored. Expressive language skills, which involve articulating thoughts and emotions, often develop later and may delay receptive language abilities (Konrot, 2005). Farver et al. (2007) noted that the presence of written materials in the home and their use by children significantly enhance receptive and expressive language skills. Building on this understanding, the present study aims to investigate the impact of EP activities on receptive and expressive language development, mainly through incorporating color and shape concepts. By examining how EP contributes to both dimensions of language development, this study seeks to expand the existing literature and provide new insights into the role of EP in emergent literacy.

Additionally, research frequently highlights notable differences in emergent literacy skills between boys and girls. For instance, McTigue et al. (2021) found that girls generally have an advantage in language development and emergent literacy skills compared to boys in early childhood. This advantage has been attributed to girls' more extensive vocabulary and better grasp of grammatical structures from a young age. Conversely, boys tend to engage more in physical play, which can delay their emergent literacy development (Millard, 2003). Despite the recognized benefits of EP for emergent literacy (Neumann et al., 2012; Zamal, Mad Sehat, and Shapiee,

2024), limited research has explored how EP activities influence gender differences. Boys and girls may respond differently to EP, leading to variations in its impact on language skills depending on gender. For example, Cronin et al. (1999) found that girls were more successful than boys in recognizing and learning from EP, suggesting that girls may benefit from EP earlier and that these experiences may play a crucial role in developing their logographic reading skills.

In contrast, a study by Ahmad, Al-Zboon, and Dababneh (2018) with preschool children in Jordan revealed that boys were more successful in recognizing public signs than girls. The researchers attributed this difference to cultural factors, noting that boys in Arab societies tend to be more active and spend more time in public spaces. These contrasting findings suggest that the impact of EP on gender differences may vary depending on cultural context, highlighting the need for further research in this area.

1.2. The Significance of the Study

This study carries significant implications for early childhood education in Türkiye, driven by several key factors. First, the current study introduces the concept of environmental print to the Turkish early childhood education context, providing a fresh perspective on emergent literacy knowledge, especially for children with low-medium SES. Research by Neumann, Hood, and Neumann (2009) emphasizes that EP exposure is critical in developing emergent literacy skills. The study recognizes the limited exploration of environmental print awareness in Turkish-speaking children, highlighting a significant gap in the existing literature. By bridging this gap, the research aims to contribute to theoretical advancements and practical insights into enhancing emergent literacy knowledge among children in Türkiye. The research design is motivated by the understanding that emergent literacy investigations can benefit from a broader cultural perspective. As Snow (2017) suggested, exploring these concepts in languages other than English and different cultural contexts provides a nuanced understanding of how environmental prints impact children's emergent literacy skills. This study seeks to unravel the dynamics of environmental print's role in shaping changes in children's emergent literacy

knowledge through a multi-perspective approach, incorporating the viewpoints of children, mothers, and teachers. The focus extends to areas such as logographic reading and receptive and expressive language and aims to offer theoretical insights and practical implications for Turkish preschools. This comprehensive exploration seeks to fill the existing gaps in the literature and provide a holistic understanding of the processes involved in enhancing emergent literacy in the Turkish context (Allen, Shockley, and Baumann, 1995).

Secondly, the present study endeavors to broaden the scope of earlier inquiries into children's logographic reading and receptive and expressive skills within a national context, utilizing a qualitative approach to examine the impact of exposing them to environmental print. Numerous investigations, including those by Zamal, Mad Sehat, and Shapiee (2024), have highlighted the potential of EP to enhance name recognition and other emergent literacy skills. However, EP interventions have demonstrated success in improving emergent literacy outcomes, and methodological challenges such as the lack of random assignment to control groups persist, as Neuman et al. (2013) noted. None of the studies, encompassing Salewski (1995) and Prior (2003), incorporated random assignment of participants to intervention and control groups. Consequently, the potential impact of pre-existing group disparities on post-intervention variances remains unclear. However, Prior's (2003) investigation provided the most robust evidence of pre-post changes in environmental print reading within intervention groups.

Consequently, a compelling imperative exists for further research that embraces random participant assignment and systematically employs pure environmental print activities (Neuman et al., 2013). Notably, Wepner's investigation (1985) failed to conduct statistical tests on post-intervention differences, introducing uncertainty regarding the statistical significance of the observed distinctions. As mentioned above, the literature exploring the effects of environmental print on emergent literacy skills and subsequent conventional reading skills reveals contradictory results. Therefore, this study seeks to address these gaps by employing rigorous research designs, specifically case studies, to provide a qualitative perspective on the impact of environmental print on children's emergent literacy knowledge and contribute to the related literature.

In the national context, as Altun and Sarı (2018) noted, most literacy studies in this domain have adopted a survey research approach. While survey research serves its purpose of describing population characteristics, attitudes, behaviors, and opinions (Creswell, 2012), it inherently leans towards emphasizing trends rather than presenting solution-oriented interventions. Referring to this potential gap between research and practical application, the current study strategically opts for a case study research design. This approach diverges from the prevalent survey research model. It offers a qualitative lens for a nuanced exploration of the effectiveness of environmental print on emergent literacy knowledge, specifically, logographic reading skills and receptive and expressive language. Drawing inspiration from Yin's (2009) definition of a case study as an investigation of a '*contemporary phenomenon within a real-life context'* (Yin, 2009, p.2.), the research design aims to delve deeply into the intricacies of the impact of environmental print on emergent literacy knowledge. By doing so, it seeks to bridge the divide between theoretical insights and practical applications, providing valuable perspectives for educators and addressing the need for solution-oriented interventions in early childhood education in Türkiye.

Thirdly, this study also scrutinized the receptive and expressive skills components beyond examining logographic reading skills associated with environmental print in the literature. Considering the nature of environmental print, it offers an opportunity to engage children in literacy creatively. It emphasizes that literacy goes beyond reading text; it involves recognizing, assigning meaning to, and creating symbols, colors, and abstract representations in environmental print (Clement, Kent, and Duursma, 2021). Hence, Orellana and Hernandez (1999) offer some recommendations for educators and parents to involve children in creative activities by using environmental print. In the current study, building on the ideas of Orellana and Hernandez (1999), it is proposed that purposefully incorporating environmental print as a teaching tool could serve to engage children and shape and color forms of receptive and expressive language skills. In the current study, an often-overlooked perspective was adopted to examine the colors and shapes present in environmental prints in terms of both receptive and expressive language skills. The research focused on explaining findings related to logographic reading and receptive and expressive

skills, particularly regarding basic concepts knowledge such as colors and shapes. The study also emphasized the children's language knowledge acquisition before and after the implementation, aiming to demonstrate similarities and differences in children's receptive and expressive language outcomes.

Fourthly, this research acknowledges the importance of considering gender as a crucial factor in understanding the nuances of emergent literacy knowledge. Burgin (2009) asserts that numerous factors, such as age, gender, and socioeconomic status, play an essential role in shaping children's engagement with environmental print. These factors are significant as they provide a foundation for future investigations, examining the complex relationships between age, gender, socioeconomic status, and how children interact with and employ environmental print. Many studies (e.g., McTigue et al., 2021; Below et al., 2010; Deasley et al., 2018) consistently find that girls outperform boys in various emergent literacy skills from early childhood to adolescence. Below et al. (2010) showed that girls scored significantly higher than boys in the early stages of emergent literacy development, although these differences tended to diminish by fifth grade. McTigue et al. (2021) further explored this in Norwegian students, finding that girls had an early advantage in emergent literacy skills such as letter recognition and phonemic awareness. However, this advantage decreased over time as boys' skills grew faster with formal instruction. This study highlights the complexity of gender differences in emergent literacy skills. Gender also plays a significant role in children's engagement with emergent literacy activities. Deasley et al. (2018) found that girls were more engaged with traditional storybooks, whereas boys showed more interest in interactive formats, such as alphabet eBooks. This demonstrates that the type of reading material may influence the level of engagement and, consequently, emergent literacy development in boys and girls.

Additionally, cultural context can affect gender disparities in emergent literacy skills. For example, Ahmad et al. (2018) found that Jordanian boys outperformed girls in recognizing public signage due to cultural norms that provided boys with more opportunities to engage with public signage. The environment, including interactions with caregivers, further shapes emergent literacy skills. Phillips (1997) explored the

relationship between self-perception, early reading ability, and gender, finding that girls often had more positive self-perceptions regarding their reading abilities, which could enhance their engagement and success in emergent literacy tasks. Schick and Melzi (2016) emphasized the importance of print-related practices in the homes of Latino preschoolers, noting that girls often received more support from caregivers in emergent literacy-related activities, potentially contributing to the observed gender differences in literacy outcomes.

Moreover, the preschool environment and cognitive abilities appear to differ by gender. Studies reveal that girls may start school with a slight advantage in verbal skills, which gives them a head start in emergent literacy development (Rinaldi et al., 2021; Locke et al., 2002). However, this advantage can be mitigated by effective teaching strategies that support boys' emergent literacy growth (Rinaldi et al., 2021). In conclusion, while previous research has provided valuable insights into gender differences in emergent literacy, the specific role of environmental print in this process remains underexplored. This study aims not only to examine whether environmental print activities influence children's logographic reading skills and receptive and expressive language skills differently based on gender but also to explain the potential reasons behind these differences. The study contributes to the related literature by addressing these aspects, offering new perspectives on the interplay between gender and environmental print in emergent literacy development.

Moreover, environmental prints are an effective literacy tool accessible to children across diverse social backgrounds (Neumann et al., 2012). Notably, children from low and middle socioeconomic backgrounds demonstrate similar proficiency levels in environmental print knowledge (Dickinson and Snow, 1987; Korat, 2005). Nevertheless, the exact role of environmental print in shaping a child's emergent literacy knowledge demands further exploration and discussion. Mere exposure to environmental print may not be satisfactory in fostering emergent literacy in young children (Neumann et al., 2012). By focusing on this aspect, the current research aims to shed light on the impact of environmental print activities on logographic reading and receptive and expressive skills specifically within socioeconomic statuses. This emphasis on SES contributes to the broader goal of promoting

effective literacy interventions that consider the unique needs of children from diverse socioeconomic backgrounds.

This study expands its potential influence on diverse stakeholders. Specifically, it can act as a guiding tool for educators, especially those involved in early childhood education, providing insights into the strategic use of environmental prints to enhance children's emergent literacy development. Moreover, researchers engaged in similar inquiries in this field can integrate the findings of this study into their existing body of literature, fostering to understand. The study also imparts valuable knowledge to parents and caregivers, explaining methods to support children's emergent literacy skills by incorporating common environmental prints. Similarly, professionals in the field of child development can gain valuable insights from this study, revealing opportunities to strengthen language and literacy competencies through careful utilization of children's surroundings. In conclusion, this research has the potential to make a substantial contribution to the comprehension and promotion of emergent literacy knowledge, particularly within the domain of early childhood education.

Based on the issues mentioned earlier, the current study aimed to explain the role of environmental prints on alterations in children's emergent literacy knowledge, specifically within the domains of logographic reading and receptive and expressive skills, facilitated by activities involving environmental prints. Consequently, the current study was carried out to address the following research questions considering the aims mentioned above: The first is to explore 48- to 54-month-old preschoolers' logographic reading and receptive, expressive skills on basic colors and shapes concepts knowledge. The second one is to demonstrate the similarities and differences in children's outcomes before and after implementation.

The following research questions were investigated.

RQ-1. What are the levels of logographic reading and receptive and expressive skills on basic colors and shapes of 48-54-month-old preschool children?

RQ-2. How do the environmental print activities alter 48-to 54-month-old preschoolers' outcomes regarding logographic reading and receptive, expressive skills on basic colors and shapes?

2.1. How do the environmental print activities alter 48-54-month-old preschoolers' logographic reading skills?

2.2. How do the environmental print activities alter 48-54-month-old preschoolers' receptive and expressive skills on basic colors and shapes?

2.3. How do the environmental print activities alter 48-54-month-old preschoolers' logographic reading and receptive, expressive skills on basic colors and shapes in terms of their gender?

1.3. Conceptual Framework

The conceptual framework of the current study draws upon the foundational principles of Piaget's Cognitive Developmental Theory (1962), Vygotsky's Sociocultural Theory (1978), Marie Clay's Emergent Literacy Theory (1991), and Frith's Theory of Reading Acquisition (1985). These theoretical frameworks serve as the guiding pillars for understanding and exploring the research topic, providing a comprehensive lens through which to analyze the dynamics of emergent literacy knowledge. Piaget's constructivist perspective, Vygotsky's emphasis on the role of sociocultural factors, Clay's insights into early literacy acquisition, and Frith's claims about reading acquisition collectively contribute to shaping the theoretical underpinning of this study. By integrating these theories, the research explores the multifaceted aspects of emergent literacy, offering a holistic framework that informs the investigation and interpretation of empirical findings.

Drawing on Piaget's Cognitive Developmental Theory (1962), this study investigates how children actively construct knowledge by interacting with environmental prints. This exploration is Piaget's concepts of assimilation and accommodation, which highlight how children either integrate new cues into their existing schemas or adapt them to incorporate this new information. This research mainly focuses on the sensorimotor and preoperational stages of child development, examining the significant impact of environmental prints on developing logographic reading and

receptive, expressive skills on basic colors and shapes. By exploring how these environmental prints enable the development of schemas, the study aims to shed light on the crucial role of interaction environmental prints in shaping children's emergent literacy outcomes.

In this study, Vygotsky's Sociocultural Theory (1978) is addressed to examine how environmental prints (EP) influence children's emerging literacy knowledge within the Zone of Proximal Development (ZPD). The theory argues that interactions between children and adults enhance the children's learning experiences by providing necessary scaffolding (Vygotsky, 1978). In the context of this research, this theoretical approach aids in exploring how guided interaction with EP can optimize emergent literacy outcomes among children and enhance their abilities to recognize and understand written cues in their environment. Furthermore, this theoretical approach supports the study's objectives to examine children's receptive and expressive skills on primary colors and shapes through EP. Emphasizing the social context of learning and the transformative role of adult guidance, this research aims to provide insights into the effectiveness of EP as a tool in emergent literacy development, highlighting the potential of interactions to bridge the gap between a child's current capabilities and their potential growth.

Marie Clay's Emergent Literacy Theory (1991) serves as the foundational framework for this study by emphasizing the significance of instructional scaffolding in emergent literacy development. The current research investigates how environmental print activities can be optimized to support children's acquisition of logographic reading and receptive, expressive skills on basic color and shape. This approach underpins the study's implementation process, aiming to demonstrate how effective scaffolding enhances children's engagement and learning outcomes in a preschool setting.

Frith's Theory of Reading Acquisition (Frith, 1985). provides a valuable perspective for this study, which aims to enhance the emergent literacy skills of preschool-aged children through environmental print activities. Frith's model outlines the sequential stages of reading development, from logographic recognition to phonological and

orthographic processing (Frith, 1985). In the context of this study, Frith's framework helps to understand how children at the preschool level begin their learning-reading process by recognizing logos and simple shapes, which are critical steps before more complex reading stages.

In brief, the current study aligns with Piaget's theory (1962), emphasizing children's active role in knowledge construction. It also draws on Vygotsky's theory (1978) focus on social interactions, highlighting the importance of guided learning in the zone of proximal development. Additionally, the study connects to Clay's Emergent Literacy Theory (1991) by recognizing the significance of instructional scaffolds in emergent literacy development. Frith's Theory of Reading Acquisition (1985) complements the research, providing a framework for understanding sequential stages in reading growth. These theories contribute to the study's foundation, offering insights into emergent literacy development.

1.4. Definition of Important Terms

Emergent Literacy: Emergent literacy is described as the skills, attitudes, and knowledge that are essential precursors to reading and writing before conventional literacy, and this natural and informal process begins from birth and continues until the age of eight (National Research Council, 2001).

Environmental Print: Environmental print is defined as the non-continuous print that is available in children's natural environment and mainly includes logos, labels, signs, symbols, and billboards (Kirkland, Aldridge, and Kuby, 1991). It has attractive shapes with various letter fonts and real-life functions in their context (Vukelich, Christie, and Enz, 2008; Adams, 1990).

Functional print: Functional print is an environmental print that represents only signs or symbols, etc.; in other words, it does not include any letters (McGee et al., 1988).

Logographic reading: Logographic reading is seen as the first level of reading that is not conventional (Ehri and Wilce, 1985). More specifically, logographic reading

works with the letter's visual cues, which are stored in memory in its' context. However, logographic readers cannot read the manuscript forms of words out of context because of limited knowledge about emergent literacy (Frith, 1985).

Basic Concept Knowledge: Basic concept knowledge refers to a child's ability to comprehend and utilize fundamental concepts such as colors, shapes, sizes, numbers, and spatial relationships. These concepts serve as crucial building blocks for the child's future academic skills and are essential for understanding and engaging with the world in their surroundings (Bracken, 2006).

Receptive Language Skills: Receptive language skills refer to the ability to understand and process spoken language, encompassing the reception of auditory stimuli, which are interpreted through auditory-perceptual processes and neural networks to derive meaning (Nelson et al., 2006). Receptive language skills denote a child's capability to understand the language spoken to them or read (Bracken, 2006).

Expressive Language Skills: Expressive language signifies a child's ability to use language to convey their thoughts, emotions, and ideas (Bracken, 2006). Expressive language skills involve children's language production to articulate thoughts, desires, and emotions into spoken words and coherent sentences using appropriate syntactic and grammatical structures (Konrot, 2005).

Scaffolding: Scaffolding is defined as the strategy or technique that allows children to reach their actual potential with the help of adult assistance (Vygotsky, 1978).

Zone of Proximal Development (ZPD): Conceptualized by Lev Vygotsky (1978), it is central to his sociocultural theory of cognitive development. ZPD delineates the range of tasks that a learner can perform with the guidance of a more knowledgeable other (e.g., a teacher or peer) but cannot complete independently. It signifies the cognitive space between the learner's current level of autonomous performance and their potential level of development when assisted. This concept underscores the critical role of social interaction in learning, wherein cognitive development is facilitated through structured support, commonly referred to as "*scaffolding*".

CHAPTER 2

LITERATURE REVIEW

This chapter presented the concept of emergent literacy, which was initially defined, and its key components were outlined. Following this, the influence of environmental print on emergent literacy skills was examined, with particular emphasis on the importance of sociocultural contexts. The section also explored approaches to measuring logographic reading through environmental print and the impact of receptive and expressive language skills on emergent literacy. Additionally, the effect of gender on emergent literacy skills was discussed, and the common strategies employed in environmental print research were discussed. Finally, the theoretical framework underpinning these investigations was addressed.

2.1. Emergent Literacy: An Overview

This section explains the concept of emergent literacy, explores its various theoretical perspectives, and articulates the components essential to developing children's literacy skills. The discussion begins with exploring emergent literacy's definition and historical development, referencing foundational work by Clay (1991) and Teale and Sulzby (1989). The section then summarizes various theoretical perspectives on emergent literacy as proposed by scholars such as Goodman (1986), McCormick and Mason (1986), and van Kleeck (1998). The essential knowledge and skills children acquire during this stage are detailed, as discussed by Whitehurst and Lonigan (1998) and Storch and Whitehurst (2002) in this part.

2.1.1. The Definition of Emergent Literacy

The definition of literacy development has changed during the last decade, which is parallel to research results (Morrow, and Dougherty, 2011). It was assumed that

maturation is one of the most necessary factors for literacy learning and children are not able to learn literacy skills and knowledge before the first-grade level at the beginning of the 1900s, and it was called the reading readiness approach (Gesell, 1925; Morpell and Washburne, 1931). In contrast to this approach, Teale and Sulzby (1989) proposed no definite beginning and ending point to literacy development. Instead, literacy was seen as a continuous process, and then the concept of emergent literacy emerged in the field of literacy development at the end of the 1900s. That view was called emergent literacy, defined as becoming literate (Clay, 1966). This perspective criticizes the reading readiness approach by claiming no definite magical age at which teachers/parents can open children's heads and pour literacy knowledge inside (Soderman, Gregory, and McCarty, 2005). Instead, the perspective of emergent literacy argues that literacy development begins when the baby opens his/her eyes to the world and continues throughout early childhood. Young children start to recognize complicated systems of literacy using conversations orally and following their printed surroundings involving toy and food logos, road signs, restaurant menus, and billboards as written (Griffith, Beach, Ruan, and Dunn, 2008). Children are exposed to this type of early learning with the help of environmental prints, and emergent literacy skills encompasses what children learn about reading and writing before they are formally recognized as readers and writers. The behaviors through which children exhibit this knowledge are referred to as emergent literacy skills. There is a general agreement that emergent literacy involves the development of knowledge, skills, and attitudes related to, but preceding, conventional reading and writing (Clay, 1966; Sulzby, Teale, and Kamberelis, 1989; Whitehurst and Lonigan, 1998; Reese, Cox, Harte, and McAnally, 2003).

Although various perspectives exist on the emergent literacy stage, each offers a framework for understanding children's emergent literacy. These frameworks can be categorized based on their primary perspectives. The Developmental Perspective emphasizes the progression in acquiring emergent literacy knowledge and skills (Goodman, 1986; McCormick and Mason, 1986).

Goodman's (1986) framework outlines five key components in which children's knowledge and skills develop as foundational elements of literacy. These are represented in Figure 2.1.

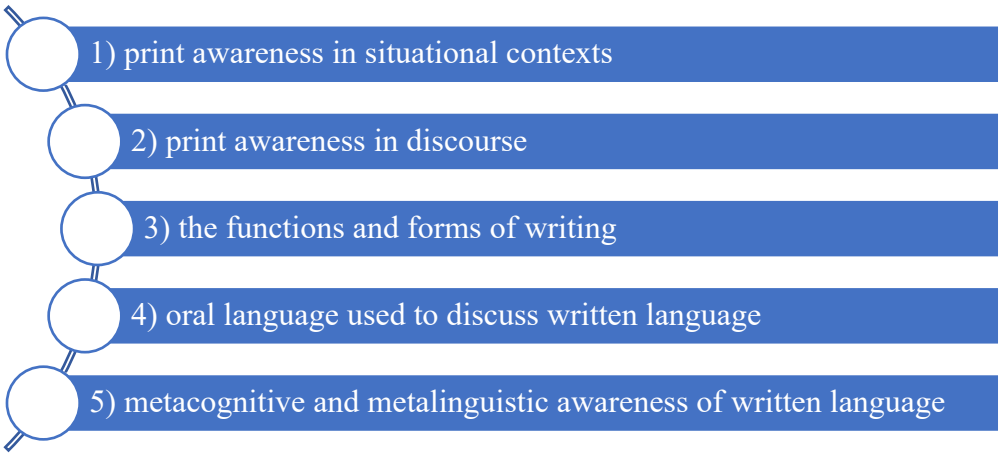


Figure 2. 1. Goodman's (1986) Framework: A Developmental Perspective on the Acquisition of Emergent Literacy Skills and Knowledge

According to Goodman's (1986) framework, children's print awareness in situational contexts initially emerges when they recognize environmental print, such as logos from restaurants and food brands. Next, print awareness in discourse is cultivated through exposure to various forms of print media, including environmental prints, books, and magazines, which support children's understanding of the specific purposes of different printed materials. As children interact with these prints, they learn how to navigate them, such as turning pages in a book or reading from left to right in plain texts. In terms of writing, children begin by scribbling or creating letter-like shapes, progressing to more conventional forms of writing as they mature. Oral language related to written language becomes evident when children begin to articulate print functions, such as identifying a book as a source of stories conveyed through words or pictures. Finally, metacognitive and metalinguistic awareness develops as children grasp the meanings of literacy-related terms and can describe their reading experiences using appropriate vocabulary. Goodman (1986) argues that these areas collectively form the foundation for emergent literacy, enabling children to build essential emergent literacy skills and knowledge.

McCormick and Mason (1986) proposed an additional framework for understanding emergent literacy skills and knowledge within the developmental perspective. The scholars claimed that children advance through a "hierarchy" of literacy-related

knowledge and skills as they learn to read. This hierarchical progression includes three levels of emergent literacy: the functions of print, the form of print, and the coordination of print's form and function. These levels are illustrated in Figure 2.2

McCormick and Mason (1986) describe a developmental progression in emergent literacy, where children move through three hierarchical levels of understanding as they learn to read. In the first level, the functions of print and children's literacy understanding are highly context-dependent. They can recognize and read environmental print, such as street signs, within familiar contexts but may struggle to identify the exact words in different settings. At this stage, they recognize that environmental print serves a functional purpose.

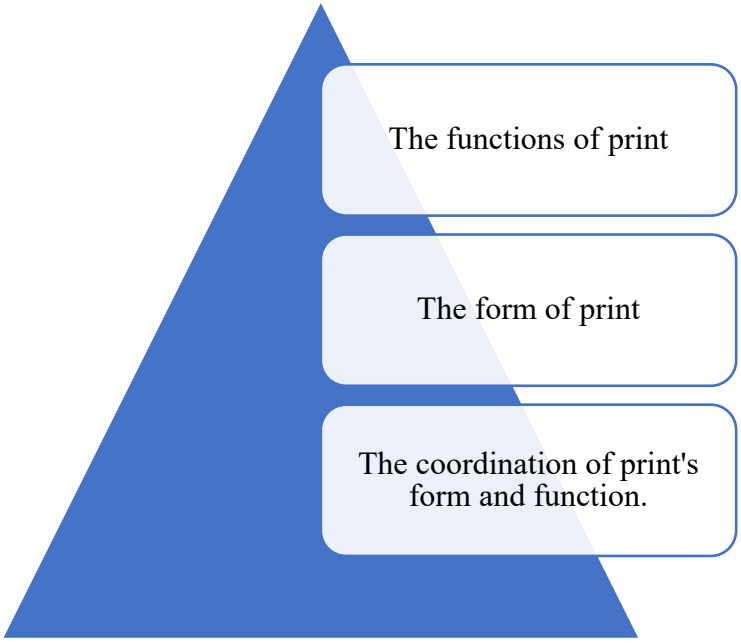


Figure 2. 2. McCormick and Mason's (1986) Hierarchy of Emergent Literacy Skills

The second level, the form of print, is characterized by children's growing awareness of grapheme-phoneme correspondences. As children engage more with reading and experiment with invented spelling, their focus shifts from the function to the form of print. This situation allows them to start recognizing phonetic analysis to printed words, moving beyond reliance on contextual cues like pictures or environmental print. In the final stage, the coordination of print's form and function, children integrate their understanding of both aspects, enabling them to decode words more

efficiently and focus on meaning. This stage displays the transition to conventional reading skills, where children use their knowledge of the print function and form concurrently. Although McCormick and Mason (1986) do not explicitly discuss changes in conceptual knowledge about the reading process, their hierarchy implies that successful development at each level is built upon the foundational knowledge established in the previous stages.

Early frameworks for understanding emergent literacy adopt a developmental perspective, providing insight into how children's conceptual knowledge and literacy skills evolve. Notable among these are the frameworks proposed by Goodman (1986) and McCormick and Mason (1986), both of which suggest a sequential understanding of literacy development. Goodman (1986) identifies five key areas in this process: print awareness in situational contexts, print awareness in discourse, the functions and forms of writing, oral language to discuss written language and metacognitive and metalinguistic awareness about written language. Similarly, McCormick and Mason (1986) describe a hierarchical progression in literacy, where children move through three stages: understanding the functions of print, recognizing the form of print, and eventually coordinating both form and function. These frameworks collectively highlight children's systematic development of emergent literacy knowledge and skills.

2.1.2. Components of Emergent Literacy

The components of emergent literacy arose as researchers recognized the preliteracy stage and aimed to identify the specific knowledge and skills developed during this period (Whitehurst, 2002). Unlike developmental frameworks that outline a sequence in acquiring emergent literacy knowledge and skills, components frameworks focus on what children learn about reading and writing before they become conventional readers and writers and how they demonstrate this knowledge. This perspective faces the challenge of offering a comprehensive description that is neither too broad nor too narrow. Key frameworks in this perspective include those by Storch and Whitehurst (2002) and van Kleeck (1998, 2003), which were summarized and compared to highlight their similarities and differences.

Storch and Whitehurst (2002) created a components framework for emergent literacy that divides children's emergent literacy skills into two main categories: code-related and oral language skills. This framework depends on an earlier model by Whitehurst and Lonigan (1998), which described inside-out skills (knowledge of translating print into sounds) and outside-in skills (understanding the context skills writing). Code-related skills include print conventions, early writing forms, letter knowledge, letter-sound correspondence, and phonological awareness. Oral language skills cover words, grammar, storytelling, and general knowledge about the world. The framework shows that code-related and oral language skills strongly influence each other and early reading development during early childhood years. However, after the critical years, these skills affect reading development independently. Storch and Whitehurst (2002) stress that both skills should be taught together to support emergent literacy development effectively.

Van Kleeck's framework, based on a model by Seidenberg and McClelland (1989) and expanded by Adams (1990), outlines four interconnected components: context processor, meaning processor, orthographic processor, and phonological processor. The context processor helps children understand text through skills like world knowledge, grammar, story structure, book conventions, abstract language, and understanding print functions. The meaning processor involves applying word knowledge and includes skills like word awareness and vocabulary development. The orthographic processor recognizes letters and letter sequences, while the phonological processor converts printed letters into sounds, including skills such as syllable segmentation, rhyming, and phoneme segmentation. This framework highlights the developmental progression of these skills throughout the emergent literacy stage.

The components frameworks in this section highlight similarities and differences in the knowledge and skills that define the emergent literacy stage. Both Storch and Whitehurst (2002) and Van Kleeck (1998, 2003) include components such as letter knowledge, phonological awareness, language skills (like semantics, syntax, and narrative skills), and print conventions. The main differences between these frameworks are the level of detail within the general categories and the specific

components included, with van Kleeck's (1998, 2003) framework providing detailed descriptions. Although these frameworks mainly offer a components perspective, they both recognize the importance of children's exposure to language and literacy in shaping their emergent literacy development. For example, exposure to environmental print is crucial for early sight word knowledge. Factors such as a child's internal motivation to read can also influence their emergent literacy development. This recognition of internal and environmental factors has led to the creation of frameworks that consider these influences in understanding emergent literacy.

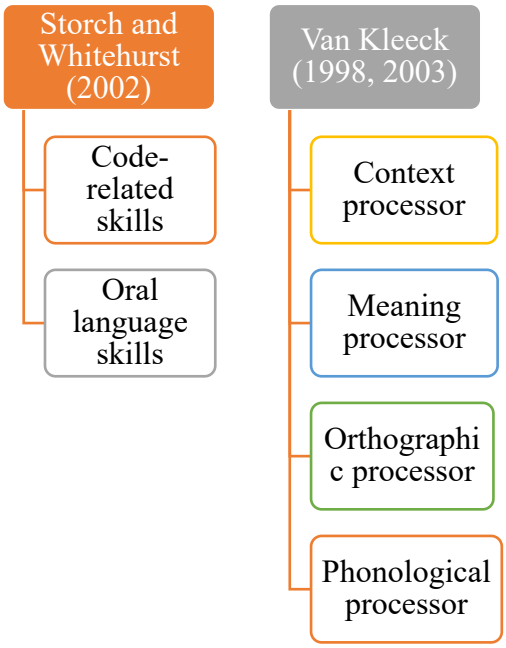


Figure 2. 3. Components Frameworks for Emergent Literacy

2.2. The Role of Environmental Print in Emergent Literacy Skills

Emergent literacy development begins when a baby opens their eyes to the world and continues to evolve throughout early childhood. Young children recognize intricate literacy systems in these formative years by observing conversations and navigating their printed environment, including toy and food logos, road signs, restaurant menus, and billboards (Griffith, Beach, Ruan, and Dunn, 2008). Environmental

prints encompass a variety of elements, including signs, labels, coupons, symbols, toy and food packages, menus, logos, brochures, and billboards (Prior and Gerard, 2004; Horner, 2005). Unlike standard print, environmental print is characterized by attractiveness, colorfulness, uniqueness, functionality, and memorability. These prints typically consist of single or multi-word labels and are commonly encountered in streets, billboards, stores, advertisements, and shopping centers (Neuman and Dickinson, 2003). Figure 2.4 provides visual representations of some examples of environmental print.

Figure 2. 4. Examples of Environmental Prints

Environmental prints that can lack letters, such as recycle symbols, toilet symbols, and traffic signs, fall under the category of functional prints. Functional prints typically convey a message, offering children information and serving as communication material to enhance their emergent literacy knowledge. This communication often revolves around understanding the functionality of the given print (McGee, Lomax, Head, 1988; Goodman, 1986). According to Prior and Gerard (2004), "*Environmental print is one of the first sources of reading material for young children and serves as soil for the roots of literacy*" (p.5). Environmental prints contribute to the natural sensory experiences of young children, helping them understand language structure and function (Kuby, Aldridge, and Snyder, 1994). With the assistance of environmental print, young children focus on graphic, social,

contextual, and grammatical cues, recognized for their crucial emergent literacy skills. (Harste, Burke, and Woodward, 1981).

The importance of environmental print in enhancing emergent literacy skills has been emphasized in many studies. A study by Zamal, Mad Sehat, and Shapiee (2024) investigated the relationship between kindergarten teachers' use of environmental print and the name-recognition skills of four-year-old children, aiming to assess the level of environmental print usage by teachers, evaluate the name-recognition skills of children, and explore the correlation between teachers' use of environmental print and children's name recognition. Data from 123 kindergarten teachers was collected through a Google Forms questionnaire. The study revealed a positive correlation between teachers' use of environmental print and children's name recognition skills, emphasizing the importance of environmental print in early childhood education and its potential to enhance early literacy skills, particularly name recognition.

Moreover, Bigozzi, Incognito, Mercugliano, De Bernart, Botarelli, and Vettori (2023) investigated the emergence of sound-sign correspondence in Italian-speaking 5-year-old preschoolers. The study examines whether preschoolers' word decoding strategies (logographic versus sound-sign processing) vary according to their sociocultural backgrounds (e.g., type of school and sociocultural information provided by parents). A total of 94 children at the end of their final preschool year were tested. Six stimulus logos were used to assess children's ability to decode words and determine the decoding process employed. The findings highlight that many words through sound-to-symbol processing demonstrate emerging awareness of written symbols, while others continue to rely on recognizing whole words. The results indicate that sociocultural factors associated with their schools and families influence preschoolers' awareness of written symbols. These findings imply that by the age of 5, there is a crucial period in which preschoolers begin to differentiate between recognizing words and employing sound-to-symbol correspondence.

In another study, Giacovazzi, Moonsamy, and Mophosho (2021) study aimed to indicate the significance of utilizing environmental print (EP) to enhance language and literacy development in preschool children from underserved communities and

to emphasize the role of speech-language therapists (SLTs) in this process. The research employed a mixed-method, comparative intervention design, gathering data before and after an intervention. Results revealed that children in the intervention group demonstrated improvement on the Concepts About Print (CAP) test, whereas no progress was observed in the comparison group. These findings exemplify the value of utilizing environmental print as instructional material and the positive impact of collaboration between SLTs and teachers in promoting emergent literacy skills in preschool children. Overall, the study demonstrates the substantial benefits of SLT-teacher collaboration and the utilization of environmental print in education, especially for children in underserved communities.

Furthermore, in a study conducted by Vera (2007), the efficacy of utilizing popular culture environmental print to teach pre-kindergarten children alphabet knowledge and print concepts was investigated. The research occurred in an urban, high-poverty school district, involving 56 pre-kindergarten children who wed into control and experimental groups. Over a nine-week intervention, popular culture environmental print, which included logos or characters familiar to children from their everyday experiences, was integrated into lessons focused on alphabet knowledge and print concepts. The findings displayed that cultural and environmental print significantly improved children's acquisition of emergent literacy skills. The experimental group, which received the environmental print intervention, demonstrated a notable improvement in their post-test scores for alphabet knowledge compared to the control group. Notably, English as a second language learners also improved their understanding of alphabet letters after the intervention. Descriptive statistics indicated that both groups exhibited improved print concept knowledge from the pre-test to the post-test. The study concluded that incorporating popular culture environmental print in teaching facilitated better engagement and was a strong motivator for enhancing children's emergent literacy skills.

Neumann and colleagues (2013) conducted a quantitative study on the impact of a multi-sensory reading intervention incorporating EP on 3-4-year-old children's emergent literacy development. After the intervention, the study showed significant improvement in letter formation skills and the ability to read words in standard fonts.

The children who participated in the EP-based intervention retained their emergent literacy skills when retested two months later, while the children who received the intervention maintained their progress. This research highlighted the potential of EP, combined with multi-sensory strategies, to support long-term emergent literacy skills. Neumann et al. also (2013) investigated whether contextual cues in EP might distract children from focusing on the actual print. With the help of eye-tracking technology, the study measured how preschool children ages 3-5 years attended to words in environmental print and standard print. Results indicated that children fixated more on standard print words without contextual cues and that these fixations were not significantly related to print knowledge. However, differences in print fixations across various types of EP suggested that print learning may be facilitated by using EP with larger and more centralized fonts.

Blair and Savage (2006) highlighted the connections between two levels of phonological representation, recognition (epi-linguistic) and production (meta-linguistic) tasks, and early reading and writing skills in pre-readers. The research involved 38 pre-reading children aged 4-5 years who took part in tasks such as identifying letters and environmental print, writing their names, and recognizing EP words. The findings indicated that phonological awareness and letter-sound knowledge did not correlate with EP recognition. However, the accuracy of name-writing and identification were linked to both levels of phonological awareness. The study suggests pre-readers may initially employ meta-linguistic phonological awareness in name writing and identification before advancing to reading with the help of children's recognition of environmental prints.

Yannikopoulou (2006) examined how preschoolers in Greece, a monolingual society that uses Greek and Roman alphabets, interact with environmental print. The curriculum in Greek preschool education does not formally teach letters from either alphabet, making EP a critical source for children's early literacy hypotheses. Researchers tested 504 preschoolers' ability to differentiate between Greek and Roman letters commonly found in urban environments. The findings revealed that while preschoolers could not read, they could differentiate between the two

alphabets, indicating that receptive language skill plays a significant role in EP reading and that letter recognition begins through environmental exposure.

Mol and Bus (2011) conducted meta-analyses to examine whether the association between print exposure and reading-related components strengthens as children develop. By analyzing 99 studies, the researchers found moderate to strong correlations between print exposure and various literacy outcomes across different age groups, such as reading comprehension and spelling skills. Print exposure explained a significant portion of the variance in oral language skills in preschoolers and kindergartners, with this effect increasing through to college-level students.

Zhao et al. (2014) tested whether children could learn to read words from environmental prints (EP) by excluding phonological cues. Researchers examined Chinese preschoolers' ability to recognize words embedded in familiar logos, gradually removing contextual cues. The findings showed that children performed better with familiar logos, but attention to visual word form increased with age. Although younger children relied more on color and logo cues, older children focused more on font cues, suggesting that EP contributes to literacy development, but its effectiveness depends on the child's age and the nature of the contextual cues.

Neumann, Hood, and Ford (2013) examined how mothers naturally refer their children to environmental print and whether maternal and child referencing of environmental print was related to children's emergent literacy and home literacy. A total of 35 mother-child pairs were videotaped, interacting in an environmental print-rich grocery store play area. The results indicated that maternal references to environmental print occurred frequently, and these references were positively related to children's emergent literacy skills, such as letter writing and print concepts. These findings indicate maternal guidance in environmental print may potentially support emergent literacy development in young children.

In brief, in a synthesis of studies, environmental print (EP) emerges as a pivotal element in emergent literacy development. These studies highlight EP's multifaceted role in enhancing literacy across different developmental stages and cultural

contexts. The integration of EP into educational strategies, as evidenced by the varied focus across studies on the role of family, school, and individual emergent literacy skills, demonstrates that effective literacy development strategies must consider the broad spectrum of environmental interactions that influence early learning.

2.3. Environmental Print and Sociocultural Contexts

The related literature review demonstrates that environmental print (EP) is foundational in early childhood literacy (Neumann et al., 2011). It is embedded within the sociocultural context in which children live, influencing literacy development across different cultures, languages, and socioeconomic backgrounds (Sinclair and Golan, 2002). Research has shown that children begin to comprehend the meaning of the print and symbols surrounding them through social interactions, enabling the development of emergent literacy skills (Goodman, 1986; Harste, Burke, and Woodward, 1982; Neuman and Roskos, 1997; Teale and Sulzby, 1986). Children's understanding of EP is shaped by their social and cultural experiences, as evidenced by studies that explore how children assign meaning to print within their daily environments. Weiss and Hagen (1988) conducted a mixed-methods study involving 110 kindergarten students to explore how they understand EP and its purposes. Children were interviewed about ten artifacts, and their responses were both quantitatively assessed and qualitatively analyzed by comparing language use and scores. The study revealed that five- and six-year-old children frequently associated meaning with environmental print on various artifacts. They claim that children's engagement with print in their environment plays a vital role in developing early literacy skills. Orellana and Hernandez (1999) conducted a qualitative study that further illustrated how children value EP due to its social and cultural significance. This study involved children who participated in community walks in an urban setting, sometimes accompanied by older siblings. The researchers found that children engaged more deeply with EP that held personal significance, such as community signs connected to their family's livelihood (e.g., business signs or neighborhood graffiti). This study highlighted the importance of social and cultural

engagement with EP, showing that environmental print is more meaningful to children when it serves a social function and fosters interaction.

Similarly, Smith and Dixon (1995) investigated how children connect with EP, which holds personal relevance. Their mixed-methods study focused on targeted words found in the environment, and preschoolers were presented with various examples of EP, artifacts, and symbols. The researchers found that children more accurately identified EP with personal significance, such as fast-food signs, than less relevant print, such as traffic signs. This research reinforces that children's interactions with EP are shaped by the social relevance and meaning of the print they encounter daily. These findings indicate the importance of considering the social and cultural contexts EP encountered. Vukelich (1994) found that social interaction within print-enriched literacy centers helped children construct meaning from EP. When an adult-guided children's attention to print and encouraged its use, their understanding of the words increased. This study highlights the importance of social interaction and adult scaffolding in helping children make sense of print, aligning with Vygotsky's (1978) theory that learning is a social process facilitated by more knowledgeable individuals.

To summarize, environmental print (EP) plays a foundational role in emergent literacy development by embedding literacy experiences within the sociocultural contexts in which children live. Research indicates that through social interactions, children begin to understand the meaning of the environmental print and symbols around them, facilitating emergent literacy skills. The literature also highlights the importance of adult scaffolding in this process, where educators and caregivers guide children's attention to environmental print, thereby increasing their understanding. These findings show that environmental print is crucial in emergent literacy development, particularly when embedded within meaningful social and cultural contexts and supported by adult interaction.

2.4. Measurement of Logographic Reading with Environmental Print

Logographic reading is considered a stage that precedes conventional reading skills (Ehri and Wilce, 1985). At this stage, visual cues of letters are stored in memory

within their context; however, individuals at this reading level cannot read manuscript forms of words out of context due to their limited knowledge of emergent literacy (Frith, 1985). This process is particularly evident in environmental print (EP), which includes logos, signs, and brand names that children frequently encounter. The ability of children to recognize these familiar symbols relies heavily on visual characteristics, underscoring the importance of logographic reading in their emergent literacy journey (Neumann, 2014). The measurement of logographic reading through environmental print (EP) presents various challenges, primarily due to the absence of standardized assessment instruments. The domain of emergent literacy, which explores how children develop reading skills through daily interactions with text, contributes to this gap. Nutbrown and Hannon (1993) and Whitehurst and Lonigan (1998) emphasize the importance of developing standardized tools to advance research in this area.

One common approach to assessing logographic reading is with EP tests, where children are asked to recognize and name familiar logos or signs in different contexts, such as on actual objects or in decontextualized images. These assessments, however, must be personalized to reflect the specific environmental print that each child encounters, as the diversity of EP across different socioeconomic, cultural, and geographical contexts can significantly influence the outcomes (Snow, 2017; Nutbrown and Hannon, 1993; Whitehurst and Lonigan, 1998). The scoring systems in such assessments vary, with some assigning higher points for correct logo names while others may credit general category identifications (Vukelich et al., 2008).

Furthermore, the variability in research methods contributes to these challenges. The selection of items for EP assessments often depends on the study's specific context, with some choosing universally recognizable items. In contrast, others opt for items that reflect the local environment of the participants (Nutbrown and Hannon, 1993). Additionally, the presentation of EP items to children varies widely, from natural contexts to altered formats like photographs or photocopies, which can affect how children perceive and respond to the items (Whitehurst and Lonigan, 1998). Moreover, the scoring of responses ranges from exact match criteria to more permissive systems that credit conceptually related or partially correct answers,

further complicating the comparison of research findings (Nutbrown and Hannon, 1993).

Many distinct environmental print instruments and checklists have been developed within this field of study, each contributing uniquely to understanding environmental print (EP) recognition among young children. Table 2.1 offers a comprehensive summary of the critical studies frequently cited in the literature, detailing the number of EP items utilized by researchers and the specific phases through which these items were assessed. The development of these instruments began with Hiebert's (1978) investigation, which introduced a two-phase assessment method using 10 EP items. This foundational instrument laid the groundwork for the following studies, which expanded upon the original methodology to include additional phases to comprehensively evaluate environmental print reading ability. For instance, Goodman and Altwerger (1981) extended the assessment to three phases, incorporating 10 and 18 EP items to capture a broader range of children's recognition abilities. Advancements in this area of research are notably illustrated by the instrument developed by Kuby, Aldridge, and Snyder in 1994. Their research represents one of the most detailed and nuanced approaches to EP assessment. It involves six distinct phases and utilizes ten carefully selected EP items, including culturally and socially relevant brands such as Toys R Us, Coca-Cola, Pepsi, and M and M's. In most investigations, environmental print items were chosen based on children's and their parents' insights, ensuring the instrument's relevance.

Table 2. 1. Overview of Environmental Print (EP) Items and Presentation Phases Used in Various Studies

Investigators	Used Number of Environmental Print (EP) Items	Presentation Phases
Hiebert (1978)	10	**2 phases** • Show EP in the natural context • Show the printed form of the EP item

Table 2.1. (continued)

Goodman, Altwerger (1981)	18	**3 phases** • Show EP • Show EP without visual cues • Show the manuscript form of the EP item
Goodhall (1984)	15	**2 phases** • Show EP in its natural context • Show EP without colors and visual cues
Masonheimer, Drum, Ehri (1984)	10	**2 or 3 phases** • Show the photographs of EP items in the natural context • Show EP items • Show the printed form of the EP
Kuby, Alridge, Synder (1994)	10	**6 phases** • Show the actual product, including EP • Show the photograph of the actual product, including the EP • Show the photocopy of the EP item without visual cues (black-white) • Show the yin version of the EP item • Show the typed version of the EP item • Show the manuscript version of the EP item embedded in a simple sentence

While applying these environmental print instruments, investigators typically presented the EP items in various contexts and asked children, "*What does this say?*" The assessment was mainly conducted using a scoring system where each correct response earned 2 points, a contextually meaningful but not exact response (e.g., "*beverage*" instead of "*Coca-Cola*") earned 1 point, and an incorrect response earned 0 points. This evaluation method has provided valuable insights into the developmental trajectory of children's logographic reading skills within real-world environments. By analyzing the progression of these instruments over time, it is evident that the field has evolved towards contextually rich assessments, reflecting a

deeper understanding of how children interact with environmental print in their everyday lives. These developments demonstrate the importance of culturally responsive and methodologically sound tools in accurately capturing the nuances of emergent literacy development (Hiebert, 1978; Goodman and Altwerger, 1981; Kuby, Aldridge, and Snyder, 1994).

2.5. The Role of Receptive and Expressive Skills on Emergent Literacy

Receptive skills refer to the ability to understand and process spoken language, encompassing the reception of auditory stimuli, which are interpreted through auditory-perceptual processes and neural networks to derive meaning (Nelson et al., 2006). Research indicates that receptive language skills typically precede expressive development in infancy and early childhood, establishing a critical foundation for later language use (Benedict, 1979; Gershkoff-Stowe and Hahn, 2013; Goldin-Meadow et al., 1976). For example, studies show that infants can understand significantly more words than they can produce during the early stages of language acquisition (Goldin-Meadow et al., 1976). This developmental trajectory demonstrates that comprehension generally outpaces production, with receptive skills relatively more advanced during the early years (Edwards et al., 2011).

On the other hand, expressive skills involve children's language production to articulate thoughts, desires, and emotions into spoken words and coherent sentences using appropriate syntactic and grammatical structures (Konrot, 2005; Uyanık and Kandır, 2010). Although expressive skills typically follow receptive skills, research highlights that specific content expressive skills may be difficult receptive skills. For instance, studies have documented cases where children could produce grammatical structures, such as third-person pronouns or sentences with relative clauses, before fully comprehending them (Chapman and Miller, 1975; Matthews et al., 2009). These findings indicate the complexity of language acquisition, where production and comprehension may develop asynchronously in specific domains.

The relationship between receptive and expressive skills is particularly significant in the context of emergent literacy, the foundational skills and knowledge that precede

formal reading and writing (Edwards et al., 2011). Emergent literacy encompasses various components, including phonemic awareness, vocabulary development, print awareness, receptive, expressive skills, and letter recognition (Clay, 1991). Research consistently shows that children with a high level of receptive abilities tend to perform better on standardized literacy assessments, demonstrating that these skills are crucial for acquiring emergent literacy (Edwards et al., 2011; Wiig et al., 2004). For example, standardization samples from assessments like the Clinical Evaluation of Language Fundamentals (CELF) and the New Reynell Developmental Language Scales (NRDLS) indicate that children typically exhibit relatively equal receptive and expressive skills, with a slight advantage in receptive skills (Edwards et al., 2011; Wiig et al., 2004).

Developing receptive and expressive skills is intrinsically linked to acquiring emergent literacy. These language skills provide the foundation for understanding and using language and play a critical role in the emergent literacy development of print awareness and the ability to engage meaningfully with environmental print (Clay, 1991). Children with well-developed receptive skills are more likely to acquire print awareness early, facilitating their engagement with written text and laying the groundwork for successful reading and writing in the future (Neumann et al., 2012). Moreover, environmental Print, found in everyday settings such as signs, labels, and logos, significantly enhances emergent literacy. Environmental print is often children's first exposure, and they must write language in a meaningful context. Research by Neumann et al. (2012) demonstrated that exposure to environmental print significantly enhances receptive abilities, children's print motivation, letter recognition, and overall print awareness. The relationship between receptive and expressive skills and emergent literacy is further displayed in studies focusing on specific populations. For instance, children from socially disadvantaged backgrounds are at a higher risk of experiencing language delays, with expressive language skills often being more affected than receptive language skills (Locke et al., 2002; Law et al., 2011). These findings indicate that while receptive language skills might be more resilient in social deprivation, expressive language skills may require more targeted intervention, particularly early childhood (Peers et al., 2000). Understanding the details of this relationship is crucial for clinicians and educators working with at-risk

populations, as it informs the prioritization of assessment and intervention goals (Edwards et al., 2011).

The study conducted by Azazi (2022) aimed to investigate the relationship between children's language development and their early literacy experiences within the home environment. The research sample comprised children aged 36-72 months and their mothers attending kindergartens in the central district of Balıkesir. The findings indicated that the increased frequency with which mothers pointed out environmental prints, such as restaurant and street signs, was associated with improved children's receptive language development. Farver et al. (2007) concluded that the presence of writing materials in the home and their use by children significantly enhance receptive language, expressive language, vocabulary, phonological awareness, and print awareness. Furthermore, research has demonstrated that a rich early literacy environment within the home, particularly involving mother-child interactions, positively influences children's emergent literacy development, including receptive, expressive skills, and verbal language performance (Moss, 2016; Niklas and Schneider, 2013).

Eti and Aktaş Arnas (2016) explored the effects of story-based creative drama activities on the expressive language development of four-year-old children. The study involved 26 children in this age group, all enrolled in preschool education and participated in story-based drama activities. Data were collected using eight-story cards for pre-tests and post-tests, and language samples were obtained to evaluate the children's expressive language development. The analysis focused on the types of words used, the total number of sentences, the total number of words, and the average number of words per sentence. The findings demonstrated that story-based creative drama activities enhanced children's use of verbs, nouns, conjunctions, and adverbs. Furthermore, these activities increased the total number of words used, the total number of sentences, and the average number of words per sentence. Moreover, interactive and regular book reading has been shown to significantly enhance the vocabulary of children with underdeveloped expressive language skills and positively influence their receptive and expressive skills, as well as their emergent literacy dvelopment (Aral, Bıçakçı, and Er, 2017).

2.6. The Impact of Gender on Emergent Literacy Skills

The gender variable, as a demographic characteristic, plays a significant role in oral development, which influences emergent literacy skills. Research indicates that girls tend to begin speaking earlier than boys and exhibit greater sensitivity to words. This difference can be attributed to both hereditary and environmental factors. Biologically, the increased sensitivity observed in girls is explained by their genetic makeup, while environmentally, it is linked to the more frequent communication between girls and their mothers. In such contexts, it is common for boys to engage more in physical play, resulting in observed differences in emergent literacy skills between boys and girls (Millard, 2003).

Many studies have documented gender differences in emergent literacy skills, consistently finding that girls tend to outperform boys in various aspects of emergent literacy from early childhood through adolescence (McTigue et al., 2021; Below et al., 2010; Deasley et al., 2018; Harper and Pelletier, 2008; Rinaldi et al., 2021; Temiz, 2002; Locke et al., 2002). In a study conducted by Temiz (2002), the influence of preschool education on children's language development was explored. The research sample was determined by randomly selecting one preschool from a city center. The study employed an experimental design, incorporating a pre-test and post-test methodology with a control group. The experimental group comprised ten girls and ten boys, all aged three, who were selected through random sampling. The control group included ten girls and ten boys who shared similar parental characteristics with the experimental group but did not attend a preschool institution. The findings revealed a significant difference in test scores between children who attended preschool and those who did not.

Additionally, it was observed that girls who attended preschool demonstrated higher receptive and expressive skills compared to their boys' counterparts. Below et al. (2010) employed a cross-sectional design to assess children's reading skills from kindergarten through fifth grade, revealing that girls scored significantly higher than boys in the early stages of emergent literacy development. However, these differences tended to diminish by fifth grade. McTigue et al. (2021) further explored

gender differences in emergent literacy skills among Norwegian students, finding that girls exhibited an early advantage in emergent literacy skills, such as letter recognition and phonemic awareness. However, this advantage attenuated over time with formal instruction, mainly as boys' emergent literacy skills grew faster across grades. This study claimed the complexity of gender differences in emergent literacy development, suggesting that while girls may begin with an advantage, formal education can help mitigate these differences over time (McTigue et al., 2021).

Additionally, gender is important in how children engage with emergent literacy activities. Deasley et al. (2018) examined the differences in how boys and girls interacted with various types of books in a kindergarten setting. Their findings indicated that girls were more engaged with traditional storybooks, while boys showed more engagement with alphabet eBooks. They argue that the type of reading material may influence the level of engagement and subsequent emergent literacy development in boys and girls differently. Moreover, they highlight that the influence of gender on emergent literacy is not limited to engagement with print material but extends to broader cognitive and social factors (Deasley et al., 2018). Harper and Pelletier (2008) examined gender differences in early reading ability using the Test of Early Reading Ability (TERA), finding that gender differences were more pronounced in specific subtests, particularly those requiring higher-order cognitive skills. Deasley and scholars (2018) argue that gender may interact with cognitive processes differently, influencing how boys and girls develop emergent literacy skills.

The impact of gender on emergent literacy skills is multifaceted and influenced by cultural, social, and cognitive factors. Ahmad et al. (2018) identified that cultural context can heighten or lessen gender disparities in emergent literacy. In their study of Jordanian preschoolers, boys outperformed girls in recognizing common signs in public spaces, a result attributed to cultural norms that afforded boys more opportunities to engage with public signage. This result highlights the importance of considering cultural context when examining gender differences in emergent literacy development. The environment shapes emergent literacy skills, including children's interactions with caregivers. Phillips (1997) explored the relationship between self-

perception, early reading ability, and gender, finding that girls often had more positive self-perceptions regarding their reading abilities, which could enhance their engagement and success in emergent literacy tasks.

Similarly, Schick and Melzi (2016) emphasized the importance of print-related practices in the homes of Latino preschoolers, noting that girls often received more support from caregivers in emergent literacy-related activities, which could contribute to the observed gender differences in emergent literacy outcomes. The role of preschool environment and cognitive abilities also appears to differ by gender, with studies displaying that girls may start school with a slight advantage in verbal abilities (Rinaldi et al., 2021; Locke et al., 2002). These early differences in verbal skills may give girls a head start in emergent literacy development. However, this advantage can be mitigated by effective teaching strategies that support boys' emergent literacy growth (Rinaldi et al., 2021).

2.7. Common Strategies in Environmental Print Investigations

Environmental print studies frequently incorporate instructional strategies rooted in play-based approaches, multi-sensory methods, and scaffolding (Prior and Gerard, 2004; Neuman and Roskos, 1993; Kuby and Aldridge, 1997; Neumann et al., 2012; Neumann et al., 2009). The relationship between environmental print and these instructional strategies highlights their significance in emergent literacy development.

Play is a fundamental component of cognitive development, as underscored by Piagetian theory, which posits that play facilitates the development of children's thinking abilities (Piaget, 1962; Berk, 2005). Symbolic play serves as a medium through which children express their inner thoughts and ideas, thereby linking thought with action through language (Prior and Gerard, 2004). Similarly, Vygotsky (1978) emphasized the role of play in fostering abstract thinking, showing that representational play, where children use objects to represent other things, prepares them for future literacy tasks, including reading and writing. This close relationship between representational play and literacy indicates the importance of play-based

approaches in emergent literacy (Prior and Gerard, 2004). In environmental print research, play-based approaches are often operationalized by incorporating environmental print into learning centers where children are indirectly encouraged to engage with print-rich environments. Neuman and Roskos (1993) found that when children are provided with opportunities to explore environmental print through play, their motivation to engage with print and their print awareness and logographic reading skills are significantly enhanced. Moreover, adult guidance plays a crucial role in this process, as adults help children interpret the meaning of environmental prints, further supporting their emergent literacy development (Kuby and Aldridge, 1997).

The multi-sensory approach is predicated on activating multiple sensory pathways that are visual, auditory, kinesthetic, and tactile, facilitating the brain's integration and processing of information (Orton, 1937). This approach has been widely employed in educational settings, particularly early childhood education, to promote emergent. Although limited research has been conducted specifically on the effects of multi-sensory approaches on emergent literacy, existing studies reveal that multi-sensory experiences can significantly enhance young children's emergent literacy acquisition when applied in both home and classroom settings (Neumann, Hyde, Neumann, Hood, and Ford, 2012). In environmental print, the multi-sensory approach is convenient for young learners, as it engages them in an enjoyable and interactive process of discovering print in various formats (Neumann et al., 2012). When combined with scaffolding, Neumann, Hood, and Neumann (2009) demonstrated that the multi-sensory approach contributes to developing emergent writing skills, alphabet knowledge, and print motivation.

Scaffolding, grounded in Vygotsky's (1978) sociocultural theory, refers to the support provided by more knowledgeable individuals to help children perform tasks beyond their current capabilities. This concept is particularly relevant in environmental print (EP), where adult guidance can facilitate the transition from recognizing familiar logos to developing more complex literacy skills, such as phonological awareness and alphabetic decoding (Adams, 1990; Baker et al., 1998). Neuman and Roskos (1993) and Vukelich (1994) demonstrated that children who

engaged with EP in print-enriched environments under adult guidance significantly improved print knowledge and emergent literacy skills. In addition to traditional scaffolding methods, integrating multi-sensory strategies has enhanced literacy development. Neumann and Neumann (2010) found that combining EP with visual, auditory, kinesthetic, and tactile experiences significantly improved children's letter knowledge and early writing skills. This multi-sensory approach allows for a more meaningful engagement with EP, promoting the shift from logographic reading to more advanced reading skills.

Further, research by Rule (2001) and Neumann et al. (2013) demonstrated the effectiveness of using EP to teach early reading and writing concepts, particularly when integrated into literacy centers or classroom settings. These studies reveal that children's interaction with EP in natural learning environments supports the implementation of literacy skills across various texts and contexts. Kuby and Aldridge (2004) also found that children who engaged with EP during center activities scored higher on logographic reading tests, especially when recognizing words in different fonts. These findings display the potential of EP as a valuable literacy instruction tool, provided children are given opportunities to engage with environmental print in diverse and meaningful ways. Moreover, scaffolding is essential in both home and classroom environments. Neumann and Roskos (1993) investigated the role of parental scaffolding in children's emergent literacy development. Parents were trained in scaffolding techniques, while other groups were passive observers or participated in regular daily activities without additional training. The results revealed that children whose parents used scaffolding techniques exhibited significantly higher levels of emergent literacy and logographic reading skills. Neumann et al. (2012) further emphasized the importance of scaffolding in supporting children's engagement with EP across various settings.

2.8. Theoretical Framework

The theoretical foundation of this study is rooted in Piaget's Cognitive Developmental Theory (1962), Vygotsky's Sociocultural Theory (1978), Marie Clay's Emergent Literacy Theory (1991), and Frith's Theory of Reading Acquisition

(1985). These frameworks form the basis for understanding and exploring the research topic, providing a comprehensive perspective to analyze emergent literacy knowledge dynamics. Vygotsky's emphasis on scaffolding and the role of the zone of proximal development (ZPD), Clay's insights into using instructional scaffolding in emergent literacy acquisition, Frith's claims about reading acquisition, and Piaget's constructivist perspective collectively contribute to shaping the theoretical underpinning of this study.

2.8.1. Piaget's Cognitive Developmental Theory

Piaget's Cognitive Developmental Theory (1962), rooted in constructivism, posits that children actively construct knowledge through their interactions and experiences within the environment. Central to this theory are the concepts of schemas, which serve as the organizing units of understanding. These schemas are formed through the processes of assimilation and accommodation. Assimilation involves incorporating new information into existing schemas. Unlike assimilation, accommodation enables individuals to create or understand something in a new or different way. This adaptive process is prompted by disequilibrium, a discomfort experienced when individuals encounter new information that challenges their schemas. To maintain cognitive equilibrium, individuals generally strive to remain comfortable until exposed to new information (Piaget, 1962).

Piaget's framework comprises four stages, each with individual substages, offering a comprehensive map of children's expected and observable behaviors. The sensorimotor stage aligns closely with infancy and toddlerhood, emphasizing the role of sensory experiences and motor actions in cognitive development. As children progress into the preoperational stage during preschool, symbolic thinking becomes advanced, and language use becomes intricate. In language development, parents and educators are encouraged to engage in various activities, such as singing, talking, and storytelling, coupled with physical interactions. These activities are particularly relevant during the sensorimotor stage, where children actively explore their environment through tactile experiences. These experiences contribute to schemas, which children apply to comprehend and communicate about the world.

Transitioning to the preoperational phase, children exhibit more sophisticated symbolic thinking and use language to articulate thoughts and ideas. This phase shifts from primary language and gestures to more complex and detailed verbal expressions. Children in the preoperational stage can express thoughts about objects or individuals not immediately present, showcasing an elevated level of symbolic thinking. Supporting children in the preoperational phase involves providing opportunities for activities like pretend play, engaging in social conversations, and using language to solve various tasks. These activities contribute to developing complex language skills and further enhance children's cognitive growth within the framework of Piaget's theory (Piaget, 1962).

Based on Piaget's Cognitive Developmental Theory (1962), this study examines how children construct knowledge through their interactions with environmental print. This inquiry is grounded in Piaget's concepts of assimilation and accommodation, which describe how children either incorporate new information into existing cognitive frameworks or adjust these frameworks to integrate new experiences. The study primarily centers on the sensorimotor and preoperational stages of development, focusing on how environmental print influences the development of receptive and expressive skills related to fundamental concepts such as colors and shapes and logographic reading skills. By analyzing how environmental print facilitates the formation of cognitive schemas, this research aims to explain the pivotal role of environmental print interaction in advancing children's emergent literacy outcomes.

2.8.2. Vygotsky's Sociocultural Theory

Vygotsky's sociocultural learning theory emphasizes the social dimension of children's cognitive development (1986). He proposed that cognitive growth is a product of interpersonal interactions, resulting in the internalization of acquired knowledge within the child. Following this theoretical perspective, children achieve optimal learning outcomes when actively involved with individuals possessing more excellent expertise. Vygotsky introduced the concept of the zone of proximal development (ZPD) to define the range within which a child can benefit from guided

learning experiences. He describes it as "*the distance between the actual developmental level as determined by the independent problem solving and the level of potential development as determined through problem-solving*" (Vygotsky, 1978, p 86).

This dynamic occurs through the child's interaction with a more knowledgeable peer or an adult. Through this collaboration, the experienced participant imparts cultural knowledge to enhance the child's understanding. Adult-child interaction, a crucial element in this theory, relies on language use. Vygotsky argued that thought and language are interconnected, and learning occurs through interplay (1978). Scaffolding, a technique employed by adults, guides the child's learning within the ZPD by adjusting the level of assistance based on the child's identified needs. This scaffolding process serves as a framework to elevate the child to a higher level of independent knowledge (1978).

This study employs Vygotsky's sociocultural theory to investigate the impact of environmental print (EP) on children's emergent literacy development within the Zone of Proximal Development (ZPD). According to this theory, children's learning experiences are enriched through interactions with adults, who provide essential scaffolding (Vygotsky, 1978). In this context, the study examines how guided engagement with EP can enhance children's literacy outcomes, particularly in their ability to recognize and comprehend written cues in their surroundings. Moreover, this theoretical framework informs the exploration of children's receptive and expressive skills, particularly concerning basic color and shape concepts, through their interaction with EP. By emphasizing the social dimensions of learning and the role of adult support, this research aims to assess the efficacy of EP in fostering emergent literacy skills, emphasizing the importance of interactions in bridging the gap between children's current abilities and their potential growth.

2.8.3. Marie Clay's Emergent Literacy Theory

Marie Clay's emergent literacy theory establishes a strong connection between the instructional scaffolds employed by educators to foster young children's early

reading, writing, and oral language skills (Clay, 1991). In alignment with Vygotsky's principles, Clay asserts, "*The essence of successful teaching is to know where the frontier of learning is for any pupil on a particular task*" (Clay, 1991, p. 65). By adopting this perspective, Clay emphasizes the significance of discerning an individual child's zone of proximal development (ZPD), enabling educators to leverage learning opportunities for enhanced literacy development. The instructional practices advocated by Clay in emergent literacy highlight the dynamic interactions between educators and children, focusing on the social supports and collaborative contexts co-created by children and educators (Clay, 1991). Clay acknowledges that children construct their learning within their developmental histories, prior knowledge, and past experiences with complex tasks (Clay, 1998). The core of emergent literacy theory centers on understanding how children process information and their problem-solving strategies.

Furthermore, educators play a role in encouraging children to share their learning insights, transforming them into valuable literacy resources for their peers (Clay, 1991). Clay highlights the significance of teacher scaffolding as an invaluable support mechanism for children's literacy learning, conceptualizing teaching as a dynamic interaction between the child and the educator or another expert (Clay, 1998). Consequently, she emphasizes the importance of precise instructional approaches that enhance the child's capacity to explore and employ strategies, recognizing that literacy development is a unique journey for each child. In this context, she claimed that understanding emergent literacy approaches requires teachers to carefully consider the opportunities provided to children for completing assigned tasks, considering their access to previous experiences and prior knowledge (Clay, 1998).

Marie Clay's Emergent Literacy Theory (1991) forms the core framework for this study, particularly highlighting the critical role of instructional scaffolding in developing emergent literacy skills. Relying on this foundation, the present research explores how environmental print activities can be strategically designed to facilitate children's acquisition of logographic reading skills and their understanding of basic color and shape concepts. This focus on instructional scaffolding informs the study's

methodology, aiming to illustrate how effective scaffolding practices can enhance children's participation and learning outcomes in preschool environments.

2.8.4. Frith's Theory of Reading Acquisition

Although different reading acquisition models of reading vary concerning their specifics, they share a common framework in which children progress through sequential stages, with each stage representing a higher level of complexity. These stages are based on the skills and knowledge acquired in earlier stages, reflecting a cumulative process in reading development (Adam, 1990). Frith's theory of reading acquisition (1985) exemplifies this framework, developmental stages correlated with age and experience. According to Frith's theory of reading acquisition (1985), the initial logographic stage is characterized by immediately recognizing symbols, images, or words. Children in this stage showcase emerging logographic understanding, exemplified by their quick identification of familiar logos like McDonald's. Progressing to the alphabetic stage, children use letter symbols to represent the sounds heard in individual words. While displaying an emerging grasp of sound and symbol relationships, though not always comprehensively or accurately. The internal vowel sound may not be fully recognized at this juncture. In the orthographic stage, the third and final stage, children internalize spelling patterns, recognizing and reproducing words with increasing automaticity. Readers at this stage do not require sounding out familiar words but may pause when encountering new words or letter combinations. Throughout these stages, children progressively master intricate facets of thought and language. Teachers must adapt their approaches to effectively foster the child's growth at each stage, according to Frith's model (1985). In this theory, children continually acquire novel skills that build upon and extend from the preceding stage, portraying a developmental progression. In infancy, these stages are sequential and developmental, with each stage building upon the skills acquired in the previous ones (Frith, 1985).

Frith's Theory of Reading Acquisition (1985) offers an essential framework for this research, which focuses on improving preschool children's logographic reading proficiency through environmental print activities. Frith's model focuses the

progression of reading development, beginning with logographic recognition and advancing to phonological and orthographic processing (Frith, 1985). Concerning this study, Frith's theory provides insights into how children initiate logographic reading by identifying environmental prints like logos, serving as foundational steps toward more advanced reading stages.

To sum up, this study integrates multiple theoretical perspectives, including Piaget's theory (1962), which highlights the active role of children in constructing knowledge. It also incorporates Vygotsky's (1978) emphasis on social interaction, underscoring the importance of guided learning through scaffolding within the zone of proximal development. Additionally, Clay's Emergent Literacy Theory (1991) emphasizes the critical role of instructional scaffolding in fostering emergent literacy skills. Frith's Theory of Reading Acquisition (1985) further supports the research by outlining the sequential stages of reading development. Together, these theoretical frameworks provide a comprehensive foundation for understanding emergent literacy development in this study.

CHAPTER 3

METHODOLOGY

This chapter begins with the purpose of the study and a discussion of the rationale for the qualitative research approach. Next, a review of the justification for the case study design, methodology, the unit of analysis/case selection, the participants' recruitment procedures, and profile was introduced. After that, data collection procedures, instruments, and details about the data analysis were presented. Finally, the strategies to establish trustworthiness, ethical considerations, and study limitations were followed.

3.1. The Purpose of the Study

The current study aimed to explore 48- to 54-month-old preschoolers' logographic reading and receptive, expressive skills on basic colors and shapes. The secondary aim was to demonstrate the similarities and differences between children's outcomes before and after implementation. The research questions that guided this study are as follows:

RQ-1. What are the levels of logographic reading and receptive, expressive skills on basic colors and shapes of 48-54-month-old preschool children?

RQ-2. How do the environmental print activities alter 48-to 54-month-old preschoolers' outcomes regarding logographic reading and receptive, expressive skills on basic colors and shapes?

2.1. How do the environmental print activities alter 48-54-month-old preschoolers' logographic reading skills?

2.2. How do the environmental print activities alter 48-54-month-old preschoolers' receptive and expressive skills on basic colors and shapes?

2.3. How do the environmental print activities alter 48-54-month-old preschoolers' logographic reading and receptive, expressive skills on basic colors and shapes in terms of their gender?

3.2. The Design of the Study and Methodology

According to Burns and Bush (2004), research design is a structured set of advanced decisions, forming a master plan that outlines the methods and procedures to collect and analyze needed information. Identifying optimal investigative strategies to address research questions is contingent upon a comprehension of the methodological assumptions in the selected research design.

According to Bogdan and Biklen (2007), the investigator is the main instrument for gathering and analyzing the data in qualitative research. Furthermore, the data gathered for qualitative research consists of detailed descriptions of people, locations, languages, and behaviors, as opposed to quantitative studies, which collect data using statistics. Moreover, qualitative research emphasizes the research process rather than solely on the research findings. Additionally, researchers in qualitative studies are inclined towards inductive data analysis, often leading to the development of theories. Finally, qualitative researchers are mainly concerned with understanding participants' perspectives on how they derive meaning from their lives (Creswell, 2014). The present research adopts qualitative research design as its foundational framework, relying on a systematic pathway for the researcher to effectively execute tasks and thoroughly investigate the research problem. In this context, approaches to address research questions are compatible with the qualitative research paradigm.

There are many qualitative design methodologies, and the choice for this research is a case study, selected to offer information into the efficacy of the set of activities with environmental print on preschoolers’ logographic reading and receptive and expressive skills on primary colors and shapes. Alternative qualitative design approaches were considered, including narrative, ethnographic, phenomenological, grounded theory, and case study (Creswell, 2014). A narrative study centers on participants' experiences and the stories they convey. The narratives participants

share is interconnected with their cultural and social contexts, rendering them inseparable (Bloomberg and Volpe, 2019). Ethnographic designs serve the purpose of depicting, analyzing, and interpreting the unique attributes of a culture. Researchers utilize ethnographic design to explore and gain insight into the lives of a particular group of people. This design's critical data collection method entails extensive observation over an extended period (Creswell, 2012). In phenomenology, the researcher identifies a particular phenomenon and aims to comprehensively describe its shared characteristics (Bogdan and Biklen 2007). The method employed for data collection in this research type involves conducting in-depth interviews. In grounded theory, another qualitative design approach, researchers can formulate a hypothesis to elucidate a particular phenomenon. Grounded theory is employed when existing theories prove insufficient in addressing the identified problem or the participants slated for study (Creswell, 2012). These defining characteristics emerge as a conceptual framework for explaining the nature of qualitative research.

In qualitative research, the setting holds significance, and the term '*naturalistic*' implies that the research takes place in the natural settings of the subjects or cases, such as classrooms, homes, or communities. Unlike quantitative research, qualitative research emphasizes understanding actions within their natural context (Bogdan and Biklen, 2006). Cohen et al. (2007) also highlight the importance of understanding the educational environment in research methods in education. Thus, in this case study, the relationship between the children, mothers, teacher, classrooms, and the positions in preschool were all relevant to putting the data collected into context. Additionally, prepared activities were taken place in the children's class. Conducting fieldwork in a classroom setting is distinctive due to the multifaceted and multileveled nature of data collection (Bogdan and Biklen, 2006). The present study aimed to capture children's logographic reading and receptive, expressive skills on primary colors and shapes in free play time via observations.

The current study employed an explanatory case study design for four fundamental reasons. First, this case study serves as an empirical inquiry method that delves into present phenomena, exemplified in this study by logographic reading and receptive, expressive skills on colors and shapes of preschoolers within the authentic context of

their real-life surroundings, specifically within the classroom. This approach is particularly relevant when separating the phenomena from their contextual elements, which proves challenging, as Yin (1994) highlighted. Secondly, in case study design, the researcher focuses on the case and aims to demonstrate its significant interactions with all dimensions. This situation makes the case study unique and differentiates it from other research designs with this aspect (Cronbach, 1975). It is supported that a case study examines the process in all its dimensions and provides the other participants with an interpretation of the phenomenon (Merriam, 1998). Thus, the research questions can be determined using a holistic approach, and the collected information can be analyzed holistically (Bogdan, Biklen, 2007).

This investigation, activities with environmental print for children developed and implemented with the help of effective strategies, such as scaffolding and activities in the preschool classroom, and the effectiveness of environmental prints on children's emergent literacy skills explained based heavily on this process. More specifically, an explanatory case study is appropriate for this study. Yin (2009) proposed that an explanatory case study is used when the researcher seeks to answer questions to demonstrate the presumed causality in real-life interventions. In this way, the researcher would have a chance to establish a link between the explanations and implementation with activities effects. Thirdly, Merriam (2009) highlighted that case studies include thick (rich, detailed) descriptions and have the analysis of a bounded system. In a similar vein, Creswell (2007) claims that a case study is an appropriate research design when the researcher investigates a bounded or multiple-bounded system. It is possible with the help of various data collection tools such as pre-post semi-structured interviews, classroom observations, checklists, logographic reading tests, and audio-visual materials because they provide in-depth information. In the current study, multiple sources of evidence allow researchers to define the complex phenomenon of investigating the effects of increasing awareness of environmental prints on logographic reading and receptive and expressive skills on colors and shapes in the preschool classroom. Furthermore, children from low and middle socio-economic status (SES) were recruited for the study, and each child was stated as a case. This study was conducted as an explanatory case study to explain the similarities and differences between cases regarding the effectiveness of

increasing environmental print awareness on children's logographic reading and receptive, expressive skills on colors and shapes.

Case studies are formulated to elucidate participant perspectives through various data sources. Stake (1995), in his work "*The Art of Case Study Research,*" provides insights into conducting in-depth interviews and employing case study methodology in research. Stake (1995) covers aspects such as data gathering, document review, coding, sorting, and pattern analysis and delineates the roles of the researcher and the significance of triangulation in reporting a case study. Yin (1994) has identified six fundamental sources of evidence integral to case study research, each demanding distinct skills from the researcher. These sources encompass documentation, archival records, interviews, direct observation, participant observation, and physical artifacts. In developing the eight case studies, all six sources were incorporated to elucidate participants' perspectives, aligning with the recognized significance of multiple data sources for study reliability, as emphasized by scholars such as Stake (1995) and Yin (1994). In this study, the primary method chosen for data collection was interviewing. Semi-structured interviews were conducted with a class teacher and eighteen mothers throughout the data collection phase from April 2023 to June 2023.

In this study, the methodology is based on an explanatory case study. The study aims to investigate whether planned activities incorporating environmental print change the logographic reading and receptive, expressive skills on colors and shapes for children aged 48-54 months. For this purpose, a class in a preschool located in a low-medium socioeconomic district of Sincan was selected. Sincan district is in Ankara and generally accommodates a population of lower-middle socio-economic status. Socio-economic indicators published by the Turkish Statistical Institute (TÜİK) demonstrate that Sincan has lower levels of income, educational attainment, and employment rates compared to the general averages for Ankara (TÜİK, 2022). This information supports the classification of Sincan as a district with a lower-middle socio-economic status.

Before the implementation of activities, pre-interviews were conducted with the class teacher and mothers. In these interviews, questions were posed to mothers and

teacher regarding the children's awareness of environmental print, logographic reading skills, and using colors and shapes in environmental prints regarding receptive, expressive skills. Moreover, logographic reading tests were administered to children to determine their logographic reading skills. Activities prepared by the researcher using 20 environmental prints were implemented twice a week for ten weeks. Throughout the process, children were observed once a week during free playtime.

Table 3. 1. Research Design

Before the Implementation	**Implementation**	**After the Implementation**
Children Logographic Reading Test	**Age Group:** 48-54 months old ONE KINDERGARTEN One class 10 Weeks 20 activities (18 children) **OBSERVATION (Each week)**	**Children** Logographic Reading Test
Mothers Demographic Information Form Information Form on the Frequency of Interaction between the Environmental Print and Child Pre-Interview Questions		**Mothers** Post-Interview Questions
Teacher Pre-Interview Questions Basic Concept Knowledge Checklist		**Teacher** Post-Interview Questions Basic Concept Knowledge Checklist

After the implementation, the logographic reading test was administered to the children again. In addition, post-interviews were conducted with the class teacher and mothers to gather their opinions on any change in the children's logographic skills. The present study employed various data collection methods to enhance the overall data collection process, including interviews, observations, logographic reading tests, and checklists. Using evidence from these diverse sources allowed for cross-referencing and contributed to a more detailed analysis, resulting in a deeper understanding of the research findings. Methodological triangulation was

emphasized during the data collection phase, using sources such as semi-structured interviews with teacher and mothers, logographic reading tests, observations with children, and the checklist with the teacher. The research design, research questions, and data alignment are shown in Table 3.1 and Table 3.2.

Table 3. 2. Research Questions and Data Alignment

	Data Sources	**Participant/s**	**Data Collection Time Interval**
RQ-1. What are the levels of logographic reading and receptive and expressive skills on colors and shapes of 48-54-month-old preschool children?	Logographic Reading Test Pre-Interview Protocols Basic Concept Knowledge Checklist	Children Mothers Teacher	Pre-Implementation
RQ-2.1. How do the environmental print activities alter 48-54-month-old preschoolers' logographic reading skills?	Observation Logographic Reading Test Pre-Post Interview Protocols Pre-Post Interview Protocols Basic Concept Knowledge Checklist	Children Mothers Teacher	Throughout the Implementation (Observation) Pre/Post Implementation (In-depth Interviews) Pre/Post Implementation (In-depth Interviews)
RQ-2.2. How do the environmental print activities alter 48-54-month-old preschoolers' receptive and expressive skills on colors and shapes?	Observation Pre-Post Interview Protocols Pre-Post Interview Protocols Basic Concept Knowledge Check List	Children Mothers Teacher	Throughout the Implementation (Observation) Pre/Post Implementation (In-depth Interviews) Pre/Post Implementation (In-depth Interviews)

Table 3.2. (continued)

RQ-2.3. How do the environmental print activities alter 48-54-month-old preschoolers' logographic reading and receptive, expressive skills on colors and shapes in terms of their gender?	All Instruments	Children Mothers Teacher	Throughout the Implementation (Observation) Pre/Post Implementation

3.3. Role of the Researcher

The researcher brought several years of experience to this study, significantly shaping her perspectives on teaching and learning. Initiating this investigation with strong beliefs about the significance of increasing awareness of environmental print with the help of early literacy instruction, the researcher embraced the role of a continuous learner throughout the study. This evolving perspective was important, prompting reflective considerations of all research procedures and findings.

Throughout the current research, one of the researcher's primary responsibilities was to gather data during interviews with the preschool teacher and the mothers. The researcher needed to maintain awareness of both verbal and non-verbal communication with the participants, as this awareness could potentially influence their responses to interview questions and subsequently impact the study results. Additionally, the researcher collected data during observations of children's logographic reading and receptive, expressive skills, including receptive and expressive knowledge of basic colors and shapes concepts. However, the researcher adopted a non-participatory observation approach to ensure that their presence did not influence children's outcomes.

The researcher is also responsible for analyzing and interpreting the collected data. According to Merriam (2009), the researcher is responsible for data collection and analysis in qualitative studies. Acknowledging the potential for researcher bias, the researcher detailed specific approaches employed to enhance the credibility and

reliability of the research. These approaches are explained, addressing matters of trustworthiness in this chapter.

3.4. The Unit of Analysis/Case Selection

3.4.1. Selection of the Sites

Specific criteria guided the process of selecting the site for the case study. The main criterion for choosing the site is that the children should all be from the low to medium socio-economic status category. To serve this purpose, a public preschool from an area of Ankara with low to medium socio-economic status was selected.

Following the selection of the school, a meeting was held with the school principal to provide an overview of the study. Upon obtaining the principal's approval, the classroom (48-54 months age group) and the respective teacher were identified. Subsequently, communication was initiated with both the teacher and the mothers. According to the information provided by the school principal, the chosen preschool, serving as the focal point for this case study, is distinguished by its composition of 14 teachers and 225 children. The institution's facilities include five classrooms, a multipurpose hall, a playroom, and a library housing an extensive collection of approximately 1000 books. Operating under a dual educational model, the school conducts morning classes from 08:00 to 13:00 and afternoon sessions from 13:00 to 18:00.

3.4.2. Recruitment of Participants

In the current study, purposive sampling is employed for participant selection. This approach aligns with the case study methodology, as Hancock and Algozzine (2006) advocated, emphasizing the exploration of multiple realities within real-life contexts through a holistic lens. Purposive sampling is considered the most suitable strategy for this study due to its efficacy in generating high-quality data that directly addresses the research objectives, as noted by Patton (2002), Yin (2009), and Merriam (1998).

The selection criteria for the purposive sampling procedure are grounded in the literature on emergent literacy and environmental print studies (Neuman and Celano, 2001; Vera, 2011; Whitehurst and Lonigan, 1998). The focus on children from low and medium socioeconomic status (SES) is supported by claims that these children have less exposure to various environmental print materials in their daily lives, which could lead to deficits in emergent literacy skills (Neuman and Celano, 2001). It is expressly noted that environmental print could uniquely contribute to improving emergent literacy skills among low to medium-SES children, thus requiring further research (Vera, 2011). The study examines how environmental print activities can bridge emergent literacy skills gaps among preschoolers with low-middle SES.

Children aged between 48 and 54 months were included in this study. The age range of 48 to 54 months is a critical period when children develop their language and symbol recognition capabilities at the highest level. Children rapidly develop literacy skills such as letter recognition and word decoding (Whitehurst and Lonigan, 1998). Interventions at this stage are particularly effective as children's ability to interact with written texts rapidly evolves (Whitehurst and Lonigan, 1998). The focus on environmental print for this age group aims to provide valuable insights into how these interactions can be optimized to support emergent literacy development.

Children with diagnosed speech disorders, as evidenced by official reports, are excluded from the study. This criterion is crucial because speech disorders can affect the clarity of verbal responses, making it challenging to effectively analyze data related to language and emergent literacy development.

The final criterion requires that Turkish is the primary language spoken in the children's homes, ensuring that the children's mother tongue is Turkish. Before recruitment, a comprehensive informational session was conducted with all potential participants, including children, mothers, and the teacher. This session aimed to inform them about the study process, allowing them to make voluntary decisions regarding their participation. It is acknowledged that this clarification is crucial, as it can shape participants' perspectives and introduce a potential source of bias that could impact the research outcomes.

3.4.3. Participant Profiles

The study was conducted during the fall semester of the 2022-2023 academic year with children aged 48-54 months in a classroom setting. A total of 21 children were present in the classroom. Following consultations with their families and obtaining the necessary consent forms, 20 activities were implemented with all the children. Although data was collected from three children diagnosed with language and speech disorders, who also had official reports from a specialist, their data were not included in the final analysis. These children were informed that while their data would be collected, it would not be analyzed. Nonetheless, all children participated in the environmental print activities to prevent discrimination.

The sample size of this study was 18 children ranging from 48 to 54 months old, their mothers, and their class teacher. Table 3.3 provides the completed totals from the demographic information form on the children and their mothers.

Table 3. 3. Participant's Profiles

Children's Profiles	**Groups**	**Number**	**Frequency**
Age Group	48-50 Months	3	16.67%
	51-52 Months	5	27.78%
	53-54 Months	10	55.56%
Gender	Boys	9	50%
	Girls	9	50%
Preschool Experiences	0 year	9	50%
	+1 Years	6	33.33%
	+2 Years	3	16.67%
Mothers Educational Level	Elementary School	3	16.67%
	High School and Associate Degree	12	66.67%
	Bachelor's Degree	3	16.67%
Mothers Occupation	Housewife	11	61.11%
	Working	7	38.89%

Based on the table, the following conclusions can be drawn regarding the profiles of the children and their mothers: In terms of age groups, three children (16.67%) fall within the 48-50 months range, five children (27.78%) within the 51-52 months

range, and ten children (55.56%) within the 53-54 months range. Gender distribution is balanced, with nine boys (50%) and nine girls (50%). Preschool experiences vary, with nine children (50%) having no prior preschool experience, six children (33.33%) having one year of preschool experience, and three children (16.67%) having two years of preschool experience. Analysis of mothers' educational levels reveals that three mothers (16.67%) are elementary school graduates, 12 mothers (66.67%) possess a high school diploma or an associate degree, and three mothers (16.67%) hold a bachelor's degree. Furthermore, 11 mothers (61.11%) are predominantly housewives, while seven mothers (38.89%) are employed.

3.5. Data Collection Procedure

Before initiating the current study, approval was obtained from the Middle East Technical University Human Subjects Review Board (Appendix A) and the Ministry of National Education (Appendix B), emphasizing the commitment to ethical principles in consultations with young children, mothers, and class teacher. The data collection process is illustrated in Figure 3.1.

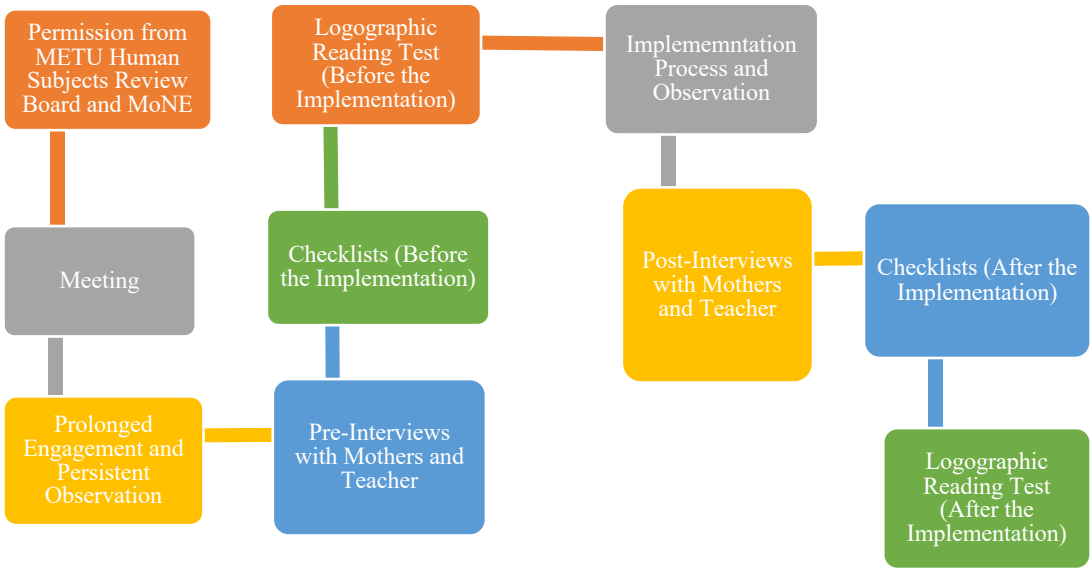


Figure 3. 1. Process of Data Collection

Following the approval of the school principal and the classroom teacher to conduct the study, a face-to-face meeting involving the mothers was organized at the school. In this meeting, the researcher took great care in elucidating the research's purpose, providing a clear understanding to participants regarding their involvement. Following this, informed-consent forms were disseminated to mothers and the class teacher, and a discussion was accompanied by a discussion to clarify their decision-making process regarding their children's participation in the study. This process ensured voluntary participation and guaranteed confidentiality through the informed consent form, upholding ethical standards in the current investigation. During data collection and throughout all activities, verbal consent was obtained from the children regarding their participation. In this process, the researcher considered their developmental level and conveyed it through simple sentences.

The investigator spared two weeks before the implementation process to become familiar with the children, mothers, class teacher, settings, and context. This prolonged engagement builds trust between the investigator and participants, facilitating rich data acquisition during data collection (Lincoln and Guba, 1985). Concurrent with prolonged engagement, the researcher observed the class environment, the educational context in preschool, and children's characteristics in the educational process, exploring intricate details. This persistent observation provides in-depth data for interpretation during the data analysis (Lincoln and Guba, 1985). Aligned with Bogdan and Biklen's (2007) assertion, becoming acquainted with participant groups is essential. It is the initial step in undertaking a qualitative paradigm study before the data collection process.

For the interviews, a detailed plan was created. In this schedule, mothers who participated in pre-interviews selected their available days. The researcher then organized lists lasting 30-40 minutes for each participant and shared the resulting list with the mothers. A reminder message was sent to the mothers one day before their scheduled interview. The pre-interviews with all the mothers and the teacher were completed within ten days. The same strategy was employed in scheduling post-interview sessions, where mothers determined their available days and times.

The researcher engaged in pre- and post-interviews with mothers and the teacher to facilitate both before and after the implementation phase. The design of semi-structured interviews with mothers and the teacher was guided by specific learning objectives related to logographic reading and receptive, expressive skills on colors and shapes and learning activities.

During the two weeks before the implementation process, the teacher was asked to complete checklists for each child to assess children's receptive, expressive skills on color and shape. Throughout the activities considered for the study, the teacher did not include the specific colors and shapes addressed in the study in her curriculum. Similarly, after the implementation, the teacher was given another two weeks to fill out the same checklists for each child individually.

Throughout the implementation process, children were exposed to play-integrated activities, including environmental print materials, twice a week within classroom settings. This implementation process lasted for ten weeks. As seen in Figure 3.2 activities were conducted every Monday and Wednesday during the ten weeks. Each activity, lasting approximately 30-35 minutes, involved introducing and engaging children with four or five environmental print items. On Fridays, a 30-minute observation was carried out during free play time. The schedule presented in Figure 3.2 outlines the weekly activities and observations.

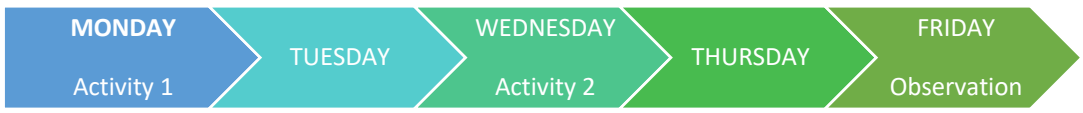


Figure 3. 2. The Schedule for the Weekly Activities and Observations

Environmental print items, aligned with weekly themes, were strategically placed in the Environmental Print (EP) Learning Center designed by the researcher. This center was specifically set up to observe the natural interactions of children with environmental print during their play. To maintain engagement, the design of the centers was modified weekly to keep them attractive and intriguing for the children.

The EP Learning Center was updated every Friday to reflect the EP items addressed in that week's activities. This update included all forms of the EP items and the materials used in the games played during the activities. The EP Learning Center was also video-recorded to capture these interactions.

3.5.1. The Process of Selection Environmental Print Items

Before the logographic reading test was developed, it was decided which environmental print items would be used in the implementation process. Horner (2005) defines child-related environmental prints as more associated with children than adults. Based on this description, the researcher first scanned environmental prints (EPs) like logos found in shopping malls, TV commercials during popular children's shows, YouTube ads, and products used by children. This approach ensured the inclusion of EPs like logos and brands in children's daily lives and interests, helping to explore the impact of EP activities on children's receptive and expressive skills and recognizing of basic concepts like colors and shapes.

During this phase, the researcher selected approximately 112 environmental print (EP) items categorized as child-related EPs, according to Horner's (2005) categorization. This category was chosen because it consists of EPs with which children are more familiar and are more likely to engage due to their direct relevance to the everyday lives and interests of the children. Selecting a notably number of child-related EPs ensures a rich and varied dataset. From the selected pool of 112 environmental print (EP) items, 20 were chosen based on specific criteria designed to support another objective of this study: exploring how environmental print activities through the colors and shapes, including in EPs, affect children's receptive and expressive skills. The criteria for selecting these 20 EP items were primarily focused on the diversity and variety of colors and shapes they presented. The initial focus on child-related EP items was found to be limiting. It restricted the variety of colors and shapes. This diversity is necessary to explore the impact of EP activities on children's language skills. Specifically, it is crucial to understand their knowledge of basic color and shape concepts related to these EPs. Although community-related EP items were added, a brown logo could not be found, and this color was not

included in the study. This situation aligns with findings from a survey of color preferences and recognition in brand logo design, which revealed that brown is the least preferred color in logos (Huang, Lin, and Chiang, 2008).

Consequently, to enhance the variety required and align with the objectives of the research, community-related EP items were added. These items, ranked second in children's interest following child-related items as categorized by Horner (2005), provide a broader spectrum of color sand shapes stimuli. This addition ensures that the selected EP items more effectively represent the implementation process in terms of the visual experiences of children. This strategic selection is aligned with the study's objective to thoroughly examine how exposure to environmental print activities affects young children's logographic reading and receptive, expressive skills on basic colors and shapes.

In this context, the selected environmental print (EP) items have been reviewed by experts in early literacy development and early childhood education. With the help of this revision, selected EP items analyzed the adaptability of different forms in activities, the clarity of basic color and shape concepts, and color quality. Experts have pointed out that some colors in the selected EPs could confuse children. For example, the orange color found in an EP might also be mistaken for yellow. In terms of shape, EPs that include shapes with potential confusion, such as circles and ovals, have been suggested for modification. Following these recommendations, the selected EP items have been reconsidered, and some have been replaced with EP items that are more suitable for the study.

3.5.2. The Components of Activities

The activities to be implemented in this study were prepared based on the Ministry of National Education (MoNE, 2024) preschool program in Türkiye and relevant literature. The MoNE (2024) preschool program aims to support development in children across four key areas: *(i)* cognitive development, *(ii)* language development, *(iii)* physical development and health, and *(iv)* social-emotional development and values. Accordingly, the environmental print (EP) activities included in this study are

designed to foster early literacy skills in children. These activities also incorporate specific learning outcomes and indicators related to the aforementioned developmental areas to ensure a comprehensive and balanced approach. Moreover, the MoNE (2024) preschool program is characterized by its flexibility, spiral structure, and play-based approach, which allows teachers to adapt their planning and instruction to meet the unique needs of their children. The EP activities in this study align with these principles, ensuring that they are *(i)* developmentally appropriate for 48- to 54-month-old children, *(ii)* integrated with play, and *(iii)* organized in a progression from simple to complex in terms of logographic knowledge. These activities also emphasize creating an inclusive, engaging environment that promotes active participation and supports children's development across all domains.

In addition to this, the EP activities used in this study are directly connected to the MoNE (2024) program's focus on play-based learning. The program emphasizes unstructured, semi-structured, and structured play activities. Within this framework, the EP activities in this study support children's cognitive, language development and other developmental areas through semi-structured play. The MoNE (2024) program also highlights the importance of integrating early literacy skills with artistic, dramatic, and physical activities rather than limiting them to desk-based tasks. This study aims to facilitate balanced progress across various developmental areas by incorporating multiple types of activities. For example, children engaged with EP items during art activities or integrated them into dramatic play. This approach allowed children to combine their literacy skills with various types of learning, facilitating balanced development. Activities can be planned and implemented as individual, small-group, or large-group activities (MoNE, 2024). The activities developed within this study have been diversified to accommodate both individual and group dynamics. Individual activities enable children to progress at their own pace, while small group activities create opportunities to enhance social learning and interaction. Large group activities aim to develop the children's abilities to participate within a community and to foster collaborative skills. This combination of individual, small, and large group activities aligns with the developmental concepts outlined by Prior and Gerard (2003), effectively integrating environmental print

across various learning contexts. According to Prior and Gerard (2003), incorporating environmental print games into literacy centers and independent activities serves as a motivating and effective method for children to reinforce recently acquired skills. They propose that educators initiate the process with whole-class and small-group activities while suggesting that the games and activities be presented logically. However, they can be adapted as needed to suit the specific requirements of the children (Prior and Gerard, 2003). Based on this information, the activities were designed to be play-integrated, predominantly incorporating activity types such as small groups and whole classes.

Furthermore, the MoNE (2024) program stresses integrating daily life experiences and familiar surroundings into the educational process. By incorporating environmental print from children's everyday environments, this study enables learners to make meaningful connections between their lived experiences and their learning. This practical application of print knowledge helps children develop a deeper understanding of language and emergent literacy, which aligns with the program's focus on making learning relevant and contextualized for young children. For instance, activities incorporated EP items such as logos, labels, and signs children see in their neighborhoods, homes, and public spaces. Children could connect their real-world experiences with their learning process by engaging with these familiar elements, deepening their understanding of language and literacy.

In this study, an EP learning center has been established to observe children's interactions with environmental print. Consistent with the MoNE (2024) program's principle of learning centers, the EP learning center offers children an environment where they can have different experiences based on their individual needs. This center has various EP materials and formats to enhance children’s print awareness and receptive and expressive skills. Furthermore, by providing individualized learning opportunities where children can explore at their own pace, the EP learning center aligns with the program’s individualized education approach.

Based on those mentioned earlier, the activities centered on Environmental Prints (EPs) specifically developed for this study are designed to engage children in

exploring their logographic reading and receptive, expressive skills on colors and shapes. While preparing 20 activities with environmental prints for this instructional endeavor, a total of 20 environmental prints, encompassing written and visual elements, were strategically employed. Aligning with the specified learning outcomes, this distribution was meticulously balanced. Accordingly, 15 environmental prints featuring written and visual content were recurrently employed four times each, while five were repeated five times each. The environmental prints reiterated four times include: ÇİLEK, MİNİKA ÇOCUK, BABY TV, CARIOCA, PRITT, PONY, LOL, ETİ, UNI BABY, BABY MALL, FANTA, VARDEM, ALGIDA, LEGO, FATİH. Those reiterated five times: PINAR, JOKER, ADIM ADIM, CARS, TRT ÇOCUK. The rationale behind the strategic distribution of 20 environmental prints in the designed activities for this study is to achieve a balanced distribution of learning outcomes of the activities throughout all the sessions.

Within the scope of the prepared activities, 41 learning outcomes have been identified, including five outcomes for logographic reading, 18 for receptive skills, and 18 for expressive skills.

Table 3. 4. Learning Outcomes Used in Environmental Print Activities

A. LOGOGRAPHIC READING OUTCOMES
A.1. Reads logographically the actual product, including EP
A.2. Reads logographically the photograph of the actual product, including the EP
A.3. Reads logographically the EP (Graphic cues included: color, shape)
A.4. Reads logographically the photocopy version of the EP item without visual cues (black and white version of EP)
A.5. Reads logographically the manuscript version of the EP item
B. LANGUAGE SKILLS OUTCOMES
B.1. RECEPTIVE LANGUAGE **B.1.1.** Shows the color present in the environmental print. (e.g., black, green, pink)[1] **B.1.2.** Shows the shape present in the environmental print. (e.g., circle, heart, triangle)[2] **B.2. EXPRESSIVE LANGUAGE** **B.2.1.** Uses the name of the color present in the environmental print. (e.g., black, green, pink)[1] **B.2.2.** Uses the name of the color present in the environmental print. (e.g., circle, heart, triangle)[2]

[1] Additional colors include blue, white, orange, yellow, red, purple, and gray.

[2] Additional shapes include square, rectangle, oval, diamond, and star.

Table 3.4 demonstrates two main categories of learning outcomes associated with using environmental prints (EP): Logographic Reading Outcomes and Receptive, Expressive Skills Outcomes.

The logographic reading outcomes align with the five levels outlined in the logographic reading test, which progressively measures children's logographic reading skills. Each level represents a different engagement stage, from recognizing actual products to identifying more abstract representations of EP, such as black-and-white photocopies or manuscript versions. The rationale for aligning each outcome with a corresponding level of logographic skills is to ensure that all levels are addressed equally throughout the environmental print activities. This approach aims to provide children with balanced opportunities to contribute logographic reading skills uniformly across the different levels.

Language skills outcomes consist of receptive and expressive skills related to EP. These outcomes focus on specific colors and shapes used in the EP activities, ensuring children's interactions with the materials reflect their language development. In Receptive Language tasks, children demonstrate understanding by showing specific colors or shapes when prompted, such as identifying black or green colors or pointing to circle or triangle shapes present in the EP. In Expressive Language tasks, children actively use language to name these colors and shapes, for example, verbally identifying a color as yellow or a shape as a square. The colors (e.g., black, green, pink) and shapes (e.g., circle, heart, triangle) chosen for these tasks directly came from the EP materials utilized in the study.

In addition, these activities with EPs also incorporate the outcomes listed in the 2024 Preschool Education Program by the Ministry of National Education (MoNE). The outcomes addressed during the implementation process with the children are shown in Table 3.5.

As seen in Table 3.5, the activities designed utilizing Environmental Prints (EP) for the implementation process also include outcomes from the developmental fields of cognitive development, language development, social-emotional and values, and

physical development and health outlined in the Preschool Education Program (MoNE, 2024).

Table 3. 5. Learning Outcomes in MoNE (2024) Used in Environmental Print Activities

Developmental Fields	**Learning Outcomes in Preschool Education Program**
Cognitive Development	**K1:** Maintains attention towards an object/situation/event. **K2:** Describes the characteristics of objects/entities. **K3:** Demonstrates that they remember what they perceive. **K4:** Evaluate their predictions about objects/situations/events. **K6:** Recognize symbols used in daily life. **K7:** Organize objects/entities/events based on various characteristics. **K8:** Develop various patterns. **K9:** Demonstrates number awareness. **K10:** Demonstrates counting skills. **K16:** Recognizes geometric shapes. **K18:** Follows visual/verbal instructions related to the activity/task. **K19:** Makes an effort to complete an activity/task. **K20:** Produce solutions to problem situations.
Language Development	**K3:** Uses language for communication purposes. **K7:** Interprets the meaning of what they listen to/watch. **K8:** Create original products using visual materials. **K11:** Demonstrates reading awareness. **K12:** Demonstrates writing awareness. **K13:** Demonstrates pre-writing skills.
Physical Development and Health	**K3:** Performs coordinated movements using objects/tools. **K4:** Performs strength-demanding movements using gross motor skills. **K5:** Performs balance-requiring movements. **K6:** Performs coordinated movements using fine motor skills. **K8:** Performs manipulative movements using tools. **K10:** Moves in rhythm with music and rhythm.
Social-Emotional Development and Values	**K3:** Has self-confidence. **K4:** Shows determination to complete a task/assignment. **K15:** Follow rules in different environments.

In the domain of Cognitive Development, the activities focus on nurturing children's attentional, analytical, and cognitive skills. Notable outcomes such as ***K2:*** *Describe the characteristics of objects/entities* and ***K20:*** *Produce solutions to problem situations* highlighting the activities developing foundational cognitive abilities and complex problem-solving skills. These learning outcomes enhance children's ability to focus on and interact with their environment meaningfully.

In Language Development, activities include enhancing communication, comprehension, and expressive capabilities. Key learning outcomes like ***K7:*** *Interprets the meaning of what they listen to/watch* and ***K11:*** *Demonstrates reading awareness and* emphasizes the importance of auditory and visual processing skills. These are critical for developing early literacy and effective communication in various forms. For Physical Development and Health, learning outcomes are focused on physical coordination and rhythmic activities, as addressed by ***K4:*** *Performs strength-demanding movements using gross motor skills* and ***K10:*** *Moves in rhythm with music and rhythm.* These activities include the development of gross motor skills and musicality, contributing to overall physical health and the ability to participate effectively in group dynamics. For Social-Emotional Development and Values, activities were addressed through learning outcomes that promote personal expression and social responsibility. Examples include ***K4,*** *Shows determination to complete a task/assignment,* and ***K15,*** *Follows the rules in different environments,* which are significant in cultivating emotional intelligence and ethical responsibility among preschoolers. In conclusion, given that the activities cover various developmental fields, including learning outcomes specified in the Preschool Education Program (MoNE, 2024), there is an alignment between the designed activities and the program standards.

Table 3.6 below displays the activities undertaken during the implementation process, including the activity number, activity type, Environmental Prints (EPs) forms, and the colors and shapes involved.

Table 3. 6. List of Environmental Print Activities in the Implementation Process

Number of the Activity	The Activity Type	Forms of EPs and Concepts[3]
1.	Play integrated Language Activity	EPs Forms of A and C Black, Yellow, Purple, Square

[3] Within the framework of this learning process, activities with environmental prints have been systematically organized into distinct forms aligned with specific learning objectives. These forms are outlined: EPs Form A: Use of real products with logos, emblems, symbols, or brands. EPs Form B: Use of photographs of real products with logos, emblems, symbols, or brands. EPs Form C: Use the original (colored) version of logos, emblems, symbols, or brands on the products. EPs Form D: Use logos, emblems, symbols, or brands on the products in a detachable format. EPs Form E: Use black and white (colorless, photocopy) versions of logos, emblems, symbols, or brands on the products. EPs Form F: Using logos, emblems, symbols, or brands on the products in plain text format

Table 3.6. (continued)

2.	Play integrated Language Activity	EPs Forms of A and C Green, Red, Circle, Heart, Oval
3.	Play integrated Language Activity	EPs Forms of B and C Pink, Rectangle, Diamond, Star
4.	Play integrated Movement Activity	EPs Forms of B, C, and D Blue, White, Orange, Gray
5.	Play integrated Language Activity	EPs Forms of B, C, and D Black, Yellow, Circle, Triangle, Oval
6.	Play integrated Movement Activity	EPs Forms of B and C Green, Blue, Heart, Rectangle
7.	Play integrated Math Activity	EPs Forms of B, C, and E White, Orange, Gray, Square
8.	Play integrated Language Activity	EPs Forms of B, C, D, and E Pink, Red, Purple, Diamond, Star
9.	Play integrated Drama Activity	EPs Forms of B, C, E, and F Pink, Orange, Gray, Rectangular
10.	Play integrated Language Activity	EPs Forms of B, C, E, and F Green, Yellow, Circle, Diamond, Star
11.	Play integrated Movement Activity	EPs Forms of A, B, C, and E Black, Blue, White, Heart, Oval
12.	Play integrated Art Activity	EPs Forms of A, B, C, and E Red, Purple, Triangle, Square
13.	Play integrated Language Activity	EPs Forms of A, B, C, and E Blue, Gray, Circle, Triangle, Rectangular
14.	Play integrated Language Activity	EPs Forms of C and E White, Yellow, Heart, Rectangular, Triangle
15.	Play integrated Math Activity	EPs Forms of C, E, and F Black, Green, Square, Oval
16.	Play integrated Language Activity	EPs Forms of C, E, and F Pink, Orange, Heart, Diamond, Star
17.	Play integrated Movement Activity	EPs Forms of C, E, and F Pink, Purple, Square, Oval
18.	Play integrated Art Activity	EPs Forms of C, E, and F Red, Gray, Circle, Diamond, Star

Table 3.6. (continued)

19.	Play integrated Language Activity	EPs Forms of C, E, and F Black, Orange, Red, Purple
20.	Play integrated Math Activity	EPs Forms of C, E, and F Green, Blue, White, Yellow, Triangle

Table 3.6 lists 20 activities, predominantly play and language-integrated activities. The colors addressed in the process include pink, green, blue, red, black, purple, grey, white, orange, and yellow. Shapes include circles, squares, rectangles, triangles, stars, hearts, diamonds, and ovals. Each color and shape concept were addressed with equal frequency. To be more understandable, an example of an activity implemented in the process is presented in Table 3.7 below.

Developing activities involving environmental prints for preschool education involved an approach grounded in the relevant literature (Prior, Gerard, 2004; NRP, 2000; Cummins, 2006) and the principles of the National Early Childhood Education Program (MoNE, 2024). Initially, these activities were formulated under the guidance of my advisor to ensure they met specific criteria that aligned with the standards. These standards include providing activities that are developmentally appropriate for 48 to 54-month-old children, incorporate play-integrated activities, demonstrate practical applicability, and are designed to progress from simple to complex regarding logographic reading skills. Establishing these foundational criteria, the activities were presented to three experts in early literacy development and early childhood education. These experts focus on the importance of adopting a child-centered approach and integrating more play-based methods into some of the activities. They argued that such approaches are important for fostering engagement and learning among preschoolers by making the activities more interactive and enjoyable. Based on expert insights, modifications were made to the activities to be designed as child-centered to increase children's interest and curiosity and encourage active participation. To make the activities more interactive, the researcher added some tasks that required teamwork and collaboration among children. For example, a treasure hunt game where children worked in small groups to find hidden EPs around the classroom. With the help of this modification, the learning process is more dynamic and encourages social interaction and communication among the children.

Table 3. 7. An Example of an Activity

The Name of the Activity	**Environmental Prints Hat** Play integrated Language Activity
Learning Outcomes and Indicators	**A.3.** Reads logographically the EP (Graphic cues included: color, shape) **A.4.** Reads logographically the photocopy version of the EP item without visual cues (black and white version of EP) **B.1.5.** Shows the **white** color present in the environmental print. **B.2.5.** Uses the name of the **white** color present in the environmental print. **B.1.7.** Shows the **yellow** color present in the environmental print. **B.2.7.** Uses the name of the **yellow** color present in the environmental print. **B.1.12.** It shows the **heart** shape present in the environmental print. **B.2.12.** Uses the name of the **heart** shape present in the environmental print. **B.1.13.** Shows the **triangle** shape present in the environmental print. **B.2.13.** Uses the name of the **triangle** shape present in the environmental print. **B.1.15.** Shows the **rectangle** shape present in the environmental print. **B.2.15.** Uses the name of the **rectangle** shape present in the environmental print. **Cognitive Development:** **K.2. Describes the characteristics of objects/entities.** **Indicators:** States the names of objects/entities. Examines objects/entities. Describes the physical characteristics of objects/entities. Describes the functional characteristics of objects/entities. **K.3. Demonstrates that they remember what they perceive.** **Indicators:** States the object/situation/event again after some time. Identifies the object that was removed/added. **K.4. Evaluate their predictions about objects/situations/events.** **Indicators:** States their prediction. Explains the similarities/differences between their prediction and the actual situation. **K.6. Recognizes symbols used in daily life.** **Indicators:** States the meaning/function of the symbol shown. Shows the symbol that matches the explanation given. Asks for the meaning of unknown symbols. **K.16. Recognizes geometric shapes.** **Indicators**: States the name of the geometric shape shown. States the defining characteristics of geometric shapes. Shows objects with the mentioned geometric shape. **Language Development:** **K.7. Interprets the meaning of what they listen to/watch.** **Indicators:** Explains what they listened to/watched to others. Answers questions related to what they listened to/watched. **K.11. Demonstrates reading awareness.** **Indicators:** Talks about written materials found in the environment. **K.12. Demonstrates writing awareness.** **Indicators:** Points out the writing around them. **Physical Development and Health:** **K.3. Performs coordinated movements using objects/tools.** **Indicators:** Catches thrown objects. Throws objects at a target from a certain distance. **K.4. Performs strength-demanding movements using gross motor skills.** **Indicators:** Pushes objects/items. Pulls objects/items. Lifts objects/items.

Table 3.7. (continued)

Environmental Prints	
Materials	Environmental Prints form of C and E Hats made of origami (Equal number of children) Ball, Bags, Papers, Crayons, Copy Papers and Tapes
Concepts	White, Yellow, Heart, Triangle, Rectangle
LEARNING PROCESS	
The teacher invites the children to the circle. Each child is given a hat made of origami. These hats have the C forms of EPs. While the children put on their hats, the teacher asks questions to introduce each different EPs as they come up. After discussing each EP, the teacher brings a ball into the circle. They begin to play. In the play, one of the children in the circle steps forward, chooses one of the EPs on the hats and throws the ball up while calling out the name of the EP. The children whose hats include that EP try to catch the ball. The child who catches the ball has the chance to throw it next. It is completed in this manner. After playing, children with similar EPs come together in groups. Each group takes a bag containing puzzle pieces of their EPs (Form E) printed on A3 paper. As a group, children try to complete the puzzle. After that, the children have extra time to examine the other groups' puzzles by comparing the C form on their hats with the E form at each puzzle station. The teacher invites the children to the table. Each child has a sheet of A4 paper with one of the EPs (C form) to be discussed printed on it. Each sheet has a copy of paper attached to the corners with tape. The teacher asks, "*Who can see a triangle/heart/rectangular on their paper? If you see one, copy it with a pencil.*" They discuss shapes (triangle-heart-rectangular) found in the EPs. For awareness of the colors on the EPs, the teacher removes the copy papers from the children's sheets. The teacher asks the children to point out and name a color on their EP. Then, if a child says "*yellow, white,*" all the children look at their EPs, including those whose EP has white and white parts, with their fingers. Here, the teacher allows the chance to express themselves to all the children.	
ASSESSMENT	
The teacher invites the children to circle. The teacher calls a volunteer child and places a hat on his/ her head. After placing the hat, the teacher attaches the C and E Forms of one of the EPs addressed to the hat. All children except the volunteer child can see the EP on the hat. In the play, the child with the hat asks the other children questions to guess what the EP is. For example, "*Is it something edible? Is it something watchable? Is it playable? Does it have yellow in it? Is there a triangle in it?"* The other children can only answer yes or no. This way, the child with the hat tries to guess the EP on his/her head.	

Additionally, feedback was received from the experts who highlighted the need for more play-integrated activities, and revisions were made to the proposed activities. The experts suggested that incorporating play into the learning process would enhance engagement and foster more profound understanding and retention among

children. To respond effectively to this feedback, the structure and content of the activities with a focus on increasing play elements were reevaluated. The specific changes were made to integrate more play, for instance, in an activity redesigned around a grocery store theme, role-playing scenarios in the activity where children could assume characters that interact with the environmental prints in various contexts. Children would use EPs as products they could '*buy*' and *'sell,*' thus learning about different logos and symbols through a playful shopping game. Furthermore, more games like memory games and puzzles were integrated into the activities' content.

3.5.3. Research Context

In qualitative research, rich and detailed descriptions are essential to provide a comprehensive understanding of the study context. Merriam (2009) emphasizes the need for detailed descriptions that include words and pictures of the setting, participants, or phenomena. Similarly, Miles and Huberman (1994) highlight the importance of thick descriptions in understanding the situations and phenomena being studied. These detailed descriptions help define the study's boundaries and offer insights into how events unfold over time. Yin (2018) further supports this by stating that such descriptions, sourced from personal experiences, artifacts, and recollections, are significant for understanding causal relationships and comparing findings with existing literature.

The investigation by Neuman and Roskos (1993) focuses on the importance of children having multiple daily interactions with print to enhance their print knowledge and writing skills. Moreover, the prints children are exposed to daily are also considered essential for this study. Thus, these descriptions help accurately define the study context and establish the study's boundaries. Considering this, the classroom environment, including learning centers, was described in terms of prints. In this class, prints were only represented under colors, shapes, and number cards, explicitly labeling each with its corresponding name to facilitate print engagement, as illustrated in **Hata! Başvuru kaynağı bulunamadı.**. However, these color, shape, a nd number cards are exhibited on the wall, positioned above the child's eye level.

Figure 3. 3. Color and Number Cards in Class

Figure 3. 4. Shape Cards in Class

According to the Preschool Education Curriculum, preschools should have a block, book, music, art, science, and dramatic play centers. (MoNE, 2024). Due to the small classroom size, four learning centers were identified: block, book, music, and art. Notably, none of these centers contained any form of written labels or prints,

including the centers' names, which were not displayed in writing, as demonstrated in Figure 3.4.

Figure 3. 5. Learning Center in Class

The literacy center had a carpet on the floor featuring English alphabet letters. Apart from these letters, none were displayed anywhere else in the classroom, as displayed in Figure 3.5. Each child in the art learning center had a box containing art supplies such as crayons, brushes, and glue designated for use. The boxes were personalized with the children's photos attached, yet, similarly to other centers, the children's names were not written on them.

Learning centers, described as activity centers, are systems employed to structure a classroom or its materials (Jackman, Beaver, Wyatt, 2014). These centers enhance learning by providing a range of tasks and activities that enable children to progress and learn at their individual pace. Simultaneously, these setups allow them to apply and practice their existing knowledge (King-Sears, 2007).

According to the Preschool Curriculum in Türkiye (MoNE, 2024), teachers should design and clearly label different centers such as block centers, art stations, and music areas. Moreover, they should ensure that each area is equipped with relevant print materials accessible and readable by children, promoting print awareness. It is also supported by the investigation by (Tadjic, Martinec, and Farago, 2017), in which scholars emphasize the importance of organizing various materials in learning centers and facilitating children's access to them. It is argued that these materials should include written items that attract children's attention and encourage them to engage in various activities. Additionally, it is underlined that writing the names of the learning centers helps children recognize and utilize these areas. Therefore, when examining the classroom where the activities took place regarding print awareness and recognizing environmental prints, it can be said that it was not designed to support children.

3.6. Instruments

In the current study, the Demographic Information Form, Information Form on the Frequency of Interaction between the Environmental Print and Child, Logographic Reading Test, Observations, Semi-Structured Interviews, and Basic Concept Knowledge Checklist were utilized as instruments.

3.6.1. Demographic Information Form

The demographic information form was developed to acquire detailed information about each child and their mother and to explain the status of crucial variables related to the research topic, emergent literacy. Demographic information form was developed explicitly for the current study in alignment with pertinent literature. One of the components of the form was socioeconomic status (SES). Socioeconomic status plays a significant role in emergent literacy investigations, as the impact of environmental print on children's emergent literacy knowledge can vary based on their SES (Prior, 2003). Additionally, the literacy literature underscores the importance of specific indicators such as family socioeconomic status (Perkins, Finegood, and Swain, 2013; Taner, Basal, 2005; Hamilton, Hayiou-Thomas, Hulme,

and Snowling, 2016), mother's occupation (Bayraktar, 2018), mother's educational level (Bracken and Fischel, 2008, Bayraktar, 2018), primary-secondary languages spoken in the home (Dickinson and MacCabe, 2001; Waldfogel, 2012) as common indicators frequently employed in emergent literacy studies to illustrate children's SES. Furthermore, certain variables play an important role in emergent literacy research, particularly in print awareness. These include the child's age, as discussed by Van Tonder et al. (2019), a child's gender as examined by Coşkun (2023), and duration of school experience, a factor explored by Kaunda (2019).

Given this perspective, the form comprises seven primary indicators: parents' ages, educational levels, and occupations; children's age and gender; and their previous school experiences. Additionally, primary-secondary languages spoken at the participants' homes are also considered.

3.6.2. Information Form on the Frequency of Interaction between Environmental Print and Child

Information Form on the Frequency of Interaction between Environmental Print and Child was developed by considering previous investigations on environmental print and print awareness (Neumann, 2014; Neumann, Hood, and Ford, 2013). The primary objective in preparing this form is to indicate the frequency of the child's engagement with the environmental prints preceding the commencement of the study. It aims to gather informative data concerning the frequency of these interactions, providing valuable insights into the child's pre-existing experiences with environmental prints. This form is prepared in this framework to demonstrate the frequency of a child's interaction with various visual stimuli, environmental prints, and logographic reading skills. The initial inquiry is directed towards gauging the frequency with which the child is exposed to environmental prints, such as restaurant names or street signs, and the extent to which discussions are held regarding these prints. The second question displays the frequency of the child's interest in adult reading materials, providing insights into their engagement with materials such as newspapers and magazines. The third question indicates the frequency of the child soliciting assistance from the mother in reading words on street signs or food

packages. The fourth question portrays the frequency of the child's ability to recognize words in their environment and prompts them to specify which words they recognize. The fifth question expresses the frequency of the child's logographic reading skills concerning words encountered, prompting them to specify commonly recognized words. Through the data obtained from this form, explanations of thick descriptions for each child were also used.

The detailed revision process based on expert opinions on the "*Information Form on the Frequency of Interaction between Environmental Print and Child*" was as follows. First, the form was prepared following the purpose of this study, which was in line with the empirical investigations on the topic of environmental print from the related literature. When three early childhood education experts examined the form, they suggested restructuring the questions to include various environmental print items for interaction. In line with the suggestions, the form was revised to cover various environmental print interactions and to be comprehensible.

Understanding was achieved by simplifying the language of the questions and providing examples within the questions to guide responses. In addition, experts adviced expanding the form to cover more settings and types of environmental print that children may be exposed to, beyond just examples such as restaurant names or street signs, and redesigning the frequency categories to reflect the regularities of interaction with environmental print. Adjustments were then made to ensure that the questions effectively differentiated between frequency levels of interaction with environmental print.

Regarding the frequency categories, each category was reorganized to reflect different levels of environmental print-child interactions. '*Never*' shows no interaction with environmental prints, '*Rarely*' implies rare interactions, '*Once a Week*' indicates regular but less frequent interactions, '*Once a Day*' suggests daily interactions, and '*Several Times a Day*' represents the most frequent interactions. After incorporating these modifications, experts again reviewed the form and approved it to be compatible with the research objectives.

3.6.3. Logographic Reading Test

No standardized instrument exists for assessing children's logographic reading tests (Nutbrown and Hannon, 1993; Whitehurst and Lonigan, 1998). The absence of a standardized instrument stems from the fact that to evaluate a child's logographic reading skills, the environmental print (EP) items composing the measure must be taken from the child's environment. Therefore, researchers who conducted their investigations concerning children's logographic reading skills have created an instrument tailored to the scope and objectives of their study (Berry, 2000). Although the logographic reading tests to assess children's logographic reading skills vary, the method of measuring this knowledge is common. Typically, a child is shown a picture of an object containing EP and is asked to state what the EP on the object says. These instruments differ in the following areas: (a) types of EP items included, (b) selection process of the EP items, (c) presentation of the EP items, (d) task administration, and (e) response scoring (Berry, 2000).

For the current study, the types of Environmental Print (EP) items initially consist of child-related EP items and, to a lesser extent, community EP items, categorized as such by Horner (2005). A pool has been created using numerous child-related EP items. These EP items have been reviewed again to serve another goal of this study: to explore children's receptive and expressive skills on colors and shapes with the help of environmental print. Various colors and shapes were introduced to the items to achieve this goal. However, limiting the selection to child-related EP items did not result in the desired diversity.

Consequently, community-related EP items were also included. This addition has ensured that the selected EP items are tailored to fit the scope of the current study. More detailed information can be found in section 3.6.1, "*The Process of Selection of Environmental Print Items.*"

Logographic reading tests vary regarding how the EP items are presented (Berry, 2000). In some tests, children were indicated environmental print in only one context (e.g., 3D items with EP, pictures of signs, logos from objects); other scholars

preferred to display each EP item in two or more phases, each representing a different level of logographic reading skills (Goodall, 1984; Goodman and Altwerger, 1981; Hiebert, 1978; Kuby et al., 1994; Masonheimer et al., 1984; Stahl and Murray, 1994). This study utilized an expanded version of the logographic reading test developed by Kuby, Alridge, and Snyder (1994), which assesses children's ability to recognize environmental print (EP) through varying levels of contextual support. The test consists of six phases: presenting the actual product with EP, showing a photograph of the product, displaying a black-and-white photocopy of the EP item, presenting only the EP item, and showing the typed version. The sixth phase, which involves embedding the EP item in a simple sentence as a manuscript version, was excluded from this study due to its emphasis on formal reading instruction, which does not align with the current research objectives. The primary reason for this exclusion is the educational approach outlined in the Ministry of National Education (MONE) program (2024) in Türkiye. Although the program emphasizes the support of early literacy skills, it does not include direct instruction in reading and writing. Instead, the focus is on providing experiences that indirectly foster the development of reading and writing skills in young children. Since Kuby's sixth level requires children to engage with print within a sentence structure, which closely resembles formal reading instruction, it contradicts the principles of the MONE program (2024). Therefore, it was not included in this study.

In contrast, this study adopted a five-level approach to assess children's ability to recognize environmental print in various forms with decreasing contextual support. The fifth level involves presenting the printed form of the EP item, aiming to evaluate children's ability to recognize print in a more abstract and decontextualized format. This approach offers more detailed insights into children's logographic reading skills and their ability to understand environmental print as they move from contextually rich representations to more isolated print forms. The five-level model allows for observing children's performance at different stages, identifying where they struggle or succeed in recognizing environmental print.

In this study, EPs have been represented in five different versions. These are as follows: children are *(Level 1)* demonstrating the actual product with EP, *(Level 2)*

displaying a photo of the original product with EP, *(Level 3)* indicating the original (colored) version of EP, *(Level 4*) presenting photocopy version of EP (black and white without additional cues), and *(Level 5)* revealing only the printed form of the word of EP. The versions of environmental prints are illustrated in Table 3.8.

Table 3. 8. Versions of Environmental Prints

				
Level 1 Actual product with logo	**Level 2** A photo of the original product with the logo	**Level 3** The original (colored) version of the logo	**Level 4** Photocopy version of the logo (black and white without additional cues)	**Level 5** The printed form of the word logo

EP items corresponding to each level were presented when administering and scoring responses in the logographic reading test. Children were asked, "What does this say?" for each item. The scoring system assigned 2 points for correct answers, 1 for meaningful responses (e.g., interpreting "PINAR" as a beverage), and 0 for the absence of a response or incorrect answers. A total of 20 environmental print items were included in the logographic reading test.

In this test, the images representing EPs were presented on cards of equal size, each with the dimensions of an A4 paper. The dimensions of A4 paper are 21 cm in width and 29.7 cm in height. All cards used in the test were the same size. Additionally, all written forms *(Level 5)* of environmental prints in the logographic test formatted using '*Times New Roman'* font.

The logographic reading test was administered individually to each child during the two weeks before the implementation process. It was conducted in a quiet room, and verbal consent was obtained from each child before the beginning of the logographic test. Although the test duration varied from child to child, it averaged about 15 minutes. In the post-test, the average time of administration was approximately 25 minutes.

In the process of developing the logographic reading test, expert opinions on early childhood education were taken. Their feedback was critical in refining the test design, particularly regarding the appropriateness of the selected environmental print (EP) items, the presentation format, and the overall structure of the assessment. The expert review process involved several stages. Initially, a draft version of the logographic test was presented to provide detailed feedback on the types of EP items regarding the selection criteria and the visual clarity of the materials. The experts emphasized the importance of ensuring that the EP items were culturally relevant and reflective of the children's everyday environments, aligning with the findings of Berry (2000) and Horner (2005) on the necessity of contextually appropriate EP materials.

Additionally, the experts recommended modifications to the logographic test presentation, suggesting that the EP items be displayed in a sequence that progressively increases contextual support, as utilized in previous studies (e.g., Kuby et al., 1994). The experts also reviewed the scoring system, supporting a multi-tiered approach that awarded points based on the children's responses' accuracy and relevance. Their recommendations were instrumental in refining the test's scoring criteria better to capture the details of children's logographic reading skills. For example, they advised that meaningful interpretations of EP items, even if not entirely accurate, should be acknowledged to account for the developmental stages of early literacy. (e.g., saying "*milk*" when seeing the "*Pınar*" logo). The logographic reading test was revised to incorporate their feedback after the expert review. Thus, the expert consultations contributed significantly to refining the logographic reading test, enhancing its potential to accurately assess children's ability to recognize and understand environmental print.

The logographic reading test was piloted to define the effectiveness of environmental print materials (EPs) in assessing children's logographic reading skills. The pilot study involved a small group of preschool children (N_C=2). The data obtained from these children were excluded from the main study. The focus of the piloting of the tests was to observe how well the children could recognize and understand the EPs, like logos and symbols presented to them, ensuring the test's settings and materials were suitable for their age. In addition, it is aimed at measuring the intended outcomes without any external influence on the children's performance. Based on the findings from the pilot study, the test kit was redesigned. The primary reason for this redesign was to address an issue observed during the test administration. During the test, the children were first presented with the most challenging level, which involved showing the printed version of the logo *(Level 5).* This process was followed by the black-and-white version of the same logo and the colored version *(Level 4),* progressing from the most difficult to the easiest level. Since these pages were presented sequentially, using thinner paper allowed the children to see through to the following page, potentially giving them visual cues and enabling them to answer the more difficult level questions even if they did not fully understand them. To prevent this, the test materials were printed on thicker paper, ensuring that each level could be assessed independently. These adjustments were made to align the test with the research objectives better and enhance the clarity and effectiveness of the logographic reading test.

3.6.4. Observations

Observation as a research method is distinctive, providing firsthand data on a phenomenon independent of the participant's perspective. It proves advantageous for documenting behavior, whether occurring or absent, in natural settings. Notably, observation is the most suitable technique when the researcher's goal is to scrutinize an activity, event, or situation (Merriam, 2009). These inherent qualities contribute to researchers' preference for observation techniques, particularly when employed systematically to elucidate research questions. Investigators often create checklists tailored to address specific questions, ensuring reliable results (Merriam, 2009).

Therefore, the present study used observation to scrutinize the participating children during free-play time and investigate their interactions with environmental prints in natural play settings. An observation form was developed encompassing emergent literacy indicators drawn from pertinent literature (Sinclair and Golan, 2002; Adams, 1990; Snow et al., 1998). In line with these empirical findings, sample rubrics were prepared. My advisor of the researcher meticulously reviewed these sample rubrics. Afterward, the observation rubric was redesigned to determine whether the child outcomes to be investigated in the implementation process were demonstrated during free play time and whether these outcomes were related to logographic reading and receptive, expressive skills on basic colors and shapes. Next, three experts who specialized in early literacy development and early childhood education reviewed the prepared observation rubric. This preliminary feedback ensures the rubric comprehensively covers the desired logographic reading and receptive, expressive skills on color and shape indicators appropriate for the age group studied. According to the feedback from field experts, the final version of the rubric has been established.

The pilot study was conducted at the preschool where the current study would take place, but in a different classroom, two weeks before the beginning of the study. In this class, the prepared learning center with Environmental Print (EP) was observed for three days, with each observation session lasting 30 minutes and three sessions. As a result of these observations, the non-participant researcher identified several aspects of the process that needed improvement to be more effective. To begin with, the researcher realized that it was not feasible to observe all the children arriving at the EP learning center simultaneously on her own, based on the predetermined criteria in the observation rubric. To address this, the researcher identified an area for a video camera that could capture all the children who are playing in the learning center. Analyses were conducted by recording with the camera and focusing on each child during video reviews. Next, it is recognized that the researcher's presence affected the children’s natural behavior. To solve this problem, the researcher decided to become familiar with them before the current study began. In other words, the researcher spent time in the class at regular intervals for two weeks before the start of the process.

There are two primary reasons for conducting observations in this study. The first one is to investigate whether there is a change in children's levels of logographic reading and receptive, expressive skills on basic colors and shapes because of the educational use of environmental print stimuli containing text and visuals within the scope of the research question. During the process, children's play preferences with environmental print stimuli containing text and visuals were determined in terms of the duration of play. The time each child spends in this learning center was identified. The information obtained in this context was analyzed to determine whether there was a change in children's outcomes in the implementation process. The second one is that in the prepared learning center, children's logographic reading and receptive, expressive skills on colors and shapes dimensions were addressed in an environmental print containing text and visuals.

The observation data collected were synthesized with the findings obtained from interviews with mothers and teacher and the results from the logographic reading tests collected from children and checklists. In this context, the observation data enriched the overall analysis by providing insights into the following areas: *(i)* weekly participation in the environmental print (EP) learning center, *(ii)* weekly distribution of logographic reading skills by level, *(iii)* weekly distribution of receptive and expressive language skills regarding color and shape concept knowledge, *(iv)* the distribution of children's preference for the EP learning center during free play time by gender, (*v)* average time spent (minutes) in the environmental print learning center by gender, and *(vi)* the number of children whose language skills were observed in terms of gender. These data points contributed to a comprehensive understanding of children's emergent literacy development across multiple dimensions within the study.

The Learning Center with Environmental Print prepared by the researcher was recorded for 30 minutes during free playtime once a week for ten weeks. The observation records were analyzed for each child individually through the *'Observation Rubric.'* With the help of the *"Observation Rubric',* the researcher aimed to capture information about a child's logographic reading and receptive, expressive skills on colors and shapes. It includes details such as the child's name,

age, gender, date, duration in the learning center, and the total number of environmental prints in a classroom environment. For observation, a designated corner was established in the classroom to serve as a learning center during the implementation period. This learning center featured regularly updated environmental prints used in weekly activities, and children's progress was systematically monitored with the help of observation rubrics. All observation sessions were recorded using videotapes.

3.6.4.1. Learning Center with Environmental Prints

Learning centers, or learning areas, interest centers, or activity centers, are defined as a system used to organize a classroom or materials in a class for instructional purposes and as a teaching method utilized for motivation (Jackman, Beaver, and Wyatt, 2014). Learning centers allow children to work and learn at their own pace, maximizing learning through various tasks and activities that permit the application of their prior knowledge (King-Sears, 2007). Kostelnik, Soderman, Whiren, and Rupiper (2015) emphasized that creating learning centers in educational environments meets individual learning needs and facilitates meaningful learning experiences. Considering this information, the learning center prepared within the scope of the study is determined based on research questions and criteria from relevant literature. These criteria are gender preferences, safety, health, utility, and authenticity.

Gender Preferences: In alignment with research on play preferences among preschool children, it was identified that girls exhibit a heightened inclination towards symbolic play, whereas boys tend to favor constructive play (Gmitrova, Podhajecká and Gmitrov, 2009). In light of these findings, the learning center design was strategically arranged to cater to girls' engagement in symbolic play. This involved incorporating items such as a toy kitchen, a toy shopping cart, and environmental prints (authentic product forms featuring logos and emblems) intended for application within the defined concept. At the same time, for boys, the environmental prints were meticulously crafted to complement participation in construction games. Specifically, these prints were affixed to large Lego pieces and

arranged in smaller segments, allowing children to assemble them and recreate the logos associated with the environmental prints.

Additionally, environmental prints containing text and visuals, employing a puzzle or find-and-match concept for integration into activities during the implementation, were thoughtfully included. Refraining from enriching the existing socio-drama and construction play centers in the classroom with environmental prints ensures that the child selects that learning center based solely on the presence of environmental prints. In this regard, one week before the study, toys without environmental prints were introduced into the classroom, allowing children time to play and explore with these toys. Throughout the implementation process, environmental prints designated for the activities were systematically introduced into this learning center every week. The learning center's content updates weekly, incorporating the environmental prints in focus to maintain its dynamism.

Safety and Health: In the existing literature, Neuman and Roskos (1997), who have conducted extensive research on environmental prints, have emphasized the importance of ensuring that such materials, when incorporated into an educational environment, do not threaten children's safety and health. They advocate for the inclusion of utility and authenticity in these materials. Environmental prints were incorporated into this learning center while ensuring the absence of any threat to the child's health or safety. Within this framework, real products featuring environmental prints, as addressed in Form A *(Utilizing real products with logos, emblems, symbols, or brands)*, avoided using materials like easily breakable glass or tin that could pose a hazard to children. Environmental prints utilized in other forms were crafted without sharp corners, employing materials such as cardboard and wood.

Utility: Form B (*Utilizing photographs of real products with logos, emblems, symbols, or brands*), form C (*Utilizing the original-colored photograph of logos, emblems, symbols, or brands on the product*), form D (*Utilizing logos, emblems, symbols, or brands in a removable format on the product*), form E (*Utilizing the black-and-white photograph of logos, emblems, symbols, or brands on the product*) and form F (*Utilizing the printed form of the word logo*) of environmental prints, to

be featured in the activities, was approached in a manner conducive to fostering children's individual and small group activities, thereby promoting their play, and learning endeavors.

Authenticity: Real products featuring logos, emblems, symbols, or brands, as outlined in Form A, were also incorporated into the environmental prints to be featured in the activities. The inclusion of actual products from children's everyday environments was designed to provide a learning experience, reinforcing the connection between what children encounter in their daily lives and the structured learning activities in the center.

The learning center with environmental prints was designed based on research and literature, focusing on criteria such as gender preferences, healthy, safety, utility, and authenticity. The center was tailored to support boys' and girls' play preferences, incorporating symbolic and constructive play materials. Real products with logos and symbols created a meaningful learning experience, reinforcing the connection between children's everyday encounters and activities. Safety and children's health were considered by avoiding hazardous materials, and various forms of environmental prints were introduced to facilitate individual and group activities. The learning center's content was updated weekly to maintain dynamism and encourage continuous exploration.

3.6.5. Semi-structured Interviews

Semi-interviews conducted with the mothers and the classroom teacher are detailed below under three separate subheadings. These subheadings include the pilot study, semi-structured interviews (pre- and post-) with the mothers, and semi-structured interviews (pre- and post-) with the teacher.

These interviews were conducted in a quiet room to facilitate focused discussions, and the data was systematically recorded using an audio recorder. Each interview was initiated following a standardized protocol, which involved restating the information outlined in the fact sheet and securing participants' consent for recording

the interview to facilitate subsequent transcription and coding. The interviews, with an average duration of approximately 30-35 minutes, were accompanied by the researcher taking notes. The researcher aims explicitly to extract mothers' and class teachers' perspectives. To ensure comprehensive responses, "*probe questions*" such as (i) "*Can you tell me more?"* (ii) "*Can you be more specific?*" and (iii) "*Can you share an example?"* were employed as needed. The use of open-ended interview questions aimed to guide discussions, encouraging teachers and mothers to provide detailed insights.

The interview protocol is typically categorized into structured, unstructured, and semi-structured. Semi-structured interviews prove particularly advantageous in case studies as researchers employ predetermined follow-up questions to extract specific and in-depth information from the interviewees. This approach allows interviewees the flexibility to express themselves openly (Hancock, Algozzine, 2006). This study conducted semi-structured interviews with mothers and teacher to gather comprehensive and in-depth insights into the children's outcomes.

The questions in the mothers and teacher interview form are underpinned by rationales rooted in relevant literature and theoretical frameworks. The questions in this form are specifically designed to explore whether children engage with environmental print in the school setting (with the help of pre-post teacher interviews) and at home (with the help of pre-post mother interviews) in everyday life, thereby exploring their current levels of logographic reading and receptive and expressive skills on colors and shapes. In this context, the prepared questions align with Vygotsky's sociocultural theory, which posits that children learn through social interaction within their cultural context (Vygotsky, 1978). Mothers and classroom teacher were interviewed regarding their children's logographic reading skills and reactions to different versions of EP in various contexts. In addition to this, questions related to the identification of EPs, like logos in different forms (the versions of color, black and white, plain text), are grounded in Piaget's Cognitive Developmental Theory (1962), suggesting that children's ability to recognize and differentiate symbols is a crucial cognitive skill that supports emergent literacy development.

Questions concerning the recognition of EPs, like logos or symbols from various versions such as television and magazines, are formulated based on literature highlighting environmental print's significant role. With the help of these questions, mothers and teacher can express children's familiar EPs and their interactions. This fundamental concept is detailed in Neumann's investigation (2012), which explains how children interact with environmental print in their environments from a young age and how this facilitates the transition from logographic to alphabetic reading stages. The study of Justice and Pullen (2003) emphasizes the importance of environmental print in providing meaningful literacy experiences vital for early reading development. Additionally, Kassow's study (2006) presents in-depth information on the cognitive processes involved in children's interpretation of environmental print. It demonstrates the depth of learning when children engage with environmental print materials in everyday contexts. Based on this literature, the questions are designed to understand better children's interactions with environmental print and its effects on pre-determined outcomes in children's emergent literacy development.

The formulation of interview questions needed a rigorous application of critical thinking and analysis to align with the focus of the research study. This involved developing a research instrument that effectively elicits the required data pertinent to the research focus. In the initial phase of preparing questions for effective review, the study was contextualized, and a set of research questions was devised to guide the inquiry. The interview questions with mothers and teacher were categorized under relevant subsections aligned with the primary research questions. First, consultation and revision discussions were undertaken by my advisor. Following the review, some follow-up questions were incorporated to explore deeper information about the children's emergent literacy skills, and some questions that did not serve the research purpose were excluded. Next, early childhood education experts evaluated the questions' validity and clarity. They also reviewed whether the questions adequately cover the depth and scope necessary to understand the impact of EP on children's emergent literacy skills. Following the expert suggestions, several modifications were made to the interview protocols to strengthen their effectiveness. For instance, instead of using the term "*environmental print,"* it has been adviced that descriptions

of this term be used in the questions and supported with visuals when asking the questions. In this context, the term "*environmental print*" has not been used in the interview questions with mothers, and modifications have been made in line with the suggested changes. This process ensures that the questions are understandable, more effective, and meet the intended criteria. Additionally, an alternative question was prepared for each question in the interview.

The purpose of designing suitable alternative questions for each was to ensure that if participants found the original questions challenging or needed more time to think, they would have a more transparent way of understanding and responding. For example, these alternative questions are designed to display deeper reflection and understanding from the participants, effectively gathering more detailed and meaningful data on how children interact with environmental prints regarding logographic reading skills in their everyday contexts. For instance, "*You are having breakfast in the kitchen with your child, and on a kitchen counter, there is a carton of your child's favorite drink, milk. When your child sees this milk carton, does s/he recognize the logo on it? What does s/he say about it? Beverage, milk, or the name of the logo?*". Finally, probe questions were added to the prepared questions based on the expert opinions to enrich the information. Probing questions asked mothers and teacher to describe specific instances where children interacted with environmental print and to discuss the outcomes of these interactions. The study's methodology has been significantly enhanced by incorporating expert recommendations into the interview protocols. As Creswell (2014) proposes, the validity of a study is influenced by the researcher's perception of validity and choice of paradigm assumptions.

3.6.5.1. Pilot Study

After incorporating revisions based on the opinions of early childhood education experts, a pilot study was conducted. The pilot study was crucial for checking the practical application of the interview protocols and making essential adjustments before the main study started. This process helped to ensure that the questions were

well-understood and effectively captured the desired information, ultimately contributing to the study's credibility and reliability.

Before the main study, the researcher conducted a pilot study involving children, their mothers, and the teacher. The findings from this pilot study were not included in the main study. The pilot study involved preschool children aged 48 to 54 months (N_C =2), their mothers (N_M=2), and one class teacher (N_T=1). Before the initiation of the pilot study, individual meetings were scheduled with each mother and teacher to facilitate one-on-one interviews. Consent forms were presented to participating mothers and the teacher, and their voluntary agreement to participate in the study was obtained. During the data collection procedure, interviews were conducted at a silent and convenient place, and all of them were audio recorded. Next, the interview process for the pilot study involved transcribing the discussions and analyzing the participants' responses to assess the questions' effectiveness. This analysis highlighted points where the interview protocol could be improved and integrated probing questions into some sections of the interview to enhance the depth and detail of the responses.

Consequently, the scope of questions for both mothers and teacher was expanded for the main study, ensuring a broader and richer data collection. The addition of probing questions enriched the content and enabled the researcher to practice and improve her skills in eliciting detailed and substantial responses. The experiences gained from the pilot study were instrumental in enhancing the researcher’s interviewing techniques. This preparation during the pilot phase was critical, as it provided the researcher with valuable insights into effectively guiding conversations to gather comprehensive and meaningful data for the main study. The pilot study thus served as important training for enhancing the researcher's ability to manage and adapt the interview process.

3.6.5.2. Semi-structured Interviews (Pre- and Post-) with the Mothers

The interview form includes a total of 13 semi-structured questions to capture both children’s pre-existing knowledge and changes resulting from implementation

focused on logographic reading and receptive, expressive skills on colors and shapes. The form begins with warm-up questions introducing the interviewee and gathering preliminary information about the child's general health and initial interests regarding emergent literacy. These questions include the child's background, chronic health conditions, emergent literacy knowledge, and interest in written materials, logos, and symbols.

The first segment of the main interview questions (Questions 1-5) focuses on the child's ability to recognize logos, symbols, and emblems in various contexts. These questions are designed to explore the child's logographic reading skills by asking if they can identify and understand original products with their environmental prints. For example: "*Does your child recognize the product when seeing the PINAR logo on a milk carton, understanding it's a drink or milk*?" and "*Can your child identify the PINAR logo when it's presented in a magazine or newspaper advertisement?*". The subsequent four questions (Questions 6-9) delve into how the child discusses and understands colors and shapes within logos and symbols during their interactions, indicating their receptive, expressive skills on colors and shapes. For instance, "*When discussing the colors in logos and symbols, can your child correctly show the color green if asked while looking at the PINAR logo*?" and "*During play, have you ever noticed your child discussing the shapes found in logos, such as discussing a triangle seen in a logo during the play?*".

After the mothers' pre-interviews, environmental print (EP) activities were implemented with the children. After this process, post-interviews were conducted with the mothers, during which the same questions from the pre-interviews were revisited, along with the inclusion of four additional questions for further exploration. The additional four questions (Questions 10-13) were added in the post-interview to explore any changes in the child's interaction with environmental print at home after the implementation. These questions are intended to determine if there is an observable change in how children talk about or inquire about EP, like logos, symbols, and emblems, mainly focusing on specific features such as colors and shapes. For example, questions such as the following asked: "*Have you noticed any changes in your child's behavior towards logos and symbols after participating in*

the implementation?" and "*Are there any new logos, symbols, or emblems your child has learned about through the implementation?*". Probe questions were added to the post-interview form used with mothers to enhance the depth of data. For example, questions like "*Could you briefly talk about your experience with this?*" have been asked. These types of questions are designed to encourage mothers to provide more detailed responses, elaborate on their initial answers, and provide insights into the children's interactions with environmental prints like logos and symbols. Furthermore, using probe questions facilitates a better understanding of the specific impacts of environmental stimuli on the children's logographic reading skills and basic concept knowledge, allowing for a more comprehensive analysis of developmental changes and influences.

3.6.5.3. Semi-Structured Interviews (Pre- and Post-) with The Teacher

This form contains a total of 22 questions designed to demonstrate both children's pre-existing knowledge and possible changes in their logographic reading and receptive, expressive skills on colors and shapes after participating in the implementation process. The form begins with warm-up questions to gather personal information about the teachers' professional experience and education level. This section sets the initial stage for deeper investigation and contextualizing the responses concerning the teachers' educational background.

The first set of four questions (from 1 to 4) aims to broadly understand teachers' thoughts on emergent literacy and teachers' conceptual understanding of the term *environmental print* (EP). These questions are designed to explore when and how children start recognizing written and visual cues and EPs in their surroundings, whether this awareness is self-initiated or facilitated by adults, and how the EPs can be effectively utilized in educational settings. Moreover, the intent is to demonstrate teachers' insights on integrating EPs like logos, symbols, and emblems into learning environments to support children's developmental areas, such as cognitive and language. This line of questioning is foundational for exploring educational approaches to emergent literacy in the context of everyday environmental interactions in classroom settings. For example, "*In your opinion, how can EPs like*

logos and symbols be used for educational purposes in a classroom setting? Have you previously incorporated these EPs in your practices? If not, how do you think they could be utilized for educational purposes?".

The second set of questions (from 5 to 9) explores teachers' observations of children's logographic reading skills in educational settings. These questions intend to display how well children recognize and identify EPs like logos, symbols, and emblems in various contexts, such as in original products with EP, photographs of original products with EP, manuscripts form of EP, or different formats. For instance, "*Can children in your classroom identify names of products that contain EPs like logos, symbols, or emblems? (e.g., recognizing a milk carton with the PINAR logo as a beverage milk or directly calling it PINAR).*

The third set of questions (from 10 to 14) seeks to identify the teacher's observations concerning children's recognition and understanding of colors and shapes within EPs, such as logos, symbols, and emblems in their environment. These questions explore how children can identify specific colors and shapes within these visual stimuli and whether they discuss these features during interactions with peers. With the help of these questions, the process of children's perceptual and cognitive processing of environmental prints aims to be presented. For example, questions like "*When you talk to children in your class about the colors in logos, symbols, or emblems, can they point to a specific color…can they show you a specific color in the logo if you ask them? (For example, when looking at the PINAR logo, if you ask them to show the green color, can they correctly show green? If so, have you had such an experience before? Can you briefly describe this experience? Who was involved?"* have been asked.

The teacher was subsequently interviewed post-interview, during which the same questions from the pre-interview were revisited, with the addition of four new questions that were examined in greater depth. The final set of questions (from 15 to 18) was prepared to indicate whether there has been any observable change in children following their participation in the set of activities with EP, as perceived by the teacher. The purpose is to understand if children show increased logographic

reading skills and if they can now better identify specific features like colors and shapes. Each question targets specific aspects of this change. Based on these purposes, a general change in awareness of EPs, logographic reading skills, the usage of EPs in terms of receptive, expressive skills, and newly recognized EPs after the implementation process were questioned. In this context, the following example questions: "*Have you noticed any change in children's awareness of EPs like logos, symbols, and emblems following the activities with EPs? (Do they now ask more questions or show more knowledge about simple features like colors and shapes?)*". Furthermore, "*After the implementation process, are there any new EPs like logos, symbols, or emblems that children have learned to recognize? If so, which environmental prints do you think children have learned?*" asked the teacher in the post-interview.

3.6.6. Basic Concept Knowledge Checklist

The rationale behind preparing this checklist is to investigate potential disparities in children's receptive and expressive skills on colors and shapes, both before and after the implementation phase. The "*Receptive Language*" dimension involves pointing to the object when its name is mentioned, while the "*Expressive Language"* dimension entails using the name of the concept (Bracken, 2006).

The checklist is designed to explore a comprehensive array of foundational conceptual knowledge, encompassing the recognition of colors and shapes within 20 environmental prints slated for consideration during the implementation. In other words, it is designed to evaluate a child's comprehension of basic concepts related to usage in the categories of color and shape with the help of receptive and expressive language skills. The child's proficiency was assessed as "*knows,"* "*does not know,"* or "*not observed*" based on their responses by the preschool teacher. Dimensions include understanding the concept by covering various colors and shapes using receptive and expressive skills.

As mentioned, the Basic Concept Knowledge Checklist was designed in line with the typical colors and shapes found in the environmental prints utilized during

implementation. In this checklist, the primary objective was to reveal receptive and expressive skills for each color and shape for each child participating in the study. Accordingly, the class teacher completed the checklists.

Three early childhood education experts reviewed the checklist and provided various feedback. The experts suggested that the definitions of receptive and expressive skills should be clarified and restructured to make the checklist more understandable and fillable. The definitions were added to each checklist and made explicit. To ensure practical usability, a pilot study was conducted with two teachers. The data collected from the teachers were not included in the main study. In the pilot study, difficulties experienced by the teachers while filling out the form were identified. The form was redesigned and revised based on the feedback provided. The design of the form was simplified so that teachers could easily fill it out, and the transitions between color and shape categories were made more transparent. At the end of this process, the Basic Concept Knowledge Checklist was finalized as an instrument to explore children's basic concept knowledge.

3.7. Data Analysis

Stake (1995) argues that qualitative data are commonly used in case studies. In contrast, Yin (2002) supports using quantitative and qualitative data to triangulate data. This planned combination of data sources allows researchers to gain deeper insights and develop consistent lines of inquiry. It can be needed if the case studies evaluating interventions often use qualitative interviews to explain the implementation process and complement these with quantitative surveys to compare outcomes and effectiveness. Jensen and Rodgers (2001) support this idea that a major strength of the case study method is the use of multiple sources and techniques for data collection. It is important to decide beforehand what evidence to collect and which analysis methods to apply to the data to answer the research questions. While the data collected are typically qualitative, they can also be quantitative. Data collection tools can include surveys, interviews, document reviews, observations, and even the collection of physical artifacts and archival records. Unlike other qualitative approaches, case study research allows investigators to collect and

combine quantitative survey data, helping comprehensively understand the phenomenon being studied (Yin, 2009). In a case study, data from various sources are integrated during the analysis process rather than treated separately. Each data source acts as a piece of the "*puzzle,*" contributing to the overall understanding of the phenomenon. This integration strengthens the findings by weaving together different strands of data, enhancing the understanding of the case (Baxter, Jack, 2008).

According to Wilson (2017), while analyzing the quantitative data in educational case studies, researchers can employ specific techniques such as organizing information into arrays, creating flowcharts or other visual displays, and counting the frequency of events. The collected quantitative data should be used to confirm and support the qualitative data, which is useful for understanding the reasoning or theory behind relationships. Based on this approach, the themes and categories emerging from the qualitative data were shared in this study, and the results obtained from the logographic reading tests were discussed descriptively and visualized with graphs. All findings were combined and presented to address the research questions posed in the study.

The analysis was conducted in four stages: open coding, axial coding, selective coding, and cross-case analysis. The process of qualitative data analysis is demonstrated in Figure 3.6.

In qualitative research, coding involves creating ideas and concepts from raw data. It refers to the steps researchers take to identify, organize, and systematize the ideas, concepts, and categories discovered in the data (Given, 2008).

Open coding was employed as the initial step in the data analysis to identify and categorize raw data into meaningful segments. According to Saldana (2012), open coding involves examining the data in detail and marking relevant or significant segments. This method was chosen to allow a broad interpretation and categorization of data. It captured all potential themes related to preschool children's logographic reading and their receptive, expressive skills on colors and shapes. During this phase, data from observations and interviews were reviewed. Each relevant segment was

assigned a descriptive code. For example, children's ability to recognize colors was coded as "*Color Recognition,"* while their ability to identify shapes was coded as "*Shape Identification."* Themes such as "*Recognizing Environmental Prints,*" "*The Role of Environmental Prints on Receptive, expressive Skills Concepts Knowledge,*" and "*Child Environmental Print Interaction*" were identified. This initial coding included codes derived directly from the data and themes identified in the literature review. In the second step in the data analysis, axial coding was used to link categories and subcategories, providing a more detailed and structured understanding of the data.

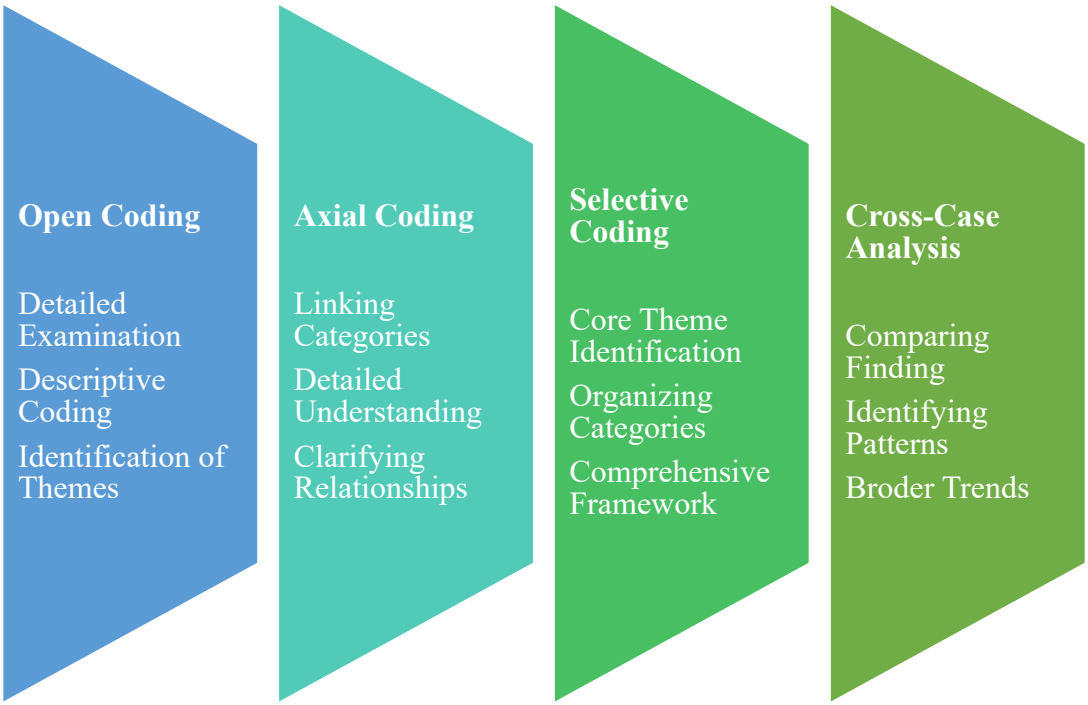


Figure 3. 6. The Process of Qualitative Data Analysis

Axial coding enhances the depth of analysis by clarifying the relationships and interactions between different data segments (Merriam, 2009). For instance, relationships between categories such as "*Recognizing Environmental Prints*" and "*The Role of Environmental Prints on Receptive, expressive Skills Concepts Knowledge*" were examined. Themes were connected to broader contexts, such as emergent literacy. Selective Coding was utilized as the third step in the data analysis to identify the core themes that capture the essence of the research. Selective coding,

as defined by Saldana (2012) and Merriam (2009), involves selecting a core category and organizing other categories around it to create a comprehensive thematic framework. With the help of selective coding, the analysis is organized around central, relevant themes that address the research questions comprehensively. In this phase, a central category, such as "*Impact of Environmental Print Activities,*" was selected from the categories identified through axial coding. Subcategories were organized around this central theme, providing a coherent narrative for the analysis. Cross-case analysis was conducted as the final step in the data analysis to compare findings across different cases, identifying common themes and patterns. According to Miles and Huberman (1994), cross-case analysis presents broader trends and themes across multiple cases, providing a more comprehensive understanding of the phenomenon under study. Themes and sub-themes identified through selective coding were compared across different cases (e.g., children's logographic reading skills, comparison of how boys and girls responded to environmental print activities, revealing gender-specific differences in receptive, expressive skills).

In this study, MAXQDA software is utilized, providing a variety of functions that aid in the analysis of qualitative data. The original data in audio-visual files from observations and tape records from interviews were initially transferred to MAXQDA, a qualitative data analysis software program. It was chosen for its advantages, including memoing, coding, annotating audiovisual data, and facilitating practical data management and organization. Responses to each question in the interview protocol were coded using keywords and phrases with the help of various filters in MAXQDA. Data from each question was then analyzed across all respondents. Additional codes were applied to the data to create themes discussed in the data analysis. The interview questions were organized into groups corresponding to the research questions and demographics. Data was coded within these groups to identify themes throughout the case study.

In the process of observation analysis, the observation rubric was used to assess logographic reading and receptive, expressive skills on colors and shapes dimensions in children. Each observation session was video-recorded and analyzed regarding time spent in the EP Learning Center, the child's performance on various levels of

logographic reading and receptive, expressive skills on concept knowledge, identifying common patterns with the help of an observation rubric. In analyzing observation data, each child who came to the EP learning center was examined in terms of the skills observed in the observation rubric, and the rubrics were filled in for each observation session. Then, the results obtained from the rubrics were visualized and presented through graphs in a way that could serve to answer the research questions. The findings from the observation were represented using graphs like bar charts to show '*Weekly Participation in The Learning Center,*' '*Weekly Distribution of Logographic reading skills by Level,*' and *'Weekly Distribution of Receptive and Expressive Skills on Colors and Shapes,*' In addition, observation findings compare the findings related to children's gender. In this context, the distribution of children's preference for EP learning center during free play time by gender and the percentage of children whose receptive, expressive skills are observed in terms of gender were presented with the help of observation data. Moreover, the average time spent (minutes) in the EP learning center by gender was illustrated.

The process of checklist analysis, completed by the class teacher for each child, was quantified by representing the proportion of children who demonstrated proficiency in color and shape concepts through receptive and expressive skills as percentages for each checklist item. This approach facilitated comparisons of receptive, expressive skills before and after the implementation and allowed for an analysis of these skills by gender. The results were subsequently visualized and depicted in graphical format for presentation.

The analysis of the logographic reading test involved several systematic steps to ensure accurate interpretation of the data. SPSS (Statistical Package for the Social Sciences), which facilitated the detailed examination and visualization of descriptive data, was used for the quantitative analysis. Initially, the raw data from the logographic reading tests were entered into SPSS. Each child's performance on various test items was recorded, ensuring the data was accurate and complete. The data was then cleaned by checking for any missing values or outliers. Descriptive statistics were computed to summarize the central tendencies and dispersion of the logographic reading scores. The mean, median, mode, and standard deviation were

calculated to provide a clear overview of the children's overall performance. Frequency distributions were also generated to understand the number of children falling into different performance categories. To facilitate the interpretation and presentation of the results, various graphs were created using SPSS. Bar charts were generated to depict the distribution of scores. For example, the performance of boys versus girls was compared to identify any patterns or differences. The results from the descriptive statistics and visualizations were interpreted to draw meaningful conclusions about the logographic reading skills level of the children. Finally, these findings were integrated with the qualitative data obtained from interviews and observations. This triangulation of data sources provided a holistic understanding of the children's outcomes, ensuring that the conclusions were well-supported.

In the reporting study findings, specific quotes from the interviews vividly portray the teachers' and mothers' perspectives. They shared children's learning experiences in class and home environment. The data collection process proved highly insightful and enlightening. The teachers' and mother's experiences, enthusiasm, and dedication were evident in their detailed answers and shared visual materials. Throughout the data collection, meticulous effort was made to preserve the authenticity of their voices. Transcripts were generated to capture comprehensive responses to the interview questions. Listening to each participant's voice recordings, transcribing their words, crafting detailed response notes, and connecting these with other data sources, including observation notes, checklists, and logographic reading tests, enriched the data collection and analysis processes.

According to Saldana (2012), intercoder reliability, or inter-rater reliability, is significant in qualitative data analysis to maintain consistency and reliability in the coding process. Intercoder reliability includes multiple coders independently analyzing the same data set and comparing their coding results to identify and resolve differences. This process validates the coding scheme and ensures that the data is interpreted consistently. The current study established a four-step process to ensure intercoder reliability. In the first step, a consultation was held with a research assistant who holds a Ph.D. in early childhood education and language development. During the process, the purpose and design of the study were explained in detail. In

the second step, a pilot test was conducted on approximately 25% of the data (10 transcripts of the interview with mothers and teacher and three observation sessions video-recording). In this phase, the main researcher and second coder independently coded the selected part of the data. This step helped identify any misunderstandings in the coding scheme. In the third step, three separate meetings were held to discuss the coders' decisions and address any differences. These meetings allowed the coders to explain their rationale and reach a consensus on how to apply the codes. In the final step, the formula described by Miles and Huberman (1994) was used, and the reliability scores for the two independent coders analyzing the interviews with teacher were .94 and mothers .91. According to Miles and Huberman (1994), an 80% agreement between multiple coders is sufficient for interrater reliability.

3.8. Trustworthiness of the Study

This research used four strategies: credibility, transferability, dependability, and confirmability, to ensure the study's trustworthiness. Credibility, which pertains to establishing the truth value of findings, aligns with internal validity in quantitative studies. Transferability, which is concerned with determining the extent to which findings can be applied in other contexts, corresponds to external validity in qualitative research. Dependability, indicating the consistency of findings upon repetition with the same participants and contexts, is akin to reliability in quantitative inquiry. Confirmability involves establishing neutrality in the study's findings (Lincoln and Guba, 1985). Lincoln and Guba (1985) propose specific techniques within these strategies to ensure trustworthiness. This study employed prolonged engagement, persistent observation, triangulation, and member checks to ensure credibility.

Prolonged Engagement: The investigator invested time before the implementation to familiarize the children, mothers, class teacher, settings, and context. This prolonged engagement builds trust between the investigator and participants, facilitating rich data acquisition during the actual data collection process (Lincoln and Guba, 1985).

Persistent Observation: Concurrent with prolonged engagement, the researcher observed the class environment, the educational context in preschool, and children's

characteristics in the educational process, exploring intricate details. This approach provides in-depth data for interpretation during the data analysis (Lincoln and Guba, 1985).

Triangulation: Denzin (2003) categorizes triangulation into data triangulation, observer triangulation, methodological triangulation, and theory triangulation. In this study, two forms of triangulation are ensured—data triangulation (involving children, their mothers, and class teacher) and methodological triangulation (involving observations, interviews, and quantitative data-logographic reading tests). The researcher collected data from children using logographic reading tests and observations, while interviews were conducted with their mothers and teachers.

Member Checks: This technique is crucial for ensuring credibility, considering the different lenses, perspectives, and values of the researcher and participants. They may interpret data differently. In this study, after the interview protocol process, transcripts and interpretations from mothers and class teacher were reviewed by themselves (Creswell, 2012).

A *thick description* was employed in this study to ensure transferability. This involves describing the cases (children and their literacy characteristics), case boundaries, research context, implementation process, and learning environment in detail. This approach allows readers to understand experiences and meaningfully match research questions with findings (Merriam, 2009).

An audit trail was used in this study to ensure dependability and confirmability. This involves transparently representing the research process and decision-making procedures step-by-step when reporting the study's findings (Lincoln and Guba, 1985). Diagrams were presented in this paper to establish an audit trail.

3.9. Ethical Consideration

This study addressed several key ethical considerations, including informed consent, confidentiality, and data storage and security. Before starting the study, approval was

obtained from the Middle East Technical University Human Subjects Review Board (Appendix A) and the Ministry of National Education (Appendix B). After receiving these approvals, a meeting was organized where the researcher explained the study process in detail to all participants, including young children, their mothers, and the class teacher. The researcher provided clear explanations of the study's purpose and procedures. The explanation was adjusted to the developmental level of young children and communicated using simple sentences. For example, instead of saying, "*You will be observed during your interactions in free play time,"* the researcher said, "*I will watch how you play and learn with your friends in free play time*." Informed consent forms were then distributed to the mothers and the class teacher, followed by discussions to answer any questions and ensure they fully understood the study. During the study, the children always obtained verbal assent before engaging in any activities, ensuring they were comfortable and willing to participate at each step. This thorough process ensured voluntary participation and adherence to ethical standards (Hood, Kelley, and Mayall, 1996).

The researcher assured participants their identities and personal information would be kept anonymous to guarantee confidentiality. All collected data were anonymized before analysis and reporting. Pseudonyms were used to protect the identity of the participants in any written or published material (Creswell, 2012). This commitment to confidentiality helped build trust between the participants and the researcher, ensuring that sensitive information was handled with care and respect (Amos Hatch, 1995).

Data security was a significant aspect of this study. All collected data, including interview recordings, transcriptions, observation notes, and photographs, were securely stored on a password-protected computer. Access to this data was restricted solely to the researcher (Lincoln, Guba, 1985). Additionally, any physical data, such as consent forms and handwritten notes, were stored in a locked cabinet. Photographs were handled with particular care; explicit consent was obtained from participants for the use of any photographs, and these images were stored and used in compliance with ethical guidelines to protect the privacy of the individuals involved. These key

ethical considerations ensured the protection of participants' rights and well-being (Lincoln and Guba, 1985) for this study.

3.10. Limitations

Despite the comprehensive nature of this study, certain limitations are acknowledged, shaping the contextual understanding of the findings. The first one is related to subjectivity in qualitative data. Using semi-structured interviews and observations introduces a subjective element to data interpretation. While efforts are made to ensure rigor, individual perspectives and interpretations may influence the reliability and objectivity of the qualitative findings.

However, several strategies were employed to reduce this risk. Triangulation was used by incorporating multiple data sources and methods, including semi-structured interviews, observations, and logographic reading tests. This approach improved the credibility of the findings by allowing cross-checking from different angles. Additionally, member checks were conducted, where transcripts and interpretations were reviewed by participants, such as mothers and the class teacher, to ensure their accuracy and authenticity. Regular peer debriefing sessions were also held to review and challenge the findings, preventing data interpretations from being only influenced by the researcher’s perspective. Finally, a detailed audit trail was maintained, documenting all steps of the research process and decision-making procedures, which enhanced the reliability and confirmability of the study. Using these strategies, the study aimed to minimize subjectivity and ensure the strength and trustworthiness of the qualitative findings.

Moreover, focusing on a specific age group of 48-54 months in participant selection may limit the generalization of outcomes to a broader demographic spectrum. Variability in developmental trajectories within different age groups may not be fully captured. Next, the current study was conducted as a case study with contextual boundaries. The study is confined to a state preschool in Sincan, Ankara, which may impact the transferability of results to diverse geographical or institutional contexts. Educational settings with distinct characteristics might yield different outcomes.

Limiting the study to a single-state preschool introduces potential bias. Findings may not fully represent the diversity of preschool educational approaches and practices. Finally, the data collection timeframe is another limitation of the present study. The researcher initially planned a ten-week implementation period, which might be considered insufficient for fully integrating environmental print into the classroom. Notably, in the relevant literature, many investigations, including activities with environmental print or programs, typically extend between eight and ten weeks.

By acknowledging these limitations, the study aims to communicate the scope of its findings transparently and contribute to a detailed interpretation of the observed effects on children's logographic reading and receptive, expressive skills on colors and shapes.

CHAPTER 4

FINDINGS

This chapter presents the findings of the study based on the research questions outlined previously. The data were collected through various instruments, including the information form on the frequency of interaction between environmental print and children, logographic reading skills tests, observations, and semi-structured interviews with mothers and the classroom teacher. Additionally, checklists filled out by the teacher, as well as findings of children's logographic reading and receptive, expressive skills were examined concerning gender. Each section of this chapter details the findings from these instruments, followed by comparisons of the pre-and post-test findings. Finally, key findings were summarized.

The findings and interpretations presented in this section predominantly rely on direct verbatim participant quotations. This approach aids in contextualizing the interactions and explaining the themes and sub-themes identified through data analysis. Consequently, quotations are extensively used to present the diversity among participants and maintain the authenticity of their perspectives. Each participant has been assigned a code number to ensure confidentiality. Participants and their responses were coded by each as Child 1, (C1), through (C1, C2, C3, C4, ..., C 17, C18), as Mother 1, (M1), through (M1, M2, M3, M4, …, M17, M18). Additionally, “T” was used to refer to the teacher.

4.1. Information Form on the Frequency of Interaction between the Environmental Print and Child

In the context of this research, the "*Information Form on the Frequency of Interaction between the Environmental Print and Child*" is an essential form for

several reasons. The form enables the data regarding the frequency and nature of children's interactions with environmental print before the implementation. Environmental print refers to the print found in the everyday environment, such as signs, labels, and logos. The "*Information Form on the Frequency of Interaction between the Environmental Print and Child*" allows a view of the children's pre-existing knowledge and experiences about the study context. Moreover, it provides insights into the frequency of child-mother interaction regarding environmental prints, which are essential for understanding the context of the study.

Before conducting pre-interviews with mothers, they were requested to complete an information form regarding the frequency of their children's interactions with environmental prints. The objective was to gather information about each child individually and provide an overview of their interests and the frequency of their engagement with such stimuli. It focuses on how often children engage in conversations about environmental prints (EPs) with their mothers, show interest in reading materials, request help recognizing EPs, and independently recognize EPs. The data is segmented into five categories: *"Never," "Rarely," "Once a Week," "Once a Day," and "Several Times a Day."* In this context, Figure 4.1 demonstrates the frequency of children's interactions with environmental prints (EPs) based on reports from their mothers.

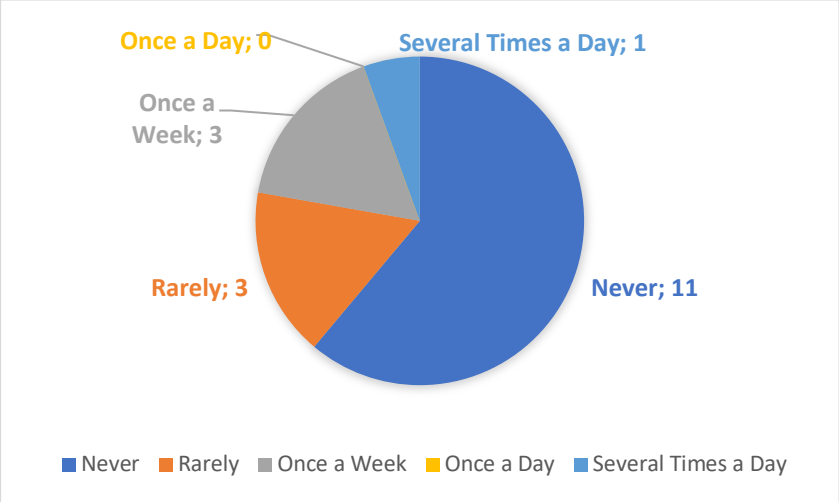


Figure 4. 1. Frequency of Conversation with Mothers about EP

This pie chart Figure 4.1 illustrates the frequency with which children engage in conversations about environmental prints (EPs) with their mothers. The largest segment of the chart, representing 11 mothers, indicates that these children never discuss environmental prints with their mothers. This displays a remarkable portion of the sample does not discuss EPs at home, which could have implications for their exposure to and engagement with literacy-related stimuli in everyday environments. Following this, three mothers are categorized under *"Rarely"* indicating limited interaction between the child and mother in discussing EPs. Similarly, three mothers fall under the *"Once a Week"* category, showing a minimal but more consistent engagement than those who rarely engage. Notably, only one mother reported conversing about EPs with their children several times daily. On the other hand, the *"Once a Day"* category has no mothers, indicating that daily discussions about EPs are not common in this sample. The data reveals that most children in this sample have infrequent or no discussions with their mothers regarding environmental prints.

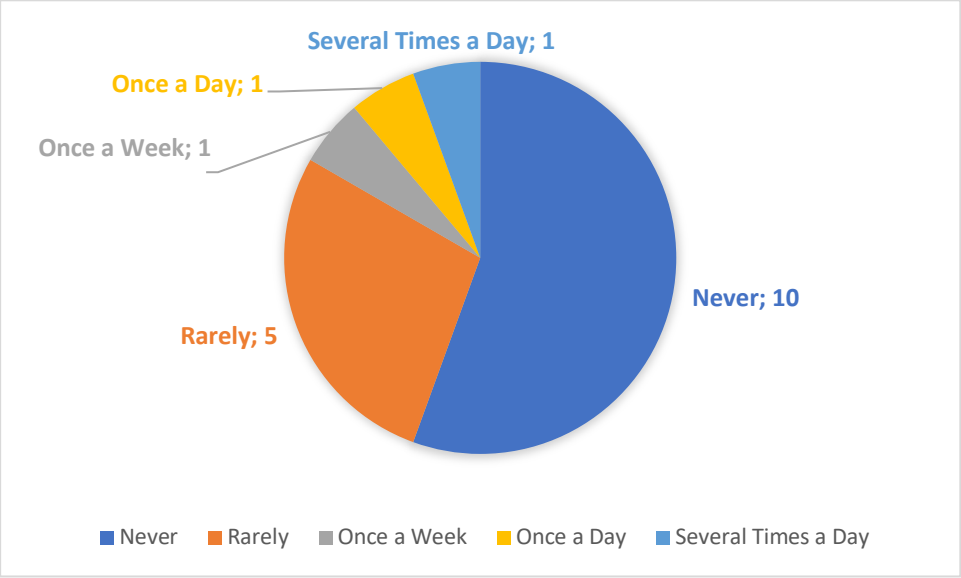


Figure 4. 2. Frequency of Interest in Reading Materials

As demonstrated in Figure 4.2, the pie chart represents the frequency with which children show interest in reading materials related to environmental prints (EPs). The most notable proportion of the chart, representing ten mothers, indicates that their children never show interest in reading materials related to EPs. This finding reveals

a considerable lack of engagement with EP materials. Next, five mothers reported that their children rarely show interest in such materials, indicating limited interaction with EP-related content. Meanwhile, one mother reported that their child shows interest in environmental prints and reading materials once a week, once a day, or several times a day. Overall, the data indicates that a considerable portion of the sample (N_M=10) reported that their children are not interested in reading materials connected to environmental prints, highlighting a potential gap in exposure to and engagement with literacy materials that could support early reading skills.

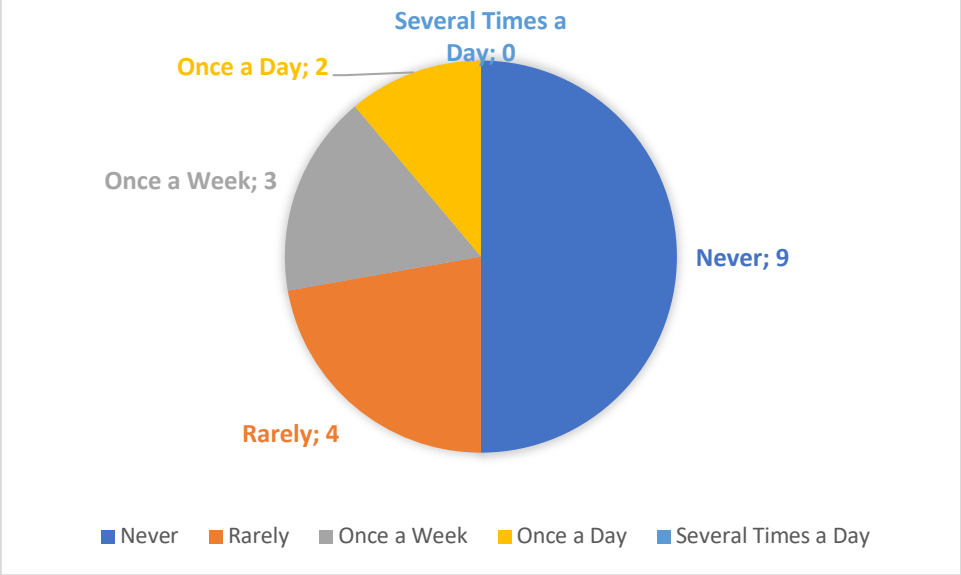


Figure 4. 3. Frequency of Requesting Help from Mother to Recognize EP

The pie chart Figure 4.3 indicates the frequency at which children request assistance recognizing environmental prints (EPs). The largest segment, representing nine mothers, expresses that their children never request help recognizing EPs. Next, four mothers reported that their children rarely request help recognizing EPs. Additionally, three mothers indicated that their children ask for help once a week, while two mothers noted that their children request assistance once a day. Interestingly, no mothers reported that their children request help several times a day, which indicates that frequent requests for assistance with EP recognition are uncommon in this sample. The data highlights that most children in this sample never or rarely request help recognizing environmental prints.

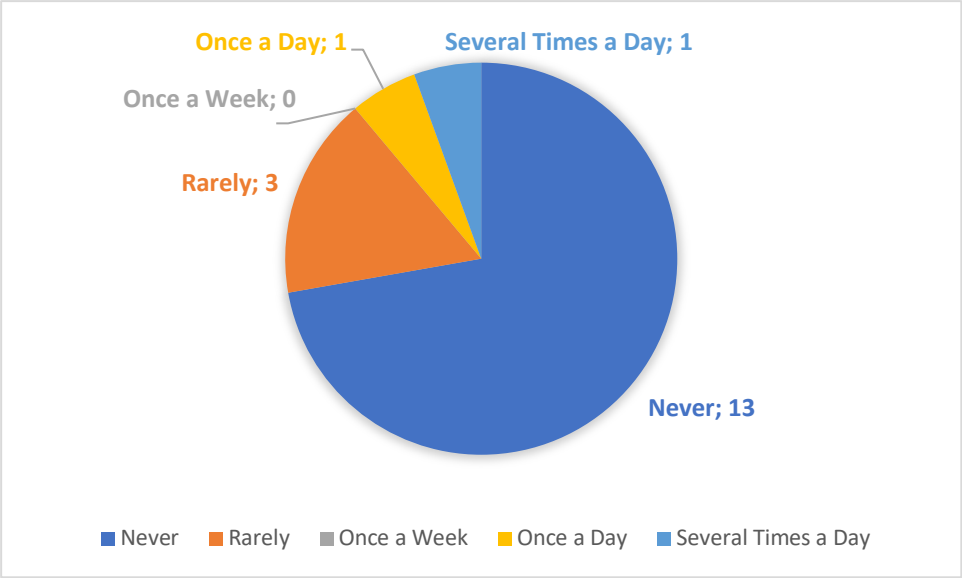


Figure 4. 4. Frequency of Child's Self-Recognition of EP

As revealed in Figure 4.4, the pie chart demonstrates the frequency with which children independently recognize environmental prints (EPs). The most considerable portion of the chart, representing 13 mothers, indicates that their children never independently recognize environmental prints. This means a remarkable portion of the sample does not engage in or may lack the ability to identify EPs independently. After that, three mothers reported that their children rarely recognize EPs independently. Additionally, one mother indicated that her child recognizes EPs once a day, and another noted that her child recognizes EPs several times a day. Interestingly, no mothers reported that their children recognize EPs weekly. The data display that most children in this sample either never or rarely engage in self-recognition of environmental prints.

Figure 4. 5. Word Cloud related to Recognized EPs

Word cloud analysis, as seen in Figure 4.5, is a visualization technique that represents the frequency of words within a dataset by varying the size of each word according to its frequency. In this context, it demonstrates the environmental prints (EPs) most recognized by children, with larger words indicating a higher recognition ability. The word cloud indicates that children most frequently recognize single-word market names (e.g., A101, BIM) that are common in their neighborhood and often exposed, automobile logos (e.g., Ford, BMW, Toyota), and frequently consumed food and beverage brands (e.g., Coca-Cola, Danone, Burger King, Dido, Domino's) in their daily lives. Furthermore, functional EPs such as traffic and toilet signs are also prominently recognized. Additionally, except for one child, all children can realize their names when they see the written form of their names.

Taken together, the findings indicate that many children do not engage in conversations about environmental prints (EPs) with their mothers, suggesting limited discussion of these EPs within their daily lives. Furthermore, many children are not interested in reading materials and EPs, and their engagement levels are low. Regarding recognition, most children do not seek assistance from their mothers in identifying EPs, reflecting a minimal level of involvement in tasks requiring external support. Additionally, some children rarely or never recognize EPs independently, indicating a lack of spontaneous interaction with such stimuli in their daily environments. However, when recognizing EPs, children predominantly include familiar and frequently encountered environmental prints such as market names, automobile logos, and widespread food and beverage brands. Functional EPs, such as traffic and toilet signs, are also commonly identified. Notably, almost all children can recognize their written names, indicating familiarity with personal environmental prints.

4.2. The Children’s Logographic Reading Skills

The logographic reading test in this study aims to assess the logographic reading skills of 48-54-month-old preschool children. This test evaluates logographically how well children can recognize and interpret environmental prints, such as logos, symbols, and emblems. The test consists of 20 EP items, and children are asked to identify each item with the prompt, "*What does this say*?" Scoring is based on a scale

of 2 points for correct answers, 1 point for responses with partial meaning, and 0 points for incorrect answers or no response, which means that children can achieve a maximum of 40 points per level. The test comprises five levels, ranging from the original product with EP *(Level 1)* to the plain text form of the EP *(Level 5),* with each level reflecting varying degrees of difficulty and knowledge.

4.2.1. The Children's Logographic Reading Skills Pre-test Results

Descriptive analyses were conducted to determine the child's initial logographic reading skills, ranging from the easiest *(Level 1)* to the most challenging *(Level 5).* The minimum, maximum scores, means, and standard deviations of children's logographic reading skills pre-test are demonstrated in Table 4.1. According to descriptive statistics of the pre-logographic reading test, in the first two levels, Level 1 (*M=14.38*) and Level 2 (*M=13.88*), the mean scores are relatively high, however in Level 3 (*M=4.88)* and Level 4 (*M=3.72*), the mean scores drop dramatically. In Level 5, all children scored zero, resulting in a mean score of zero.

Table 4. 1. Descriptive Statistics for the Pre-test of Logographic Reading

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test/ Level 1	18	4.0	20.0	14.389	4.0749
Pre-test/ Level 2	18	4.0	19.0	13.889	3.9836
Pre-test/ Level 3	18	.0	12.0	4.889	3.7556
Pre-test/ Level 4	18	.0	9.0	3.722	2.6525
Pre-test/ Level 5	18	.0	.0	.000	.0000
Valid N (listwise)	18				

In this section, each child's logographic reading skills at each level of understanding is presented as a percentage. It also includes bar charts representing the pre-test performance of each child at different levels of logographic reading proficiency. Each bar chart aims to illustrate the percentage scores for Levels 1 through 5, providing a clear visual comparison of the children's logographic reading skills across varying levels of complexity.

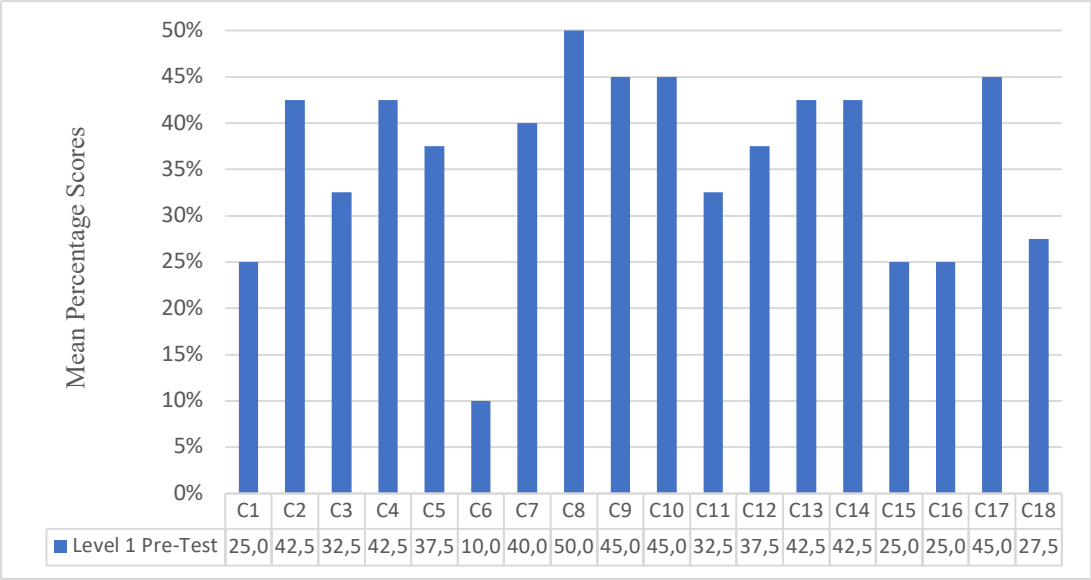


Figure 4. 6. Mean Percentage Scores for Pre-test Level 1

As indicated in Figure 4.6, all children exhibited scores ranging from 10% to 50%. Half of the 18 children participating in the study scored 40% and above. Children who scored between 25% and 40% constituted approximately one-third of the group, with five children performing within this range. The remaining group consisted of children who scored 25% and below, with four children falling into this category. These children demonstrated lower performance compared to the others.

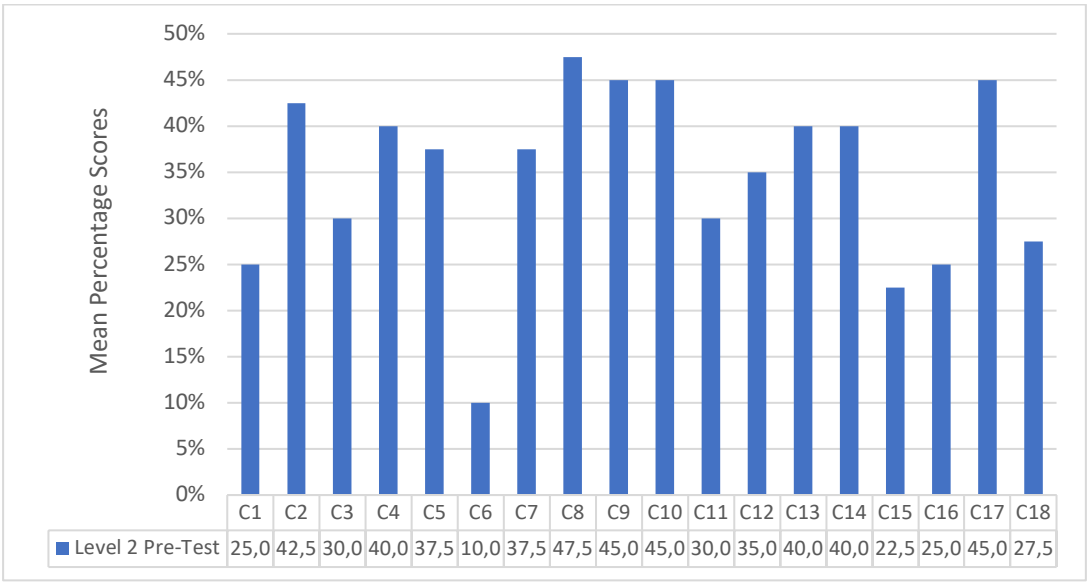


Figure 4. 7. Mean Percentage Scores for Pre-test Level 2

As displayed in Figure 4.7 scores were slightly lower, yet still considerable, ranging from 10% to 47.5% compared to Level 1 pre-test results. Specifically, eight children scored 40% or higher. One-third of the children scored between 25% and 40%. The remaining four children scored 25% or below.

These results demonstrate that while the overall performance distribution in Level 2 is like that of Level 1, there is a slight decrease in the highest scores. This consistency in performance levels suggests that the children maintained their logographic reading skills across both Level 1 and Level 2.

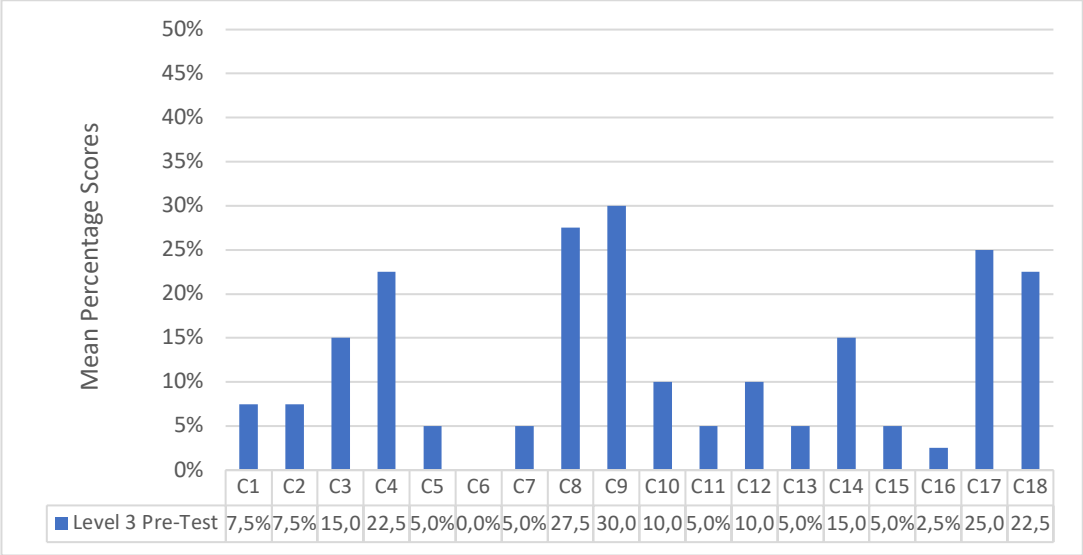


Figure 4. 8. Mean Percentage Scores for Pre-test Level 3

As shown in Figure 4.8, there was a notable decrease in scores, which ranged from 0% to 30%. This indicates that the overall performance level is lower than the Level 1 and 2 pre-test results. Five children participating in the study scored 20% and above. Children who scored between 5% and 20% constitute a group of six children. The children who scored 5% or below constitute the remaining group. This group includes seven children.

These results indicate that the overall performance in Level 3 is lower compared to Level 1 and Level 2. This decline displays that children's level of logographic reading skills decreases as environmental print is presented in more complex forms.

This level challenged the children's level of logographic reading skills without any product context.

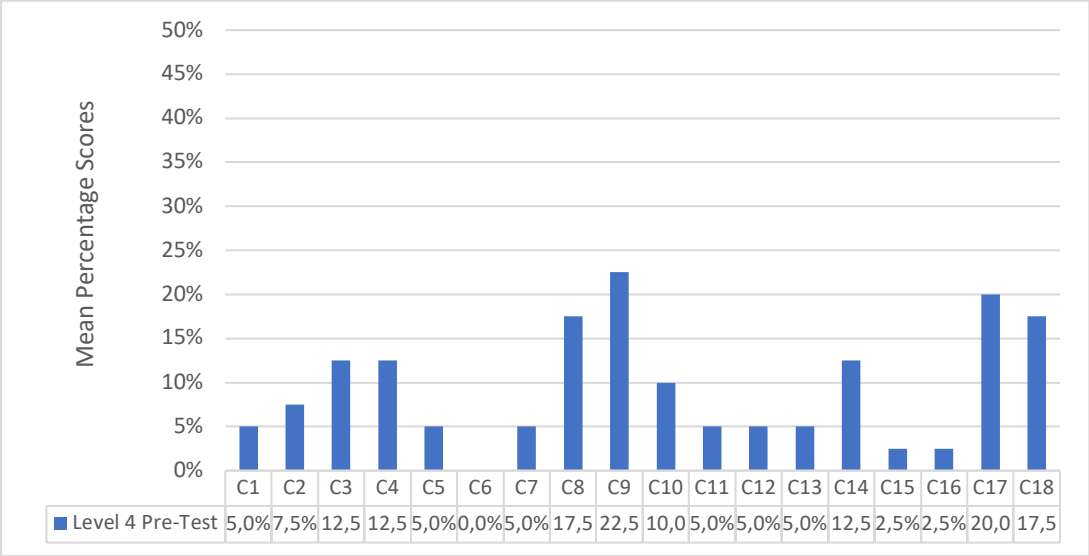


Figure 4. 9. Mean Percentage Scores for Pre-test Level 4

As demonstrated in Figure 4.9 the scores of children in the Level 4 pre-test ranged from 0% to 22.5%. This indicates that the overall performance level is lower than the Level 1, Level 2, and Level 3 pre-tests. Only 4 out of the 18 children participating in the study scored 15% and above. Six children scored between 5% and 15%. Eight children scored below 5% or below, making up the remaining part of the group. This shows that most children performed within this range, and their logographic reading skills is relatively low for Level 4.

These results indicate that the overall performance in Level 4 is lower compared to Level 1, Level 2, and Level 3. This decline demonstrates that children's level of logographic reading skills decreases as environmental print is presented in more challenging forms. Additionally, the absence of color in EPs caused the difficulty of logographic reading skills. This level challenged the children's logographic reading skills without product context and color cues.

For Level 5, which is the most challenging level of logographic reading skills, presented as the plain text form of EPs in the study, all children scored 0%.

4.2.2. The Children's Logographic Reading Skills Post-test Results

Descriptive analyses determined the child's post-logographic reading skills, ranging from the easiest *(Level 1)* to the most challenging *(Level 5)*.

Table 4. 2. Descriptive Statistics for the Post-test of Logographic Reading

	N	Minimum	Maximum	Mean	Std. Deviation
Post-test/Level 1	18	20.0	34.0	27.444	3.8839
Post-test/Level 2	18	19.0	34.0	26.611	4.3133
Post-test/Level 3	18	8.0	31.0	20.556	6.1951
Post-test/Level 4	18	8.0	30.0	18.611	6.2604
Post-test/Level 5	18	.0	13.0	2.167	3.6501
Valid N (listwise)	18				

The minimum, maximum scores, means, and standard deviations of children's logographic reading post-test are demonstrated in **Hata! Başvuru kaynağı b ulunamadı.**. According to these descriptive statistics for the logographic reading post-test, children exhibited relatively high mean scores at the initial two levels, with Level 1 (*M=27.44*) and Level 2 (*M=26.61*) the mean scores relatively high. The mean scores slightly decreased at Level 3 (*M=20.55)* and Level 4 (*M=18.61*). At the most challenging Level 5 (*M=2.16)*, indicating a notable drop in performance.

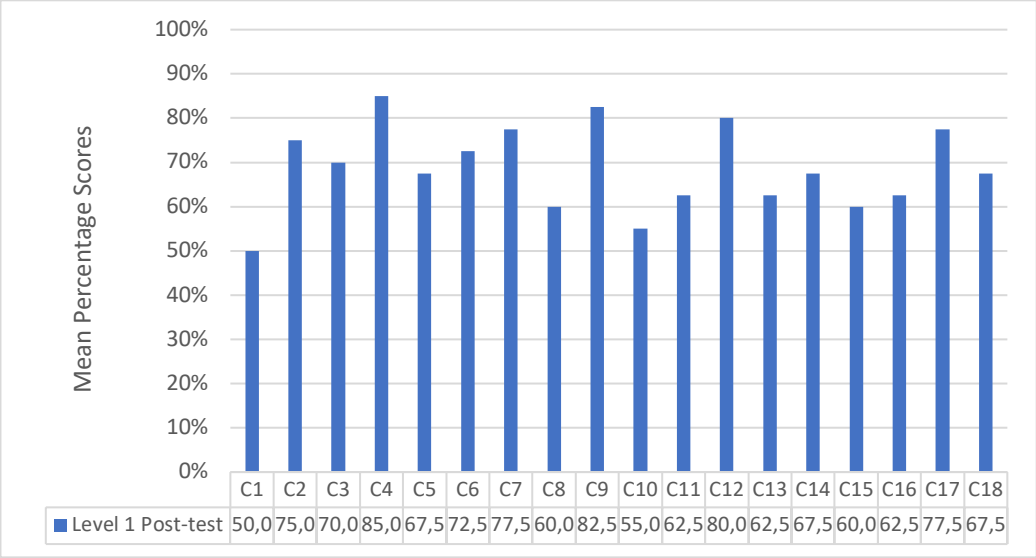


Figure 4. 10. Mean Percentage Scores for Post-test Level 1

Figure 4.10 presents the post-test results for Level 1, revealing that logographic reading success rates among the children ranged from 50% to 85%. Many children demonstrated logographic reading success rates above 60%, indicating a relatively strong proficiency in logographic reading at this level. A portion of the children achieved 75% and above success rates, reflecting a high level of recognition and interpretation of environmental prints. Conversely, fewer children exhibited lower success rates, with the lowest recorded success rate being 50%.

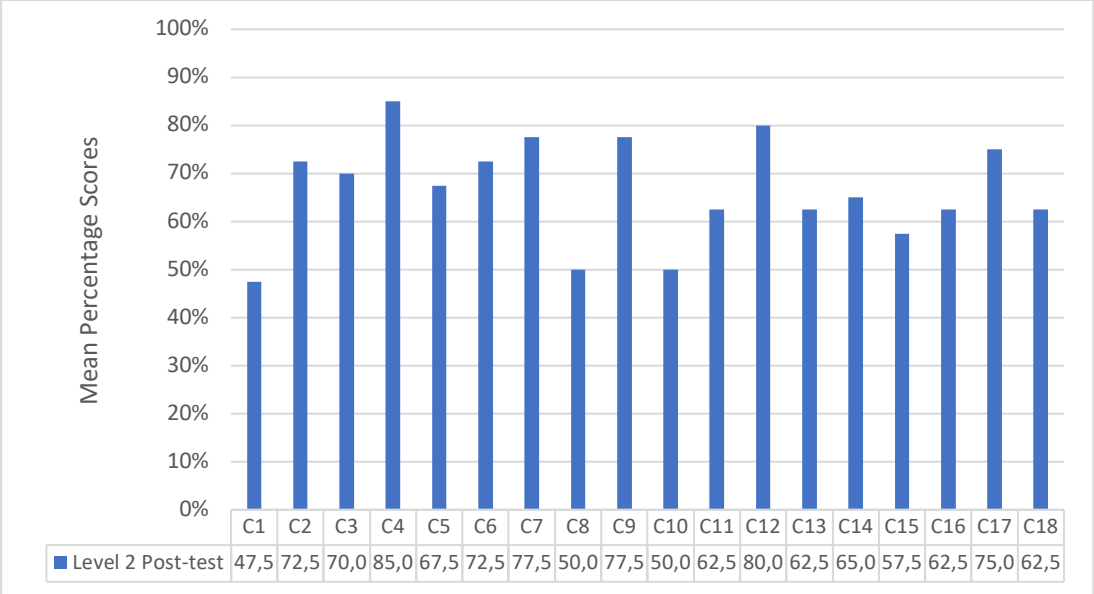


Figure 4. 11. Mean Percentage Scores for Post-test Level 2

As demonstrated in Figure 4.11, the post-test results indicate that at Level 2, the success rates for logographic reading range from 47.5% to 85% among the children. Most of them demonstrated logographic reading proficiency above 60%, with seven children achieving success rates of 70% and above and the highest success rate recorded at 85%. Conversely, the lowest logographic reading success rate was at 47.5%.

Based on the post-test results, the majority of children demonstrated logographic reading proficiency that exceeded the average level. Specifically, seven children exhibited high levels of success, with the top performer achieving a notably high proficiency. In contrast, the lowest observed level of logographic reading performance was remarkably lower than the others.

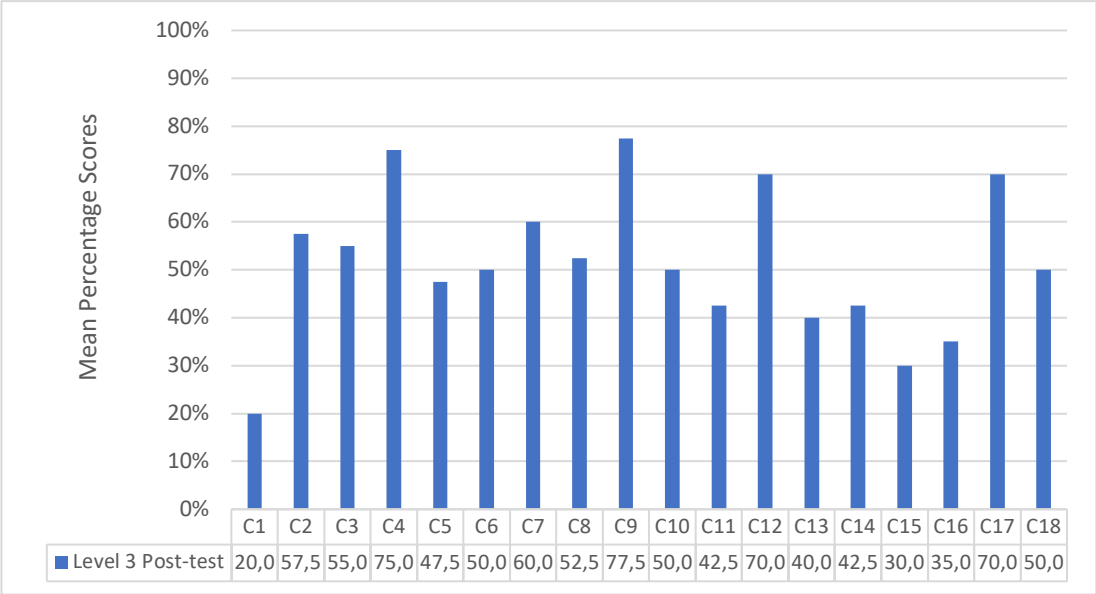


Figure 4. 12. Mean Percentage Scores for Post-test Level 3

The results of the post-test reveal that among children at Level 3, presented in Figure 4.12, the success rates for logographic reading range from 20% to 77.5%. Many children performed at a success rate of over 50%. Specifically, four children achieved 70% and higher success rates, with the highest success rate being 77.5%. Conversely, the lowest logographic reading success rate observed was 20%.

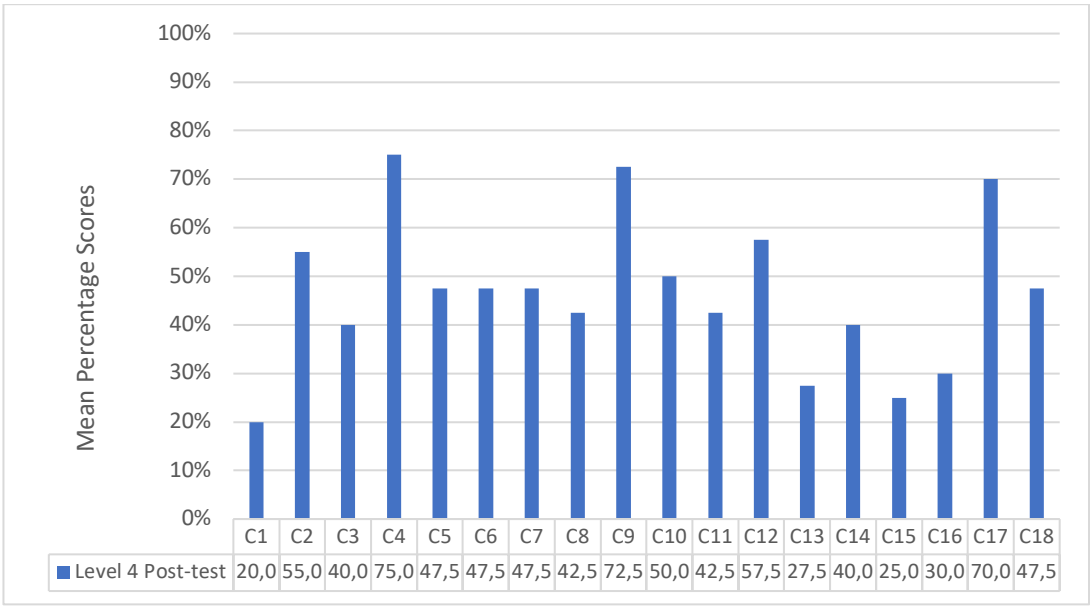


Figure 4. 13. Mean Percentage Scores for Post-test Level 4

According to post-test results in Level 4, as seen in Figure 4.13, the logographic reading success rates vary from 20% to 75%, with most children performing above 50%. Three children attained 70% and higher success rates, with the highest success rate being 75%. The lowest success rate recorded was 20%.

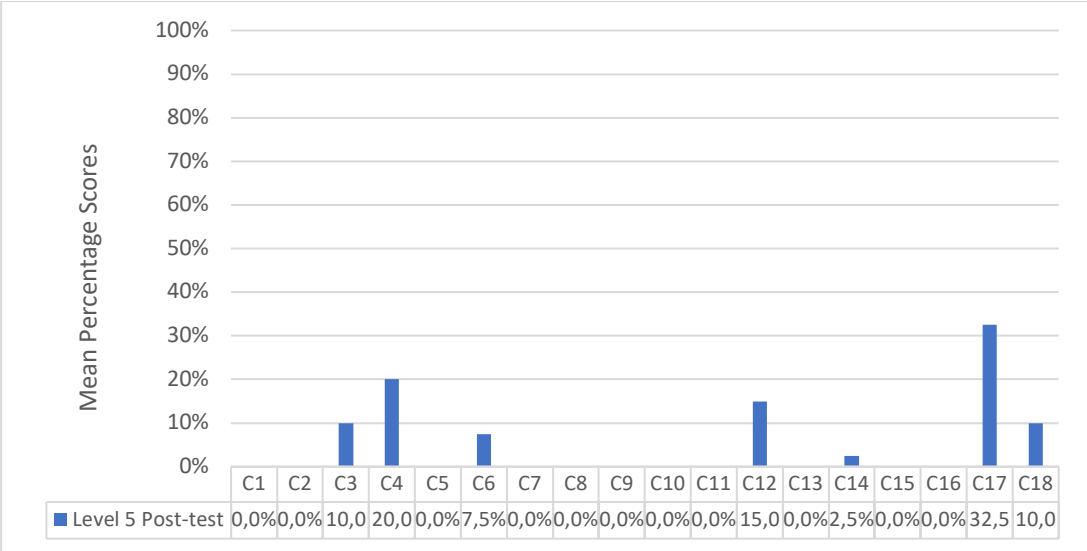


Figure 4. 14. Mean Percentage Scores for Post-test Level 5

In Figure 4.14, the post-test results in Level 5 reveal a wide range of logographic reading success rates among the children, spanning from 0% to 32.5%. Many children demonstrated performance below 10%, indicating significant challenges in achieving logographic reading proficiency. Notably, only one child achieved a success rate exceeding 30%, with the highest success rate recorded at 32.5%. Remarkably, at Level 5, most children displayed low success, pointing to limited proficiency in logographic reading at this level.

In brief, post-test results of children across five levels show that in Level 1, most children achieved success rates above 50%. In contrast, in Level 5, success rates notably declined, with most children demonstrating low performance. Overall, the success rates tend to decrease as the level increases, indicating that higher-level logographic reading skills is more challenging for the children. The highest success rates were achieved in Levels 1 and 2, indicating that children performed better on reading logographically at these levels. In contrast, Level 5 exhibited lower success

rates, displaying that the children's logographic reading skills at this level posed greater difficulty.

4.2.3. The Comparison of Children's Logographic Reading Skills

This section also presents the descriptive statistics (*mean*) for logographic reading test measures and the pre-post test, as shown in Table 4.3. In this part, the comparison of children's logographic reading performance in terms of the five different levels of logographic reading skills level, as indicated by the scores obtained before and after the implementation of activities.

Table 4. 3. Descriptive Statistics for the Pre-Post Test of Logographic Reading

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test/ Level 1	18	4.0	20.0	14.389	4.0749
Post-test/ Level 1	18	20.0	34.0	27.444	3.8839
Pre-test/ Level 2	18	4.0	19.0	13.889	3.9836
Post-test/ Level 2	18	19.0	34.0	26.611	4.3133
Pre-test/ Level 3	18	.0	12.0	4.889	3.7556
Post-test/ Level 3	18	8.0	31.0	20.556	6.1951
Pre-test/ Level 4	18	.0	9.0	3.722	2.6525
Post-test/ Level 4	18	8.0	30.0	18.611	6.2604
Pre-test/ Level 5	18	.0	.0	.000	.0000
Post-test/ Level 5	18	.0	13.0	2.167	3.6501
Valid N (listwise)	18				

A descriptive analysis of the data inTable 4.3. showed a remarkable improvement in logographic reading proficiency from the pre-test to the post-test. The initial scores at Level 1 *(M = 14.38)* indicated a basic knowledge of the logographic reading, demonstrating a marked increase in the post-test *(M = 27.44)* following the implementation of EP activities. Notable enhancements were also observed at Level 2, with an average score of *(M=13.88)* increasing to *(M = 26.61).* In addition to this, Level 3 commences at *(M=4.88)* and increases to *(M=20.55),* and Level 4 progresses

from *(M=3.72)* to *(M=18.61)*. The most advanced level, Level 5, demonstrated that children initially exhibited difficulties with no scores but subsequently achieved an average of *(M=2.16)* post-test. It indicates that the mean scores across all levels in the logographic reading test for the children participating in the study increased after participating in the activities. As seen in Figure 15, a comparison of the pre-test and post-test results from the logographic reading test is presented.

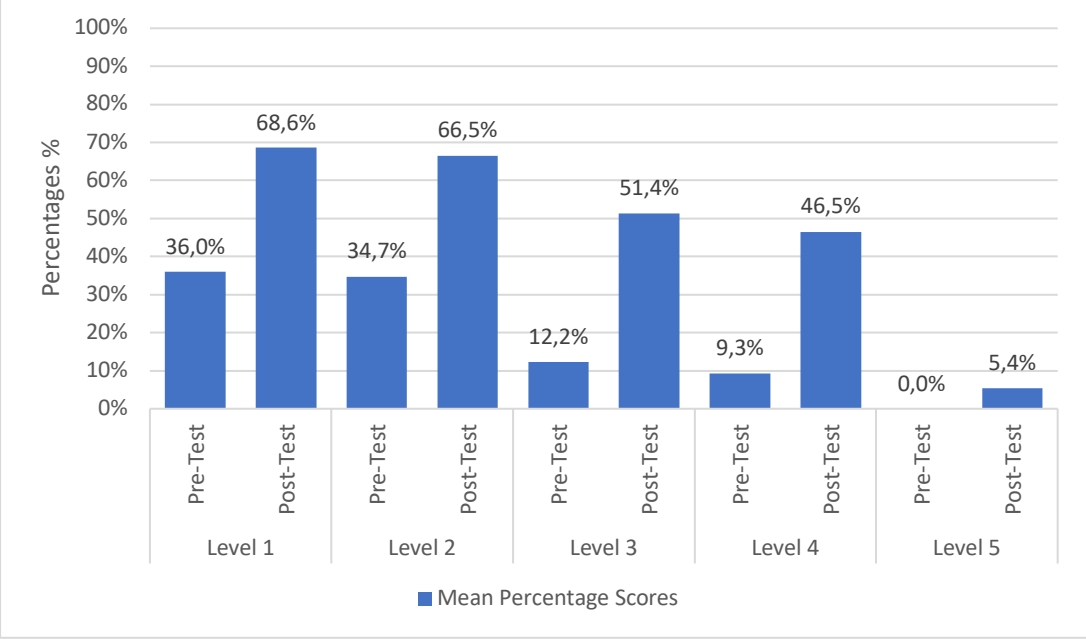


Figure 4. 15. Comparison of the Pre-post Results Emerged from the Logographic Reading Test

In the pre-test, the success rates ranged from a low of 0.0% at Level 5 to a high of 36.0% at Level 1. In the post-test, the success rates improved notably, ranging from 5.4% at Level 5 to 68.6% at Level 1. Specifically, at Level 1, the success rate increased from 36.0% to 68.6%, while at Level 2, it rose from 34.7% to 66.5%. The most remarkable progresses were observed at Levels 3 and 4. At Level 3, the success rate increased from 12.2% to 51.4%; at Level 4, it rose from 9.3% to 46.5%. At Level 5, while the pre-test success rate was 0.0%, it increased to 5.4% in the post-test. The bar graph reveals remarkable improvements in logographic reading skills, especially at Levels 3 and 4. The most minor progress was observed in Level 5, the most challenging level.

4.3. Findings from Environmental Print Learning Center Observations

The observations in this study examine various aspects of children's interactions and learning experiences at the environmental print (EP) learning center. The focus areas include weekly participation in the learning center, the distribution of logographic reading skills by level, and receptive and expressive skills regarding color and shape concepts. In this context, the observational findings contributed to the overall analysis by providing insights into several key areas: *(i)* weekly participation in the environmental print (EP) learning center, *(ii)* weekly distribution of the frequency of demonstration of logographic reading levels *(iii)* the weekly distribution of receptive and expressive skills on color and shape, *(iv)* the distribution of children's preferences for the EP learning center during free play, categorized by gender, *(v)* the average time spent (in minutes) in the EP learning center by gender, and *(vi)* the number of children whose receptive and expressive skills were observed, differentiated by gender. The findings from the EP learning center observations are designed to complement and enhance the overall results obtained from other instruments, such as logographic reading tests, checklists, and interviews. These combined insights aim to understand children's logographic reading and their receptive and expressive skills on colors and shape across multiple dimensions in the study. The findings related to gender are elaborated in detail in Section 0.

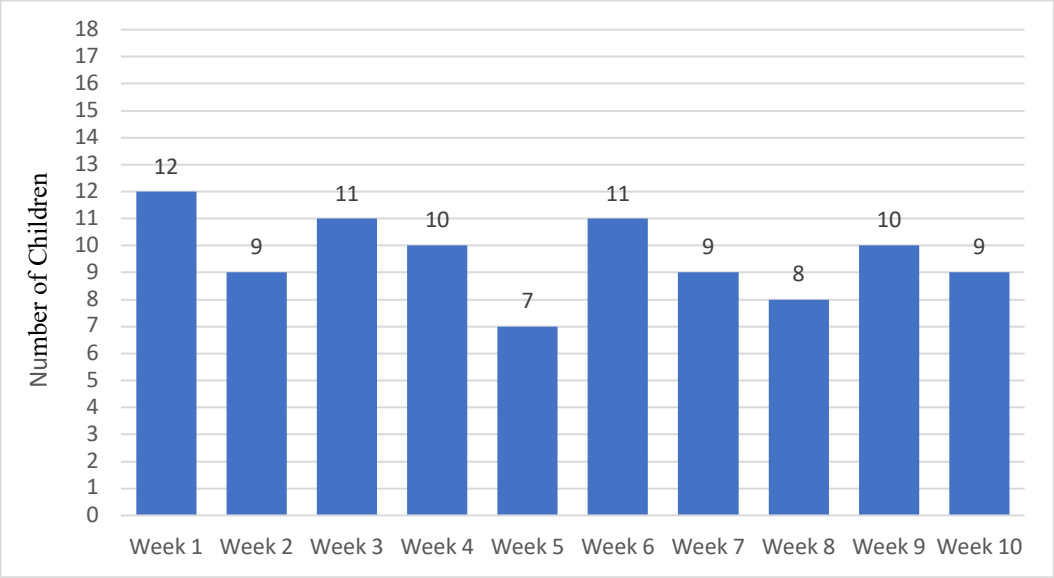
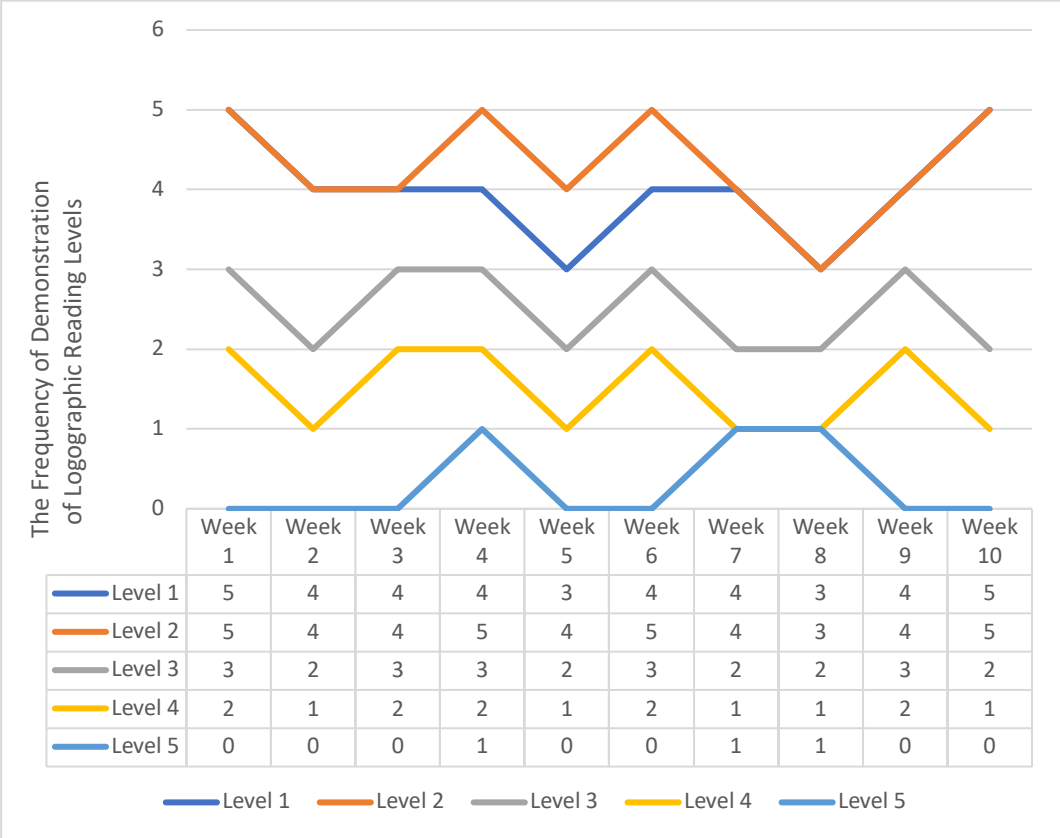


Figure 4. 16. Weekly Participation in the Learning Center

Figure 4.16 demonstrates the number of children participating in the Environmental Print (EP) learning center over ten weeks. The first week showed the highest participation, with 12 children participating in the activities in this learning center. A similar involvement was observed in the third and sixth weeks, with 11 children participating. Conversely, the fifth week marked the lowest participation, with only seven children engaging in the learning center activities. In other weeks, participation levels were relatively steady, varying between 8 and 10 children. This bar graph highlights how the EP learning center's attractiveness and the children's interest fluctuated over time. Furthermore, the variations in participation could be associated with specific activities (Mother's Day, national holidays) conducted during certain weeks or external factors.

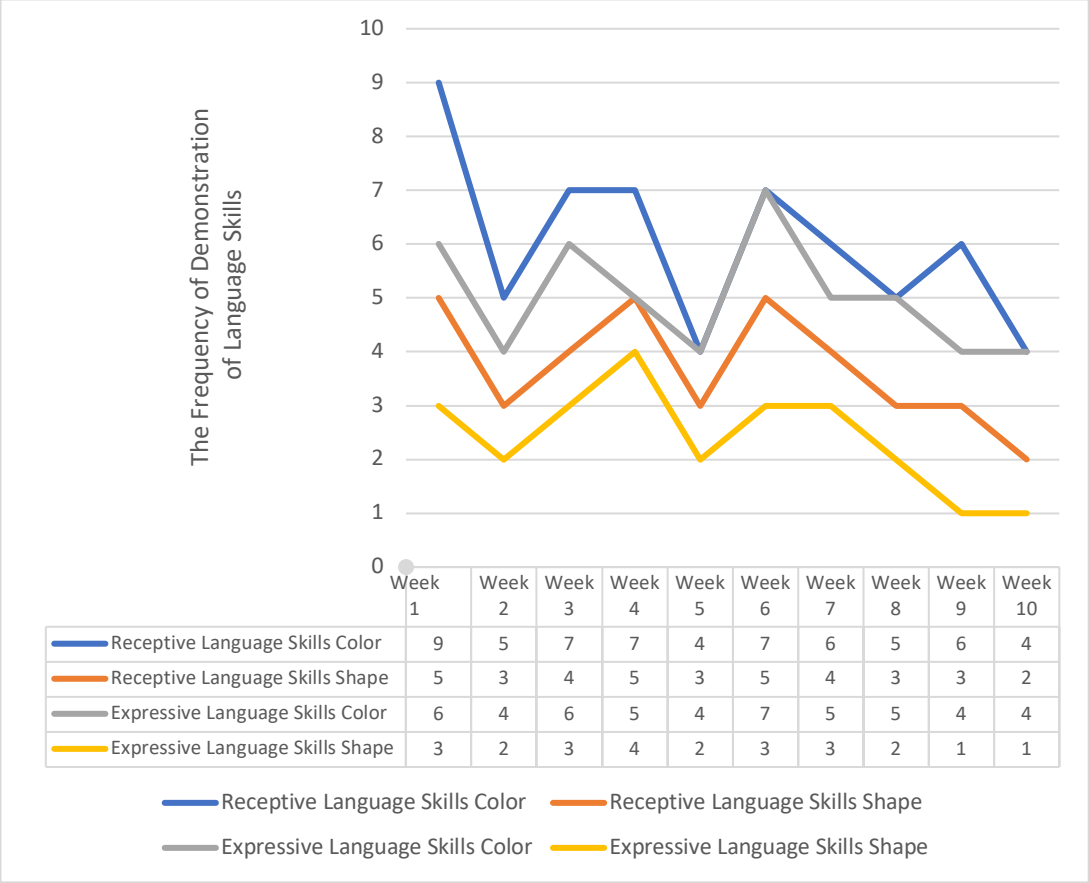


	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Level 1	5	4	4	4	3	4	4	3	4	5
Level 2	5	4	4	5	4	5	4	3	4	5
Level 3	3	2	3	3	2	3	2	2	3	2
Level 4	2	1	2	2	1	2	1	1	2	1
Level 5	0	0	0	1	0	0	1	1	0	0

Figure 4. 17. Weekly Distribution of the Frequency of Demonstration of Logographic Reading Levels

Figure 4.17 illustrates the frequency with which children demonstrated logographic reading skills at different levels across weeks. Each week shows the number of times

specific logographic reading levels were exhibited. Levels 1 and 2 were the most frequently demonstrated skills, particularly in Weeks 1 and 10, where these levels were shown five times each. Level 3 was typically demonstrated two to three times per week, indicating that while some children progressed to this intermediate level, it was less common overall. Level 4 was shown once to twice weekly, indicating fewer children reached this more advanced stage. Level 5, the most advanced level, was the least frequently exhibited, with no occurrences in most weeks and only a single demonstration in Weeks 4, 7, and 8. This finding shows that while children regularly exhibited easier-level logographic reading skills, the more advanced levels were less commonly demonstrated.



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Receptive Language Skills Color	9	5	7	7	4	7	6	5	6	4
Receptive Language Skills Shape	5	3	4	5	3	5	4	3	3	2
Expressive Language Skills Color	6	4	6	5	4	7	5	5	4	4
Expressive Language Skills Shape	3	2	3	4	2	3	3	2	1	1

Figure 4. 18. Weekly Distribution of the Frequency of Demonstration of Receptive and Expressive Skills on Colors and Shapes

Figure 4.18 indicates children's receptive and expressive skills during their interactions with environmental print (EP) in the prepared EP learning center during

free playtime each week. The line graph shows the weekly distribution of the frequency with which children exhibit these skills based on findings from the observation rubric. This provides a clearer view of how often children display their receptive and expressive skills on colors and shapes weekly and allows for better observation of their language skills.

Over ten weeks, this line graph illustrates the frequency with which children demonstrated receptive and expressive skills on colors and shapes across various sessions. Receptive skills for color were the most frequently observed, with 9 and 7 occurrences, respectively. Receptive skills for shape were observed less frequently, with the highest occurrence of 5 times in Weeks 1, 4, and 6. Expressive skills for color were consistently demonstrated, with the highest frequency of 7 occurrences in Week 6. However, expressive skills for shape were the least frequently observed, with the highest frequency being four occurrences in Week 4. These findings indicate that children's receptive and expressive skills related to color concepts were demonstrated more regularly than those about shape concepts throughout the sessions.

4.4. Children's Logographic Reading and Receptive, Expressive Skills Based on the Mother's Perspective

This section presents the findings from the interviews conducted with mothers. The first part outlines the findings from the pre-interviews, followed by the presentation of the findings from the post-interviews conducted after the implementation of the EP activities. Lastly, a comparison of the pre-and post-interview findings was provided. This section aims to offer a analysis of the changes in the data obtained from the interviews with mothers, highlighting the impact of the implementation process.

4.4.1. Pre-findings Emerged from the Mothers' Interviews

The pre-interviews with mothers aimed to uncover their perceptions and observations regarding their children's recognition of environmental prints (EP), receptive and

expressive skills, and concept knowledge in daily life. The interview comprised five questions to explore children's familiarity with EPs, such as logos and symbols. Mothers were asked to describe specific situations where their children recognized products based on EPs, including whether children could identify a milk carton with the name of the logo and associate it with milk or a beverage. Further questions examine if children could recognize logos in photographs, magazines, and newspapers and whether they could identify logos in black-and-white or plain text forms, reflecting varying levels of complexity in logographic reading.

The pre-interviews also focused on receptive and expressive skills related to EPs. Mothers were questioned on their children's ability to accurately identify colors and shapes associated with EPs when mentioned verbally. For instance, mothers were asked if their child could point out green in the PINAR logo during a conversation or identify and show a triangle shape within the EP based on verbal prompts. In this context, mothers were presented with scenarios to determine if their children demonstrated receptive and expressive skills concerning color and shape concepts. These detailed inquiries clearly understood the children's these skills to recognize and interpret environmental prints in their everyday environments.

At the beginning of the data collection process, the findings from the mothers revealed that they had varying levels of awareness about children's recognition of EPs and their impact on their children's receptive and expressive skills. Based on interviews with mothers, this initial data set provided a foundation for understanding children's basic perceptions and knowledge regarding their interactions with EPs. It serves as a basis for comparing pre- and post-implementation knowledge. Through the analysis process, main themes and sub-themes were identified from the pre-interviews.

The sub-themes associated with the first theme, "*Recognizing Environmental Prints,"* reflect a progression of children's recognition abilities across different levels. At the initial stage, Level 1, children can recognize environmental prints associated with the original product, enabling them to identify familiar products by recognizing the corresponding print. In Level 2, children can realize environmental prints when

presented with a colored photograph of the original product, showing their ability to associate the print with a visual representation. As they progress to Level 3, children can recognize environmental prints without the product being present, indicating their capacity to identify the print independently of the object. Finally, in Level 4, children can realize environmental prints in black-and-white formats, regardless of the environmental print's color or design elements.

The sub-themes related to the second theme, *"The Role of Environmental Prints on Receptive and expressive skills related to Colors and Shapes,"* focus on children's ability to recognize and demonstrate color and shape concepts within the context of receptive and expressive skills. The ability to recognize and name colors is assessed in terms of both receptive and expressive skills. Verbally identifying colors corresponds to receptive, while demonstrating colors when prompted reflects expressive skills. Similarly, children's ability to recognize and demonstrate shapes is also examined through the lens of receptive and expressive language skills development. Verbally identifying shapes indicates receptive skills whereas demonstrating shapes when presented is associated with expressive skills.

According to the findings obtained from the pre-interviews with mothers, the emerging themes and sub-themes are presented in Table 4.4.

Table 4. 4. Themes and Sub-themes that Emerged from the Pre-interviews of Mothers (N_M=18)

Themes	Sub-Themes	Explanations
Recognizing Environmental Prints	• Recognizing original products with EP (N_M=9) • Recognizing a colored photograph of the original product with EP (N_M=7) • Recognizing only the EP even without the product present (N_M=4) • Recognizing EP in black-and-white forms (N_M=2)	'*Recognizing original products with EP'* corresponds to **Level 1** '*Recognizing a colored photograph of the original product with EP'* corresponds to **Level 2** '*Recognizing only the EP even without the product present'* corresponds to **Level 3** *'Recognizing EP in black-and-white forms'* corresponds to **Level 4**

Table 4.4. (continued)

The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes	• The use of the ability to identify and demonstrate colors (N_M=7) • The use of the ability to identify and show shapes (N_M=5)	*Identifying colors verbally* refers to receptive skills *Demonstrating colors when prompted* refers to expressive skills *Identifying shapes verbally* refers to receptive skills *Showing shapes when presented* refers to expressive skills
Child Environmental Print Interaction	• The content of the child-EP interaction (N_M=5) • The frequency of the child-EP interaction (N_M=11)	

4.4.1.1. Subtheme 1: Recognizing Environmental Prints

In the pre-interviews, four main sub-themes emerged within the framework of the questions asked of the mothers to reveal their children's level of logographic reading skills. These sub-themes are recognizing original products with EP *(Level 1)* (N_M=9), recognizing a colored photograph of the original product with EP *(Level 2)* (N_M =7), recognizing only the EP even without the product present *(Level 3)* (N_M =4), and recognizing EP in black-and-white and plain text forms *(Level 4)* (N_M =2).

Half of the mothers (N_M =9) reported that their children could read the environmental print on the original product at a logographic level, specifically at Level 1.

> **M 12:** *My child loves to drink Coke. His father often bought either COCA-COLA or Pepsi for him. However, when my child saw a Pepsi bottle, (C12) would say, "I don't like that." (C12) then asked, "Why didn't you buy COCA-COLA?" (C12) not only recognized the cola but also identified the brand. (C12) knew the difference.*
>
> **M 7:** *When we were in the milk section of the supermarket, my child (C7) asked, 'Mommy, should we buy milk?' My child (C7) immediately recognized the milk we had bought before and drank it at home. (C7) pointed to the one with the blue lid and said, 'Mom, this is our DOST milk!*
>
> **M 17:** *(C17) loves to watch me while I cook. I even ask her to help me make a cake or something. My child (C17) immediately opens a fridge because (C17) has memorized how I do it. (C17) takes the ingredients one by one.*

For example, (C17) always calls the yogurt Danone... If you ask if (C17) can distinguish it from another yogurt box, I can say that (C17) can distinguish DANONE yogurt.

Recognizing a Colored Photograph of the Original Product with EP: Some mothers (N_M=7) reported that their children could recognize environmental prints on a colored photograph *(Level 2).*

M 2: *They left an A101 brochure on our doorstep the other day. There were discounts and other stuff, so I was checking them. The brochure is colorful. (C2) saw the DİDO juice can. My child (C2) immediately jumped and said, 'Mom, look, it's DİDO! I was surprised that my child (C2) recognized the photo my child (C2) saw there. We always buy for him when we go to the market, so I thought my child (C2) had memorized the name of the logo.*

M 10: *I put the old newspapers in front of her and gave her scissors to keep her occupied. I told her to cut as My child (C10) liked. Her eyes fell on an advertisement for Algida ice cream. There were a lot of colorful ice creams in the photo. My child (C10) was pleased, 'Mom, look! This is ALGIDA ice cream! Will you buy me some in summer? I asked her, 'Of course, but now shall we cut out this photo?' My child (C10) immediately agreed and started cutting out the photo. As my child (C10) was cutting out the images of the ice cream, my child (C10) distinguished the pictures by saying, 'This is vanilla, this is chocolate. Then, pointing to the ALGIDA logo, my child (C10) said, 'Mom, I know this sign. It's on the ice cream in the supermarket.*

Some of the mothers (N_M =4) stated that in terms of their children's skills of logographic reading of the environmental print on the original product (Level 1) or the color photographic image of the product (Level 2), their children could not read the name of the environmental print (EP), logo or brand. Still, they could tell what the product was. In other words, mothers stated that when their children see the EP or logo on the original product or see a photo of it, they may not be able to say the name of the EP directly, but they can often tell what the product is based on the context of the product.

M 5: *On Saturday evening, we wanted to order pizza. When I saw the DOMINO logo on the food basket in the phone application, my child (C5) immediately said, 'We are eating pizza.' I guess because (C5) sees the logo a lot on TV, in commercials, etc., my child (C5) can call it pizza as soon as (C5) sees it.*

> **M 14:** *Once, when we went to the chocolate section of a supermarket, my son ran straight to the ÜLKER chocolates section. For example, there was a big ÜLKER on it, but my son shouted, "Mom, chocolate!". Even though my child (C14) can't read the brand name, (C14) understands what it is when (C14) sees the shape of the package because the chocolate brand is familiar to him.*

A few mothers (N_M=4) specifically stated that their children could recognize the environmental prints at Level 3.

> **M 15:** *When we went to a mall, there was a giant McDonald's advertisement with just the emblem. (C15) immediately said, 'Mom, look, MCDONALD'S! Shall we have a hamburger? We usually eat at more affordable places, but every time my child (C15) sees the McDonald's symbol and a hamburger, my child (C15) recognizes it and wants it."*

> **M 11:** *For example, only A101 is written on the billboards outside. My child (C11) looks at it and tells me. Mom says let's go to A101 because there are discounts on toys.*

> **M 9:** *Recently, for example, my child (C9) was entering a shopping center parking lot when my child (C9) saw a big Ford billboard. It just said 'Ford' in the form of a logo. (C9) said, 'Mom, this Ford is like your car!' Since our car brand is also Ford, my daughter immediately recognized the brand logo and knew we were driving a Ford car.*

Only two mothers who participated in the study reported that their children were able to recognize environmental prints in black-and-white format, specifically at Level 4.

> **M 17***: ...is such a brand and a logo. We have never seen it in black and white with my child, but if my child (C17) sees it, my child (C17) will say it. If it is a brand that my child (C17) knows the color version of, my child (C17) knows the black-and-white version.*

> **M 3:** *I'm not sure, but if you say colorless version.....hmm, I think C3 would say it because if it's a brand my child (C3) likes and uses, my child (C3) would say its name.*

4.4.1.2. Subtheme 2: The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes

In the pre-interviews, the mothers (N_M=18) were asked questions to reveal their children's receptive and expressive skills, and various findings were obtained. In

this context, two sub-themes emerged, including the ability to identify *(receptive skills)* and show *(expressive skills)* colors (N_M =7) and the ability to identify *(receptive skills)* and show *(expressive skills)* shapes (N_M =5).

Some mothers (N_M =7) who participated in the study claimed that their children indicated receptive and expressive skills regarding color.

> **M 1:** *My child (C1) loves ALGIDA. (C1) once told his sister that when (C1) took the ice cream, look red and white, like our flag...*
>
> **M 13:** *When we are in our car, I make him play games like finding things we see around us so that (C13) doesn't look at a phone. For example, when we try to find blue, (C13) points to the blue color on the A101 logo and says, "I found blue!".*
>
> **M 18:** *(C18) recognizes a brand logo of the factory where I work, and when my child (C18) sees it, my child (C18) says the name of the logo. The sweatshirt I wear to the factory has the same logo on it. We laughed a lot the other day. My child (C18) asked if you wear red because I work at BIM.*

When mothers were asked which colors their children could recognize (receptive skills). Whether they could name the colors (expressive skills), it was reported that most children (N_M = 15) could recognize and name the color shown. Only three mothers (N_M = 3) mentioned that their children sometimes struggled to name specific colors when asked.

> **M 8:** *Every month, we receive newsletters from the school, i.e., what concepts are being taught that month. The teacher also writes game suggestions in the bulletin to reinforce them. I play games at home to support my child, such as finding what C8 has learned from the items in the house. It doesn't take very long, and the attention span is low, but I can say this: my child (C8) easily recognizes all colors. If you ask her, my child (C8) will tell you the name of the color.*
>
> **M 16:** *If you ask him for most colors, my child (C16) will show you and name them, but I think my child (C16) confuses some colors. For example, my child (C16) was confused about gray and orange the other day. .... When my child (C16) explained his painting, my child (C16) called it orange or gray. I asked him several times, but my child (C16) confused them.*

In the interviews with mothers, they were generally asked whether their children knew specific shapes regarding receptive and expressive skills. Most mothers (N_M

=10) stated that their children could understand all shapes. However, seven mothers (N_M=7) reported that while their children could recognize some shapes when asked, they occasionally struggled to identify and name specific shapes.

> **M 17:** *I think my child (C17) recognizes all the shapes because if my child (C17) learned a shape at school that day, my child (C17) always comes home and shows that my child (C17) has learned it. .... Hmmm, so I think my child (C17) can say the name of the shape even if I show her the shape.*
>
> **M 10:** *I started teaching my daughter the shapes when my child (C10) was a baby, and now my child (C10) reinforces them at school because her teacher teaches her. So yes, C10 knows all the shapes and can name them when shown.*
>
> **M 12:** *(C12) knows all the shapes. Because (C12) teaches her brother the shapes, my child (C12) learned at school. My child (C12) has a 3-year-old brother, and my child (C12) makes him a student and plays a teacher. From what I saw, my child (C12) was doing it.*
>
> **M 13:** *Based on my observations, C13 was confusing round and oval shapes. I tried to explain the difference a few times, but my child (C13) still confused them.*
>
> **M 5:** *(C5) knows all the shapes, but sometimes my child (C5) can confuse square, rectangle, circle, and oval shapes. I guess we can't say that my child (C5) knows it entirely in this case...*

4.4.1.3. Subtheme 3: Child Environmental Print Interaction

In the pre-interviews with the mothers, various findings were obtained regarding the content and frequency of their children's interactions with environmental prints (EPs). In this context, the sub-themes that emerged were the frequency of the child-EP interaction (N_M =11) and the content of these interactions (N_M =5).

Most mothers (N_M =11) stated that their children mostly interacted with environmental prints (EPs). In this context, mothers (N_M =5) reported that when their children were exposed to EPs, they tended to initiate conversations about it. It was found that all the conversations about this interaction were related to logographic reading proficiency, i.e., what the name of the EP was that attracted the children's attention.

M 11: *Ever since (C11) was little, my child (C11) always asks me about writing that interests her. But when I say writing, for example, I don't mean plain writing, but things like brands, emblems, or traffic signs. For example, the brand on the drink my child (C11) likes. When my child (C11) drinks milk, my child (C11) asks me what it says on the carton.*

M 18: *As my child (C18) gets older, I think my child (C18) gets more interested in the written things around him. My child (C18) is not interested in plainly written things, but logos and things like that are fascinating. For example, in a pizza shop, mom can ask many questions about what is written and what is written here.*

M 15: *I mean, it doesn't happen very often, but sometimes when we go to the grocery store, Mom asks what's written here. If it's something my child (C15) likes, my child (C15) asks.*

M 2: *I can say that the things that interest my son the most are traffic signs. For example, (C2) saw a traffic sign on the side of the road. My child (C2) usually asks his father or me what it says here or what this sign means.*

M 13: *Outside, for example, the logos on the advertisements on these big billboards (C13) often asks me, "Mom, what does it say here?" and my child (C13) tries to find it out.*

4.4.2. Post-findings Emerged from the Mothers' Interviews

According to the post-interview findings, four key themes emerged: Recognizing Environmental Prints, The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes, Child Environmental Print Interaction, and Perceptions of Children's Learning Outcomes. The sub-themes related to the first theme, "*Recognizing Environmental Prints,"* focus on developing children's recognition abilities at different levels. Starting from Level 1, where children recognize environmental prints when associated with the original product, they progress through levels indicating their ability to identify prints independently, regardless of color or design, and even in plain text form at the most advanced stage, Level 5.

The sub-themes under the second theme, *"The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes,"* focus on children's recognition and demonstration of color and shape concepts within the context of

receptive and expressive skills. It assesses the ability to recognize and name colors regarding receptive and expressive skills. Verbally identifying colors reflects receptive skills, while demonstrating colors when prompted corresponds to expressive skills. Similarly, the study examines children's ability to recognize and demonstrate shapes through the lens of receptive and expressive language development. Verbally identifying shapes is linked to receptive skills, while demonstrating shapes when presented is associated with expressive skills. The theme "*Child Environmental Print Interaction"* highlights the content and frequency of children's engagement with EP, displaying that both the quality and quantity of this engagement play a crucial role in their development. The theme "*Perceptions of Children's Learning Outcomes"* also reflects mothers' observations regarding their children's growing ability to recognize EP at different logographic reading levels, increased interest in EP, and enhanced enthusiasm for identifying and demonstrating colors and shapes in everyday contexts. Furthermore, mothers noted an increase in their children's motivation to learn letters and sounds, emphasizing the impact of EP activities on emergent literacy skills.According to the findings obtained from the post-interviews with mothers, the emerging themes and sub-themes are presented in Table 4.5.

Table 4. 5. Themes and Sub-themes that Emerged from the Post-interviews of Mothers (N_M =18)

Themes	Sub-Themes	Explanation
Recognizing Environmental Prints	• Recognizing original products with EP (N_M =18)	'*Recognizing original products with EP'* corresponds to **Level 1**
	• Recognizing a colored photograph of the original product with EP (N_M =17)	'*Recognizing a colored photograph of the original product with EP'* corresponds to **Level 2**
	• Recognizing only the EP even without the product present (N_M =14)	'*Recognizing only the EP even without the product present'* corresponds to **Level 3**
	• Recognizing EP in black-and-white and plain text forms (N_M =6)	*'Recognizing EP in black-and-white forms'* corresponds to **Level 4**
	• Recognizing EP in plain text forms (N_M =1)	*'Recognizing EP in plain text forms'* corresponds to **Level 5**

Table 4.5. (continued)

The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes	• The use of the ability to identify and show colors (N_M =13) • The use of the ability to identify and show shapes (N_M =11).	*Identifying colors verbally* refers to receptive skills *Demonstrating colors when prompted* refers to expressive skills *Identifying shapes verbally* refers to receptive skills *Showing shapes when presented* refers to expressive skills
Child Environmental Print Interaction	• The content of the child-EP interaction (N_M =16) • The frequency of the child-EP interaction (N_M =17)	
Perceptions of Children's Learning Outcomes	• Recognizing environmental print at various logographic reading levels (N_M =16) • Increasing interest in environmental prints (N_M =14) • Increasing desire to identify and demonstrate colors and shapes in daily lives (N_M =13) • Increasing motivation for learning letters and sounds (N_M =11)	

4.4.2.1. Subtheme 1: Recognizing Environmental Prints

All the mothers (N_M =18) reported that their children could easily recognize environmental prints (EP) on the original products. Many mothers (N_M =17) indicated that their children could recognize EP from photographs of the original products. Fourteen mothers (N_M =14) mentioned that their children could recognize EP without the presence of the product. Some mothers (N_M =6) also noted that their children could recognize logos even when devoid of product context and color cues. Only one mother (N_M =1) stated that her child could occasionally recognize the logo in plain text form.

> **M 7:** *I observe that (C7) is more careful in the supermarket. Some supermarkets have a section with toys or stationery and stuff like that. (C7) bought glue there to show me. My child (C7) said, "Mom, I'll tell you what it*

says here. My child (C7) said "PRITT," and I was shocked. I even thought my child (C7) had learned to read.

M 8: *Now I see this a lot in (C8); for example, when my child (C8) sees the brands you make in your lessons, my child (C8) immediately shows them to us. In the advertisement, there is ÇİLEK children's room, and my child (C8) immediately says Mom, I know this; it says ÇİLEK here.*

M 15: *I think you leave the things you use in activities in the classroom for the children to play with later. My child (C15) brought home a coloring page with the LOL doll logo in black and white. For example, there were no colors. My child (C15) even brought it home for me to color at home. (C15) is called the colorless version, LOL baby. My child (C15) also brought other black and white things printed with brands and colored them, but I can't remember now. But my child (C15) knew what it said.*

4.4.2.2. Subtheme 2: The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes

Most mothers (N_M =13) reported that their children could easily identify colors verbally, demonstrating receptive skills, and could show colors when prompted, reflecting expressive skills.

M 4: *Approximately two or three weeks after we met, I witnessed something during shopping. There were TRT Çocuk magazines near the checkout counters. For example, my son pointed out a star from TRT Çocuk to me there. He said, "Mom, look, there's a star here. Now you find a shape from here, too."*

More than half of the mothers (N_M =11) indicated that their children could recognize shapes verbally and name those shapes.

M 18: *I don't know if what you are saying makes sense, but for example, a logo that you see at home, for example, we call it Danone Styles, and Danone is written there, so (C18) does the same as (C18) does the picture, (C18) emphasizes the shapes there. For example, (C18) tells his brother, 'Look, there was this shape here.'*

M 6: *If you had asked me this before, which you did, I would have said that (C6) seemed to have problems with colors other than the primary colors. Now, I can say that I have never witnessed her confusing colors like my child (C6) used to.*

M 7*: While we were walking around the shopping mall, my daughter said something like this: You know, there is a ÇİLEK Room, and it has a logo shaped like a strawberry. She pointed to the circles inside the ÇİLEK logo and said, "Mom, let's try to guess how many circles are inside." We talked about it like that.*

M 17: *I can easily say that (C17) knows and recognizes the shapes without confusing them. My child (C17) may have some difficulty with circles and ovals. I'm not sure, but my child (C17) knows all of them except these two shapes.*

4.4.2.3. Subtheme 3: Child Environmental Print Interaction

Based on mothers' perceptions, two subthemes emerged under the broader theme of child-EP interaction: the content of the child-EP interaction and the frequency of these interactions. The mothers (N_M =16) who commented on the content of child-EP interaction noted that their children's engagement with environmental print initially focused on familiar brands. However, as the children's exposure to environmental print increased, their curiosity extended to a broader range of brands and logos. Mothers further observed that these interactions evolved beyond mere logo recognition to include the exploration of elements such as colors and shapes. Regarding the frequency of child-EP interactions, mothers (N_M =17) reported that their children's engagement with environmental print intensified over time.

Additionally, children began to share their knowledge of environmental print, particularly with siblings. According to the mothers, as the children's curiosity increased, the frequency of their interactions with environmental print also grew. Direct quotations from the mothers are provided below.

M 12: *Especially at the mall, (C12) started asking about everything my child (C12) saw. For example, we go to eat. Mom asks what it says here if my child (C12) doesn't know, but if my child (C12) does, my child (C12) says the colors in the brand and tries to find a shape in it. It had never been this much before.*

M 6: *(C6) surprises us a lot. For example, I have a son one year younger than her. For example, (C6) always shows him the logos. If (C6) doesn't know the logo, my child (C6) asks us the meaning and learns. If my child (C6) understands the logo, my child (C6) already says it. But now my child*

(C6) also explains to her brother what shapes are there. Then my child (C6) finds the shapes on it herself and tries to get her brother to find them too.

4.4.2.4. Subtheme 4: Perceptions of Children's Learning Outcomes

In the post-interview with the mothers, the sub-theme '*Perceptions of Children's Learning Outcomes'* emerged, which differed from the pre-interview. These sub-themes are recognizing more environmental prints at various logographic reading levels (N_M=16), increasing interest in environmental prints (N_M=14), increasing desire to identify and demonstrate colors and shapes in daily lives (N_M=13), and increasing motivation for learning to use letters and sounds (N_M=11).

Through the additional questions in the post-interview interviews, the mothers were asked whether the EPs activities implemented by their children resulted in a change in their children. Most mothers (N_M =16) reported an increase in their children's logographic reading skills. Furthermore, they (N_M =14) claimed that their children showed increased interest in EPs. Most of the mothers (N_M =13) also reported that their children talked about the colors and shapes in the EPs and explored these concepts in the EPs. Some mothers (N_M =11) claimed their children's motivation to learn letters and sounds increased. In this context, the children's learning outcomes that the mothers observed in their children and thought to be related to the activities implemented are explained in direct quotations below.

M 7: *(C7) can now say brands and logos I never knew my child (C7) knew. I think my child (C7) probably learned from your activities. My child (C7) even read what was written on the crayon. For example, my child (C7) said "FATİH," which is not exactly a logo. It is written in writing there. But my child (C7) still understands and says it.*

M 10: *(M17) is my best friend. We went to the market the other day after school when we picked up the girls, and the two of them held hands, found the logos and brands in the market, showed them to us, and read them. If they didn't know, they would come up to us and ask. So, they were both very interested in the logos...*

M 14: *Before, there were logos my child (C14) knew, but now (C14) knows and shows me much more. Especially if we go to the market, my child (C14) searches like a detective to show me what my child (C14) knows.*

M 9: *Before, for example, my child (C9) used to ask Mom about the logos, brands, etc. that my child (C9) saw around him, but now my child (C9) can say, Mom, look, there is a rectangle on this. I didn't even understand. I asked her where it was. You won't believe it; my child (C9) showed me the rectangle in the tiny place inside the logo.*

M 3: *For example, we were going to the park the other day. Before we went, we went to the market and bought ice cream. There, for example, M3 immediately shouted that it says Algida here. My child (C3) said, "Mom, does ALGİDA start with A, just like my name?*

M 4: *This happened yesterday; (C4) was watching TRT ÇOCUK, her favorite cartoon. Mom, did you know what it says here, my child (C4) said, showing me the TRT ÇOCUK logo. I said I didn't know either. My child (C4) said here it says TRT ÇOCUK. My child (C4) asked me what else starts with T. Then we tried to find them together.*

4.4.3. Comparison of the Findings of Pre-Post Interviews with Mothers

In this section, the findings of pre- and post-interview with the mothers are compared. The subthemes that emerged in both interviews are presented through graphs and corresponding explanations. Direct quotations from the mothers regarding these subthemes are also included to support the findings.

4.4.3.1. Subtheme 1: Recognizing Environmental Prints

For the first subtheme, comparing pre-post-interview findings indicated increased children's logographic reading skills across all levels. A greater number of mothers reported that their children successfully read environmental print at each level, reflecting an improvement from the pre-test results. Furthermore, a new outcome was observed that had not been present in the pre-test: one mother reported that her child could now read environmental print in plain text form (Level 5).

According to the findings from the interviews conducted with the mothers, an increase in children's recognition of environmental prints and logographic reading skills was observed at all levels.Figure 4.19 illustrates a comparative analysis of pre- and post-interview findings: children's recognition of environmental print across different levels, as reported in the interviews with the mothers. The mothers

indicated that this increase was particularly evident when environmental prints were presented in context, with nearly all children succeeding at Level 1 and 2. In other words, the mothers noted that more children demonstrated logographic reading competence when the environmental prints were presented on the original products, making this improvement more apparent than the pre-test results.

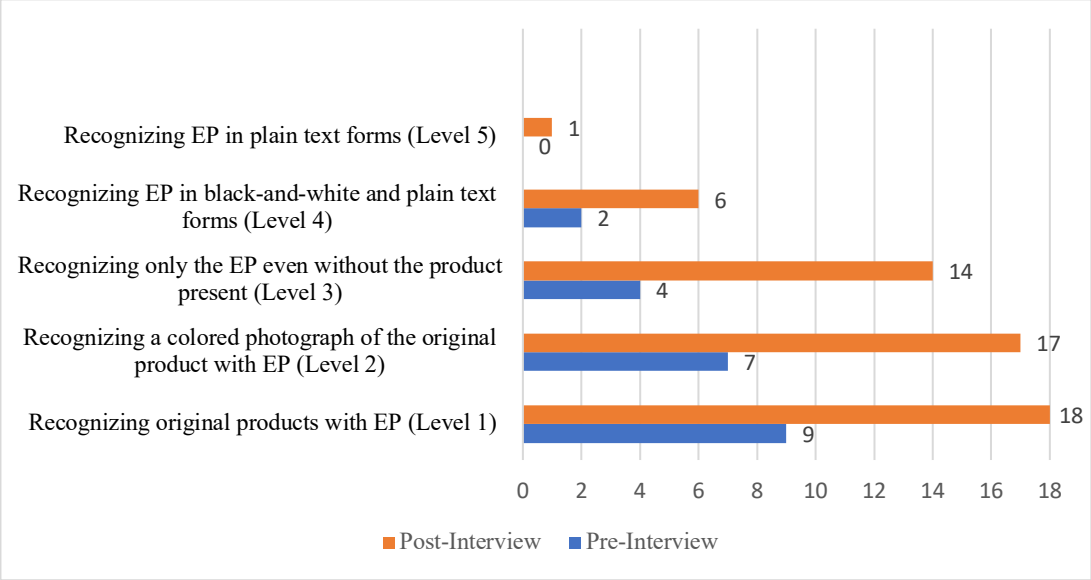


Figure 4. 19. Comparison of Pre- and Post-Interview Findings: Children's Recognition of Environmental Print across Different Levels

A similar increase was observed in children exposed solely to environmental prints without color photographs and products (Level 3). Specifically, the number of children exposed to black-and-white environmental prints who exhibited logographic reading skills increased, as reported by the mothers in the post-interview (Level 4). However, this increase involved less than half of the children participating in the study. Furthermore, in the plain text formats (Level 5), only one child could read the environmental prints logographically, according to the mothers' reports.

> **M 17:** *I can say that (C17) has become more familiar with logos. Whether at home, in the market, or at the shopping mall, I notice that (C17) is now naming many logos. (C17) mentions things I thought (C17) never paid attention to. For example, yes, (C17)'s room is from Çilek, but how does (C17) know that it says Çilek there? I don't know if you use it in your activities, but that has been there since (C17) was born. Now, however, it has*

caught (C17)'s attention, and (C17) has started reading it when (C17) sees it. Something happened recently that I would like to share with you. A Çilek emblem was on the tag of (C17)'s blanket. Of course, it's not colorful; it's written with silver thread. But (C17) can point at it and say it's Çilek.

4.4.3.2. Subtheme 2: The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes

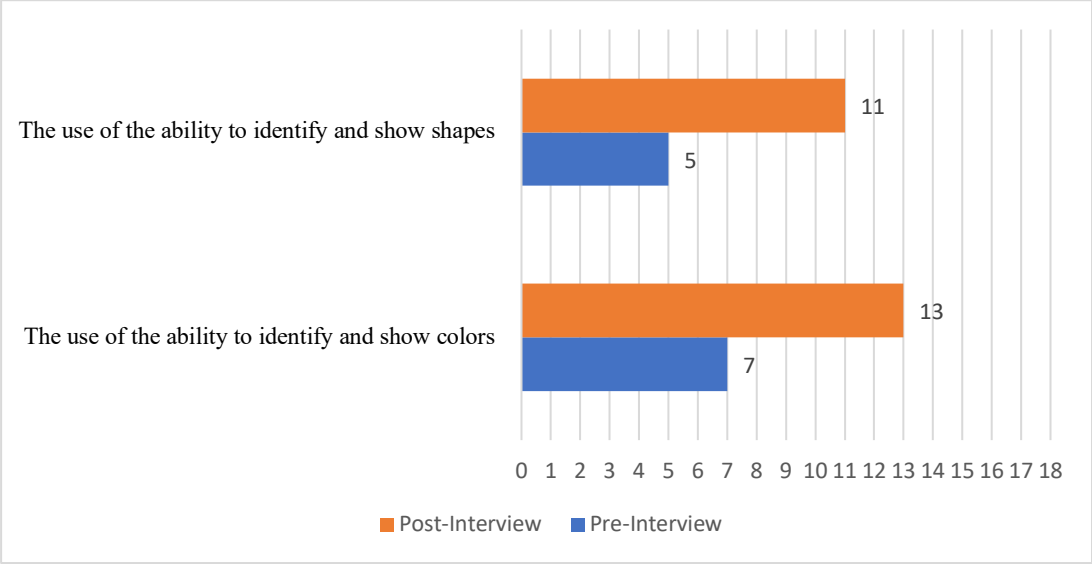


Figure 4. 20. Comparison of Pre- and Post-Interview Findings: Children's Use of the Ability to Identify and Show Shapes and Colors

Figure 4.20 compares pre- and post-interview findings: children's use of the ability to identify and show shapes and colors. This graph illustrates the observed changes in children's ability to identify colors and shapes (receptive skills) and to demonstrate these elements (expressive skills). The post-interview findings indicate that more mothers observed these abilities in their children compared to the pre-interview results. Regarding the ability to identify and show shapes, the post-interview revealed that mothers (N_M =11) reported their children could effectively utilize this skill. In contrast, some mothers (N_M =5) had noted this in the pre-interview. This displays a notable improvement in children's receptive and expressive skills.

Regarding identifying and showing colors, mothers (N_M =13) in the post-interview stated that their children demonstrated this ability, compared to only (N_M =7)

mothers in the pre-interview. This increase highlights children's receptive and expressive skills development, potentially influenced by their interactions with environmental print. The direct quotations of mothers on this theme are presented below.

> **M 10:** *Sometimes (C10) I couldn't remember or confused colors, but now I think my child (C10) doesn't have such a problem. I even ask her which color is this and which color is that. My child (C10) answers quickly without confusion.*
>
> **M 1:** *I told you in our previous interview that my child (C1) confuses shapes that are close to each other, like a square with a rectangle or an oval with a circle. I think (C1) doesn't confuse this anymore because if (C1) comes across, for example, the brand of a product (C1) likes, (C1) says the shapes in that brand. Honestly, I have never seen him make a mistake while saying it.*
>
> **M 16:** *For example, I had never seen (C16) talking about a logo or a brand before specifically. Now, primarily through the logos in your EP activities, my child (C16) always says, look, Mom, there is this color, there is that color. This surprised me a lot.*

4.4.3.3. Subtheme 3: Child Environmental Print Interaction

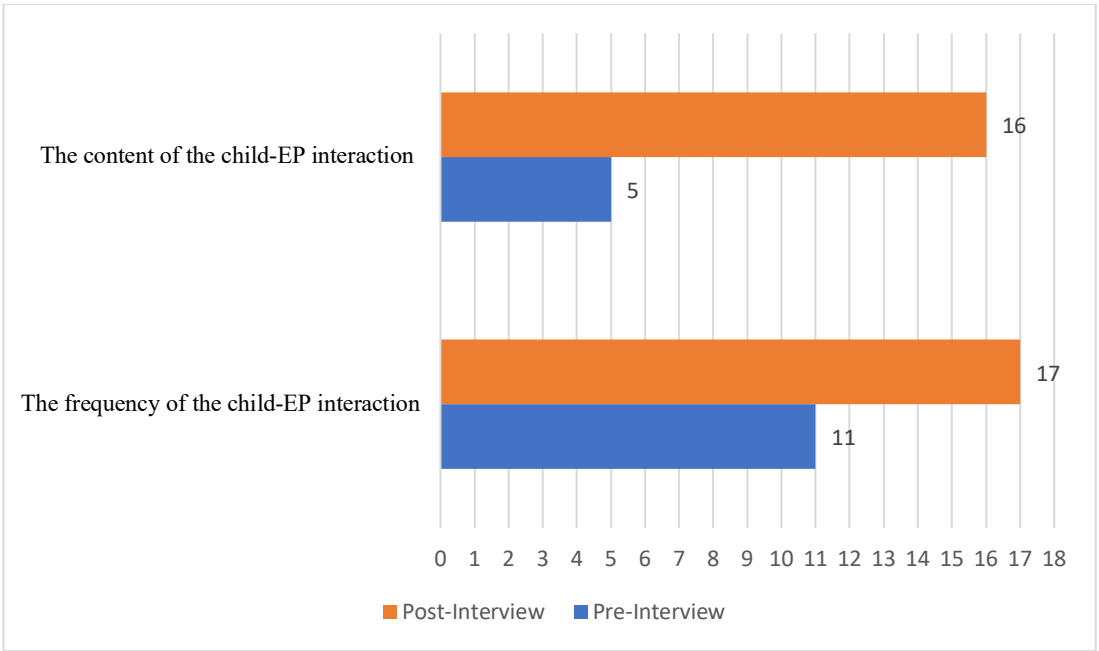


Figure 4. 21. Comparison of Pre- and Post-Interview Results: The Content and Frequency of Children's Interaction with Environmental Print

As shown in Figure 4.21, this comparison of pre-and post-interview findings is based on the reports provided by the mothers regarding the frequency and content of their children's interactions with environmental print (EP). According to the comparison of the findings, there was a notable increase in the frequency of children's engagement with EP. Many mothers (N_M =11) initially reported that their children frequently interacted with EP, but this number rose to 17 mothers (N_M =17) in the post-interviews. Similarly, the variation in these interactions demonstrated considerable growth. In the pre-interview, five mothers (N_M =5) indicated that their children engaged with EP in a varied manner, whereas this number increased to 16 mothers (N_M =16) by the time of the final interviews.

> **M 20:** *In the past, my child (C1) only recognized and questioned the brands they liked. Now, (C1) questions almost every brand and logo. For example, (C1) pointed out what is written here or told us what they learned from your activities.*

Moreover, in the findings of the observations of the mothers in the post-interview, unlike in the pre-interview, it was revealed that in children's interactions with EPs, children did not only focus on what the name of the EP and colors of EPs were but also frequently talked about the EP in terms of finding the shapes it contained graphically.

> **M 11:** *We experienced something like this. My child said, 'Mom, there is a triangle in A101. Did you know that?' At first, the idea of a triangle in A101 didn't make much sense. But then, when we went outside, my child pointed to the emblem of the A101 market and showed me the triangle inside the 'A.' I was surprised by that. Honestly, this was something we had never experienced before.*

4.4.3.4. Subtheme 4: Perceptions of Children's Learning Outcomes

In the post-interview with the mothers, the sub-theme *'Perceptions of Children's Learning Outcomes*' emerged, which differed from the pre-interview. These sub-themes recognize more environmental prints at various logographic reading levels, increase interest in environmental prints, increase the desire to identify and demonstrate colors and shapes daily, and increase motivation for learning letters and sounds.

Through the additional questions in the post-interview interviews, the mothers were asked whether the EPs activities implemented with their children resulted in a change in their children. Most mothers (N_M =16) reported an increase in their children's logographic reading skills. Furthermore, they (N_M =14) claimed that their children showed increased interest in EPs. Most of the mothers (N_M =13) also reported that their children talked about the colors and shapes in the EPs and explored these concepts in the EPs. Some mothers (N_M =11) claimed their children's motivation to learn letters and sounds increased. In this context, the children's learning outcomes that the mothers observed in their children and thought to be related to the activities implemented are explained in direct quotations below.

> **M 13:** *So, when I compare it to the previous situation, I can actually say this: Before, yes, (C13) would ask questions when (C13) saw logos around them. Now, (C13) asks much more frequently, but what really catches my attention is that (C13) is now asking, 'Mom, what letter does this logo start with?' (C13) is trying to learn those things.*

4.5. Children's Logographic Reading and Receptive, Expressive Skills Based on the Classroom Teacher's Perspective

The interviews with the class teacher aimed to demonstrate perspectives on children's logographic reading and receptive, expressive skills on color and shape in educational settings. This data is crucial as it provides a professional perspective and allows the teacher to observe potential changes in the children before and after the implementation. The teacher's observations are particularly valuable in identifying how children's recognition and understanding of environmental print evolve through the implementation at school, offering a more nuanced interpretation of the data.

4.5.1. Pre-findings Emerged from the Teacher's Interview

Pre-interview questions focused on the teacher's thoughts regarding emergent literacy and environmental print awareness of the children who participated in the current study. The teacher was asked when they believe children first become aware of EP and why they think this occurs. The teacher also discussed whether this awareness develops independently or with adult assistance. Additionally, the teacher

was asked about the potential for using EPs like logos, symbols, and emblems as educational tools in the classroom and whether they had previously incorporated such elements into their teaching practices. She provided insights into how these EPs could support various developmental areas. The subsequent questions explored the teacher's observations of the children's ability to recognize and name products based on logos and symbols in multiple contexts. These questions examined the children's proficiency in logographic reading through different forms of EPs: recognizing products in their environment *(Level 1),* identifying EPs in photographs or advertisements *(Level 2),* understanding EPs without the product present *(Level 3),* recognizing black-and-white Eps *(Level 4),* and identifying EPs in plain text form (*Level 5),* Also, open-ended questions were specifically prepared for the educational setting to explore the children's receptive and expressive skills. This adaptation involved rephrasing questions about colors and shapes to suit classroom scenarios, facilitating a focused exploration of how children comprehend *(receptive skills)* and verbally express these visual elements *(expressive skills).* These questions were used to determine whether children could accurately identify and show specific colors and shapes upon verbal requests, such as pointing out green or identifying a triangle in a familiar logo. Additionally, questions were used about whether children discussed these visual elements during their play with peers, specifically if they mentioned colors and shapes from logos while interacting in play settings.

Based on the findings from the pre-interview with the teacher, the emerging themes and sub-themes are displayed in Table 4.6.

Table 4. 6. Themes and Sub-themes that Emerged from the Pre-interview of the Teacher

Themes	Sub-Themes	Explanations
The Perspective of Emergent Literacy and EPs	• Knowledge of Emergent Literacy, EP, and EP Practices • The relationship between EP and children's developmental areas	

Table 4.6. (continued)

Recognizing Environmental Prints	• Recognizing original products with EP • Recognizing a colored photograph of the original product with EP • Recognizing only the EP, even without the product present • Recognizing EP in black-and-white and plain text forms	'*Recognizing original products with EP'* corresponds to **Level 1** '*Recognizing a colored photograph of the original product with EP'* corresponds to **Level 2** '*Recognizing only the EP even without the product present'* corresponds to **Level 3** *'Recognizing EP in black-and-white forms'* corresponds to **Level 4**
The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes	• Ability to identify and show colors • Ability to identify and show shapes	*Identifying colors verbally* refers to receptive skills *Demonstrating colors when prompted* refers to expressive skills *Identifying shapes verbally* refers to receptive skills *Showing shapes when presented* refers to expressive skills
Children's Environmental Print Interaction	• The content of the children-EP interaction • The frequency of the children-EP interaction	

4.5.1.1. Subtheme 1: The Perspective of Emergent Literacy and Environmental Prints

The '*Perspective of Emergent Literacy and environmental prints (EPs)*' theme comprises the sub-themes of knowledge of emergent literacy, EP, and EP practices, and the relationship between EP and children's developmental areas. The teacher

expressed that the concept of emergent literacy evokes thoughts of specific developmental domains and children's levels of understanding in these areas. Additionally, she claims that emergent literacy involves cognitive and language development skills. According to the teacher, awareness of environmental prints (EPs) starts around the age of three and can be further developed with support from parents. In class, traffic signs have been utilized in activities to incorporate EPs. The class teacher claims that integrating EPs in the classroom supports cognitive and language development in children.

> **T:** *When I think of early literacy, I think of the child's cognitive and language development, cognitive level, and success levels in shapes and numbers.*
>
> **T:** *From age 3, I think children's awareness of everything that happens to visual stimuli starts to develop; I think it will develop if the family supports it. It is not something that will develop spontaneously in the child.*
>
> **T:** *Since the beginning the semester, we have been studying traffic signs. We have learned what each traffic sign means, but apart from that, we have not done any activity with any visual stimulus, logo, or brand. More precisely, I have no idea how it can be used.*
>
> **T:** *Again, it aligns with the developmental areas where emergent literacy is supported. In other words, children's cognitive and language development can be supported in the classroom when activities are carried out using visual stimuli.*

4.5.1.2. Subtheme 2: Recognizing Environmental Prints

This '*Recognizing Environmental Prints'* theme comprises the following sub-themes: Recognizing original products with environmental prints (EPs), recognizing a colored photograph of the original product with EPs, recognizing only the EP even without the product present, and recognizing EPs in black-and-white and plain text forms. According to the pre-interview findings with the classroom teacher, the teacher reported that more than half of the children could logographically read EPs when these are on the original products (Level 1) or depicted in colored photographs (Level 2) of these products. The teacher also noted that if only a logo is displayed without the context of the original product (Level 3), only 3 to 4 students in the class can demonstrate logographic reading proficiency. Furthermore, if the EP is presented

in a black-and-white format without color cues (Level 4), only about 1 or 2 children might show logographic reading proficiency. Lastly, the teacher stated that there would not be any child who could tell what the written expression was from the plain writing form of the EP (Level 5).

> **T:** *In the classroom, I believe some children are proficient in this area, meaning they have highly developed visual perception. For instance, many children can see the brand name 'PRITT' on a glue stick and correctly identify it as 'PRITT.'*
>
> **T:** *If you remove color cues from logos, the situation changes. Then, I doubt they could tell you what is written there. Perhaps only one or two children could say it, but certainly not more.*
>
> **T:** *No one in our class can read a plain text version because that requires direct reading ability.*

4.5.1.3. Subtheme 3: The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes

The theme *'The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes'* comprises sub-themes focused on the ability to identify and demonstrate colors and shapes. In this context, the teacher has observed that while there isn't extensive discussion among children about the colors in environmental prints, such discussions occur occasionally. However, discussions about the shapes in environmental prints are less frequent than those about colors.

> **T:** *After the activities we conducted on traffic signs, we placed these signs in a corner of the classroom. For example, some children would draw pictures of those traffic signs by looking at them. Most of the time, even a few children would come together. There, for example, they would first draw a circle with a red color. In the meantime, of course, they were using these concepts of color and shape.*
>
> **T:** *Now, I realize that most of the children use the ability to recognize and point out the colors on the traffic signs. After our traffic sign activities, they were eager to use these language skills, especially in colors. I know the variety of colors in traffic signs is limited. However, they use these language skills in their daily life. For example, they knew red was for stop or green was for go.*

> **T:** *I can say this: it seems like they focus more on color concepts than shape concepts. Again, I'm going to start with traffic signs, but they try to make the color the same, that's why they focus more on this subject, but for example, they don't try to make it a circle. For instance, they just make a random circle there. So, in this case, children have no conversations on the concept of shape compared to colors.*

When the classroom teacher was asked about the knowledge of the children in the class in terms of colors and shapes, the teacher stated that the children cannot generally have problems with the primary colors but sometimes have difficulty with secondary colors. As for shapes, she indicated that they were less successful in shapes and confused some shapes.

> **T:** *I mean, of course, there are colors and shapes that children mistake. Because you know they are young. I think their ability to recognize and express colors is good. For example, 90% of the children in the class can do this easily. However, in the shape part, they can confuse some shapes. Again, shapes that are a bit like each other, especially squares and rectangles.*

4.5.1.4. Subtheme 4: Children's Interactions with Environmental Prints

During the pre-interview, questions were posed to the teacher regarding the frequency and content of children's interactions with environmental prints (EPs). Data gathered were categorized as the content and frequency of children's interactions with EPs. The teacher observed that most of the children usually engaged with EPs both inside the classroom and around the school environment. In this context, the teacher noted that when children encountered EPs, they were generally eager to ask questions about what the EP said. These interactions typically focused on what was written on the EPs that caught the children's interest and their meaning.

> **T:** *There is a big supermarket near our school, and the logo of this supermarket is quite striking. It can be seen from the window. Whenever some children know this logo, they ask each other, 'What does it say here? The children who know it answer immediately.*

> **T:** *When we go on field trips, children can observe their surroundings, so they see billboards or, I don't know, market names. When they see these signs,*

the children usually say, "There is GİMSA here." And when one child does this, the others try to say whatever logo, brand, market, or whatever they see.

4.5.2. Post-findings Emerged from the Teacher's Interview

Post-interviews with the teacher aim to display her perspectives on changes in children's logographic reading and receptive, expressive skills on colors and shapes before and after the implementation.

Like the post-interview with mothers, the same set of interview questions was used for both the pre-and post-interviews, with four additional questions included in the post-interview to explore further any changes observed in the classroom environment.

These additional questions were designed to explore the teacher's insights on how the children's interactions with EPs, like logos, emblems, and symbols, changed after participating in the implementation. For example, one question asked whether the teacher noticed any general changes in children's engagement with these environmental prints and if the children appeared more knowledgeable about basic features such as colors and shapes than before the implementation.

Another question aims to show whether the teacher observed any changes in how children used environmental prints during or after the implementation, such as discussing more specific features of these environmental prints (e.g., pointing out an oval in the EPs).

The focus is on understanding how these changes emerge in the school setting, providing a detailed view of the children's development in recognizing and understanding environmental prints. In addition to the themes identified in the pre-interview, the '*Perceptions of Children's Learning Outcomes' theme* has emerged. The themes and sub-themes that emerged from the teacher's post-interview are presented in Table 4.7.

Table 4. 7. Themes and Sub-themes that Emerged from the Post-interview of the Teacher

Themes	Sub-Themes	Explanations
Recognizing Environmental Prints	• Recognizing original products with EP • Recognizing a colored photograph of the original product with EP • Recognizing only the EP, even without the product present • Recognizing EP in black-and-white • Recognizing EP in plain text forms	*Recognizing original products with EP'* corresponds to **Level 1** '*Recognizing a colored photograph of the original product with EP'* corresponds to **Level 2** '*Recognizing only the EP even without the product present'* corresponds to **Level 3** *'Recognizing EP in black-and-white forms'* corresponds to **Level 4** *'Recognizing EP in plain text forms'* corresponds to **Level 5**
The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes	• Ability to identify and show colors • Ability to identify and show shapes	*Identifying colors verbally* refers to receptive skills *Demonstrating colors when prompted* refers to expressive skills *Identifying shapes verbally* refers to receptive skills *Showing shapes when presented* refers to expressive skills
Children-Environmental Print Interaction	• The content of the children-EP interaction • The frequency of the children-EP interaction	
Perceptions of Children's Learning Outcomes	• Increasing desire for early writing • Recognizing more environmental print in free play time • Increasing motivation for learning letters and sounds	

4.5.2.1. Subtheme 1: Recognizing Environmental Prints

In the post-interview, the same questions were posed to the teacher; thus, the same sub-themes emerged as in the previous session. These sub-themes include recognizing original products with environmental print (EP) *(Level 1),* recognizing a colored photograph of the original product with EP *(Level 2)*, recognizing only the

EP without the product present *(Level 3)*, recognizing EP in black-and-white *(Level 4)* and recognizing EP in plain text forms *(Level 5)*

The teacher's perspective on this issue is directly cited and presented below.

> **T:** *Most children can easily read the logos you use in the activities. There was a learning center you created. For example, I observed them saying the name of the logo when they were building from milk cartons.*
>
> **T:** *I want to share an interesting observation from the learning center you created. For instance, some children could read the logo in plain text form. I'm unsure if it's because children (C17) and (C8) are more eager to read and write, but I witnessed such an event.*
>
> **T:** *Especially if it starts with the first letter of the child's name, I have seen that they can only read the written form of that logo, but as I said, I observed such a thing for 1-2 children.*

4.5.2.2. Subtheme 2: The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes

The findings from the final teacher interview revealed the theme *'The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes'* along with its associated sub-themes. The sub-themes encompass children's abilities to recognize and demonstrate colors, as well as to recognize and demonstrate shapes. Identifying colors verbally is considered receptive skills, while demonstrating colors when prompted is seen as expressive skills. Similarly, identifying shapes verbally reflects receptive skills, whereas showing shapes when presented is considered expressive skills.

In the post-interview, when the class teacher was asked about the children's confusion about the colors and shapes, she stated that almost all the children knew the primary and secondary colors. She said that the children were particularly good at colors and made fewer mistakes in confusing shapes.

> **T:** *I believe many children have no significant problems recognizing colors. They used some colors to confuse, but I hardly observed that anymore. For example, the other day, I asked the children to sort the toys by color and find*

the green, yellow, and orange ones. Most of them, except for a few, quickly identified the toys in those colors without hesitation.

T: *In an art activity, I asked the children to name the colors they were using. One child picked up the purple paint and said, 'This is purple.' Children who previously had difficulty naming colors can now more easily identify and name the paints and colors they use.*

T: *The biggest problem in our class was the confusion of geometric shapes. They had issues with this, like a circle, an oval, a square, and a rectangle. I never had a situation that attracted my attention; not many children were confused. This was something I used to encounter frequently.*

T: *I cannot say that all children know all the colors, but I can say that there is not much confusion about the secondary colors. I think your activities were helpful in that regard. Now, they are much better at colors than shapes.*

4.5.2.3. Subtheme 3: Children's Interactions with Environmental Prints

The central theme of "*Children-Environmental Print Interaction*" was identified from the final teacher interview, along with two related sub-themes. These sub-themes include "*The content of the children-EP interaction"* and "*The frequency of the children-EP interaction."*

The teacher noted that children frequently engaged with environmental prints and actively interacted with and discussed the color and shape elements related to these prints.

T: *They are very interested in logos and brands. The logos and brands of the materials we use in the classroom mainly catch their attention. They often show them to each other, and it's something that primarily draws their attention. Overall, I can say that they engage with them quite a lot. Even if one of them draws attention to this topic, the others also join in. I think the whole class interacts with logos a lot, influenced by each other as well.*

T: *In the classroom, they look for shapes in the logos they see. It's related to the colors and shapes we teach in class. So, it's not just about saying what brand the logo represents, but I've noticed that they are now paying more attention to the shapes and colors of those logos.*

4.5.2.4. Subtheme 4: Perceptions of Children's Learning Outcomes

The post-interview session also included four additional questions not presented in the initial interview, and findings related to the theme of children's learning outcomes were obtained. The sub-themes identified were an increasing desire for early writing, recognizing environmental print in free play time, and increasing motivation for learning letters and sounds. The teacher's direct quotations regarding this subject are as follows.

> **T:** *Now, they recognize many more visual stimuli and logos. I could observe this very quickly, especially during free play time.*
>
> **T:** *Actually, what interested me was this. When children draw during free play time, they write down any logo they use in their activities and look at it. Then, they draw a picture related to it. I noticed this, especially in a few of the girls, and you know that when one of them does this, the other girls immediately start doing the same.*
>
> **T:** *I also realized this. For example, they can say something from the letters in the logos you use at the event. My name starts with P, PINAR, and PRITT, which also begins with P. They often ask me or my intern about the first letter in the logos. In this respect, it seems as if their motivation has increased.*

4.5.3. Comparison of the Findings of Pre-Post Interviews with Teacher

4.5.3.1. Subtheme 1: Recognizing Environmental Prints

According to the comparative analysis of the pre-and post-interviews with the class teacher, the findings indicate that exposure to environmental prints (EPs) in various forms has benefited a larger number of children in terms of logographic reading skills. Unlike the pre-interview, the newly emerged sub-theme "*Recognizing EP in Plain Text Forms*" demonstrates that only 1-2 children improved logographic reading skills following the EP activities. At the same time, the majority did not exhibit notable development. Although the same sub-themes emerged, the findings from the post-interview indicate an increase in the number of children able to demonstrate logographic reading skills associated with each sub-theme. Additionally, unlike in the pre-interview, the classroom teacher noted that a few children could read the logo's plain text form, leading to the inclusion of a new sub-theme: '*Recognizing EP in plain text forms.' (Level 5).*

T: *I previously mentioned that children wouldn't be able to read logos because they don't know how to read and write. I am aware of that, but something happened. After the activities you covered in class, I observed the following in a particular child. For example, the child asks me about the first letter in the logo... Of course, I am talking about the printed version of the logo. The child can read the logo just by recognizing the first letter. But I must also mention that this child might be the one who receives the most educational support from their family*

T: *I can't say all the children, but generally, I've witnessed that most of them read the logos when they see them. What surprised me the most is that you know how you have that black-and-white format for the logos. They can even read the logos at this level, even in that version.*

4.5.3.2. Subtheme 2: The Role of Environmental Prints on Receptive and Expressive Skills related to Colors and Shapes

Since the same questions were asked in the pre- and post-interviews with the teacher, the same sub-themes emerged. These sub-themes are the ability to identify and show colors and the ability to identify and show shapes. According to the post-interview findings, although the same sub-themes emerged, it was stated that more children showed receptive and expressive skills in terms of color and shape in the post-interview compared to the number of children stated in the pre-interviews.

T: *I believe there have been improvements in children's language development compared to before. I think I can explain it like this: We have some children, and particularly when learning concepts, they can struggle more than their peers. Before your activities, some children would mix specific colors, especially secondary ones. After the implementation, I no longer observe these confusions.*

T: *In most of the class, when asked to point out colors, they could do it more quickly, but they struggled more when trying to name the color. Now, I can say that this situation has positively changed.*

T: *I had mentioned the concept of shapes to you before, where similar shapes are like squares and rectangles. I believe these concepts have become more clarified in the games you played. Based on my classroom observations, I think the number of children who experienced this type of confusion has decreased.*

> **T:** *I have observed progress in children regarding colors. I used to know that they were better with primary and secondary colors. Now, it seems they no longer hesitate when showing any color. I can say that almost all of them have improved in this area. From what I've seen while painting, they can quickly identify the crayon color they pick up.*
>
> **T:** *I believe the activities also had a beneficial effect on shapes. As you know, due to their young ages, they couldn't distinguish some shapes, as I've mentioned before. But now, I've noticed that this is no longer the case. You set up a play in the learning center where they had to knock down shapes by throwing a ball at them. They loved it. I think integrating logos with such plays provides more benefits to more children.*

When asked about the children's difficulties with colors and shapes, the class teacher noted an improvement since the introduction of EP activities. She mentioned that almost all the children were now familiar with primary and secondary colors. Additionally, she highlighted that the children had become proficient at recognizing colors and made fewer errors in distinguishing shapes.

> **T:** *The biggest problem in our class was the confusion of geometric shapes. They had issues with this, like a circle, an oval, a square, and a rectangle. I think your activities were beneficial. I never had a situation that attracted my attention; not many children were confused. This was something I used to encounter frequently.*
>
> **T:** *I cannot say that all children know all the colors, but I can say that there is not much confusion about the secondary colors. I think your activities were helpful in that regard. Now, they are much better at colors than shapes.*

4.5.3.3. Subtheme 3: Children's Interactions with Environmental Prints

The same sub-themes, the content of the child-environmental print (EP) interaction, and the frequency of the children-EP interaction emerged because of the same questions during the final teacher interview. Although the same sub-themes emerged from the post-interview, there was a noticeable increase in the number of children who could demonstrate logographic reading proficiency and receptive and expressive skills, and diversity in the content of these interactions was observed by the teacher. The teacher reported that children's interactions with EPs were more frequent than before. She also argued that children actively interacted with and discussed color and shape elements associated with environmental prints.

T: *Apart from traffic symbols, I hadn't used these visual stimuli in class activities before. Our focus was solely on understanding what they represented. After the activities, the children talked about the text in the logo and the colors and shapes within it. This was my observation regarding the materials prepared in the learning center.*

T: *As far as I can see, because of the increased interest in logos and visual stimuli in all children in general, they are constantly interacting with the logo materials you use in the activities, even when you are not in the classroom, even during free play time every morning. Compared to before, I can say that they are more interested in logos.*

T: *I mean, in the past, they would most ask, 'Teacher, what is written here?' or tell them themselves if they knew. Now, they can express their opinions about the colors or shapes in that logo. Let me even say that they engaged in color and shape while interacting with logos.*

4.5.3.4. Subtheme 4: Perceptions of Children's Learning Outcomes

In the final interview, the teacher, based on observations in the classroom setting, asserted that the activities not only supported logographic reading skills and receptive, expressive skills but also notably enhanced children's interest in early writing.

Furthermore, these activities increased children's awareness of environmental prints and boosted their motivation to learn letters and sounds.

T: *Let me say something about this topic. This situation started mainly after you played games with the children in class. For example, children in class would find a brand logo and say, 'The first letter of this is the same as the first letter of my name. It starts with P.' Even (C17), while drawing, for instance, made a TV and added the TRT Çocuk emblem.*

T: *I think they are more eager to learn letters and sounds because they started talking about which letter their name begins with, saying things like, 'My name starts with this letter.' This was something that didn't happen before.*

4.6. Findings Emerged from the Checklists Filled by the Teacher

The checklists, completed by the teacher before and after environmental print (EP) activities for each child, are essential for assessing the receptive and expressive skills of preschoolers aged 48-54 months concerning colors and shapes. The checklists aim to systematically document the children's understanding and recognition of these concepts and track progress over time.

4.6.1. Pre-findings Emerged from the Checklists Filled by the Teacher

Pre-findings from the checklists were illustrated using bar graphs to present the findings. Four bar graphs were used to show the recognition of each color and shape in terms of both receptive and expressive skills.

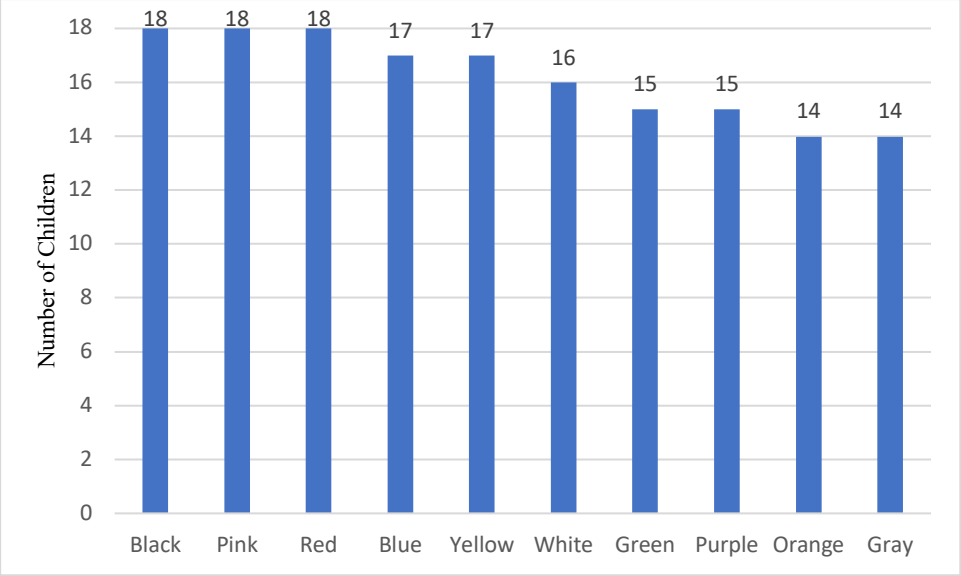


Figure 4. 22. Pre-findings Regarding Receptive Skills in Terms of Colors

Figure 4.22 shows children's pre-findings regarding receptive skills in understanding various colors. Within the scope of this study, receptive skills refer to the ability to understand and process the information received, such as correctly displaying color names when asked visually. All children demonstrated excellent receptive skills in identifying black, pink, and red colors. Moreover, the colors of blue and yellow are

also well recognized, with 17 of the children accurately identifying them. In contrast, colors such as orange and gray have the lowest receptive skill rates, with only 14 children identifying them correctly. While most children recognize these colors, they have slightly lower rates than black, pink, red, blue, and yellow.

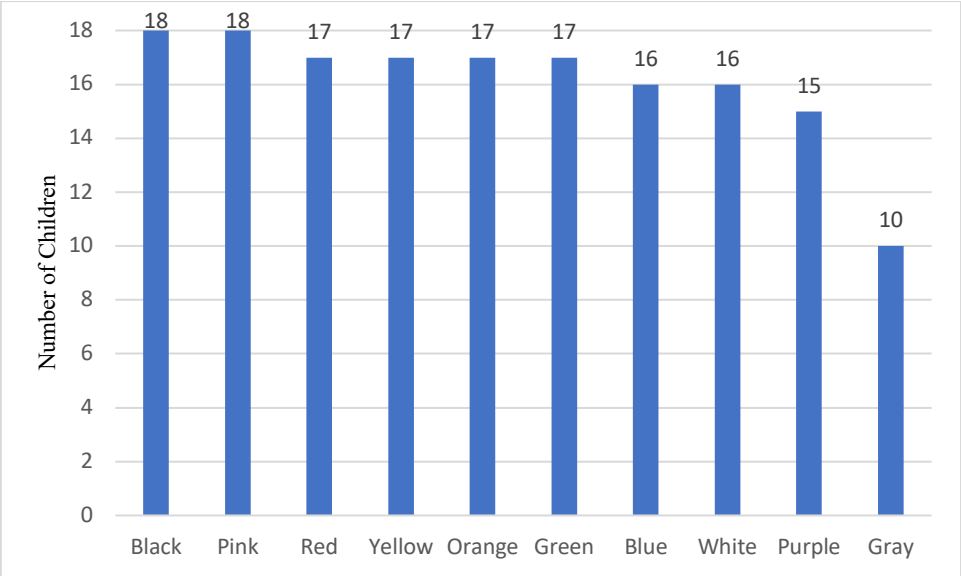


Figure 4. 23. Pre-findings Regarding Expressive Skills in Terms of Colors

Figure 4.23 presents the pre-findings on children's expressive skills regarding colors. In this study, expressive skills refer to identifying colors when prompted verbally. The pre-findings indicate that all children displayed perfect expressive skills for black and pink colors. Furthermore, 17 children successfully demonstrated expressive skills with red, yellow, green, and orange, while 16 showed success with blue and white. Purple is correctly expressed by 15 children, indicating a considerable level of familiarity but still slightly lower compared to more typical colors like black or red. Similarly, gray presents a more critical challenge, with only ten children able to express this color accurately.

To sum up, before the implementation, according to the findings on the receptive and expressive skills of the children participating in the study regarding colors, there is high consistency in some colors. In contrast, some variations are observed in others. The exact number of children demonstrated receptive and expressive skills for black,

pink, yellow, white, and purple. Also, it is indicated that these colors were very well-known among the children.

The colors red, blue, and gray indicate more children demonstrating success in receptive skills, whereas more children demonstrate success in expressive skills in green and orange colors.

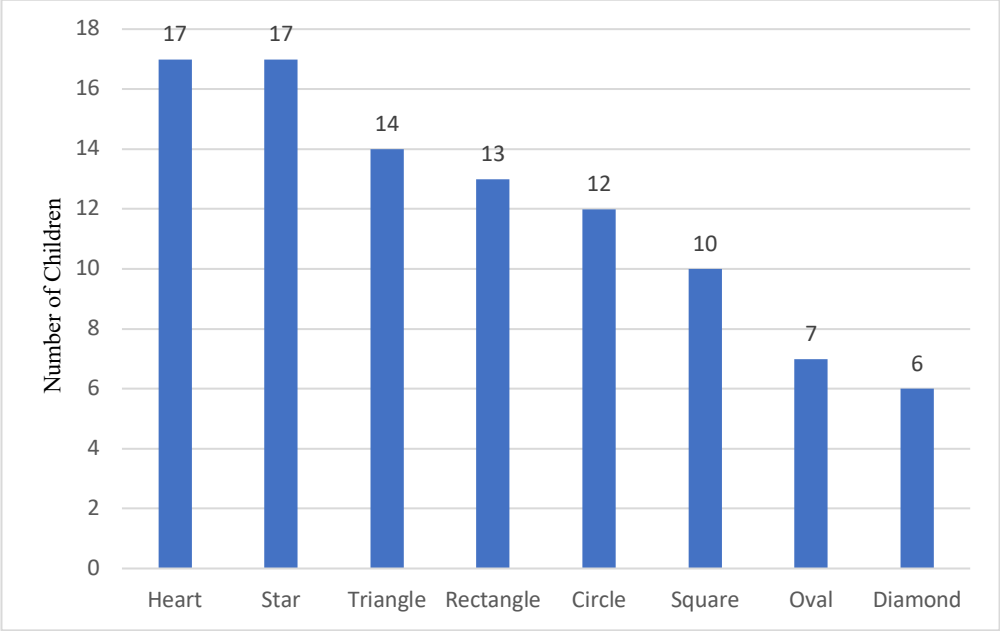


Figure 4. 24. Pre-findings regarding Receptive Skills in Terms of Shapes

Figure 4.24 overviews children's receptive skills in recognizing various shapes before implementing environmental print activities. The graph represents the number of children who correctly identified each shape. In this context, receptive skills refer to children's ability to visually recognize and understand shapes correctly. According to the pre-findings, 17 children recognized the heart and star shapes with the highest proficiency. The triangle and rectangle shapes were also well recognized, with 14 and 13 children correctly identifying these shapes, respectively. While these shapes are slightly less recognized than the heart and star, they still show a relatively high level of recognition by most children. However, despite being basic geometric shapes, 12 children recognized the circle, and ten children recognized the square. Additionally, seven children recognized the oval shape, and six recognized the diamond shape.

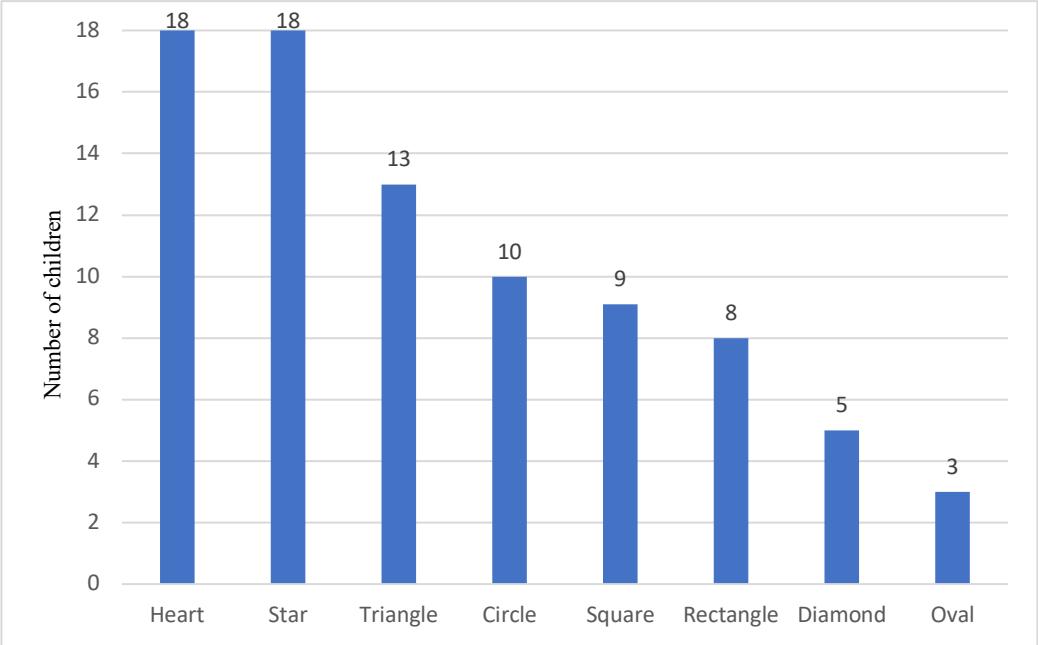


Figure 4. 25. Pre-findings regarding Expressive Skills in Terms of Shapes

Figure 4.25 indicates pre-findings regarding children's expressive skills in various shapes. Expressive skills refer to the ability to name shapes when prompted verbally. The data reveals that all children accurately express the shapes of the heart and star, and all the children name these shapes correctly, indicating that these shapes are easily recognizable and nameable by the children. Additionally, the triangle was correctly identified by 13 of the children, displaying a relatively high level of expressive skills. Furthermore, the children recognized that the geometric shapes of circles, squares, and rectangles were 10, 9, and 8, respectively. However, the shapes of diamond and oval were observed with recognition rates of only 5 and 3, respectively.

The study's findings on children's receptive and expressive skills regarding shapes reveal that all children successfully recognized and identified the heart and star shapes. The triangle shape also showed a high level of recognition, with most children demonstrating receptive and expressive skills. However, there was a noticeable decline in the recognition and naming of basic geometric shapes such as circles, squares, and rectangles, with fewer children able to identify these shapes

verbally. The most significant challenges were observed with the diamond and oval shapes, where only a minority of children could recognize and name these shapes.

4.6.2. Post-findings Emerged from the Checklists Filled by the Teacher

Post-findings from the checklists were indicated using bar graphs to present the findings. Four bar graphs were used to show the recognition of each color and shape in terms of both receptive and expressive skills.

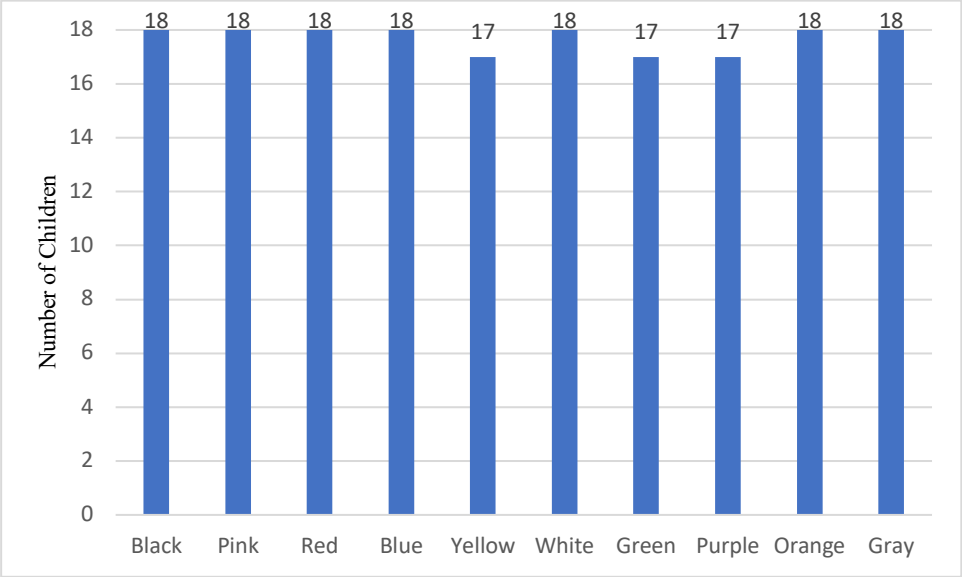


Figure 4. 26. Post-findings Regarding Receptive Skills in Terms of Colors

As demonstrated in Figure 4.26, all children successfully recognized the colors black, pink, red, blue, white, orange, and gray. However, a slightly lower number of children, specifically 17, demonstrated receptive skills in recognizing the colors yellow, green, and purple. This graph indicates that nearly all children were successful in identifying the colors.

In Figure 27, all children successfully named the colors black, pink, red, yellow, orange, blue, white, and purple. However, a slightly smaller number of children, 17 in total, demonstrated proficiency in expressing the colors green and gray. This situation indicates that most children are skillful in expressing these colors, but only a few had difficulties expressing the colors green and gray.

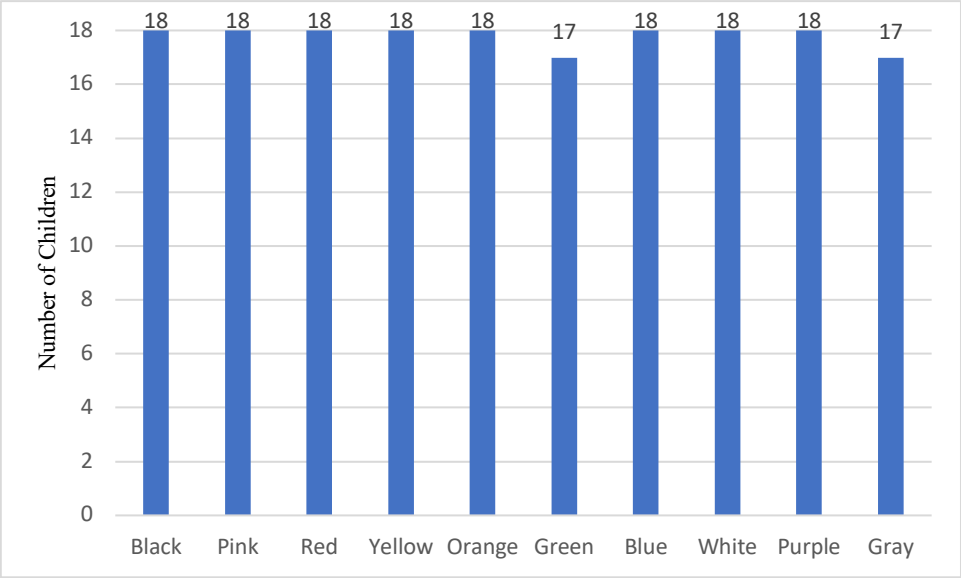


Figure 4. 27. Post-findings regarding Expressive Skills in Terms of Colors

In comparing children's receptive and expressive skills related to colors, the findings indicate that nearly all children successfully recognized the colors, with only a slight decrease observed in the recognition of yellow, green, and purple. In contrast, while children demonstrated strong expressive skills overall, some encountered challenges in expressing green and gray colors. This comparison highlights that although children generally excelled in recognizing colors, they faced difficulties expressing specific colors, particularly compared to their receptive skills.

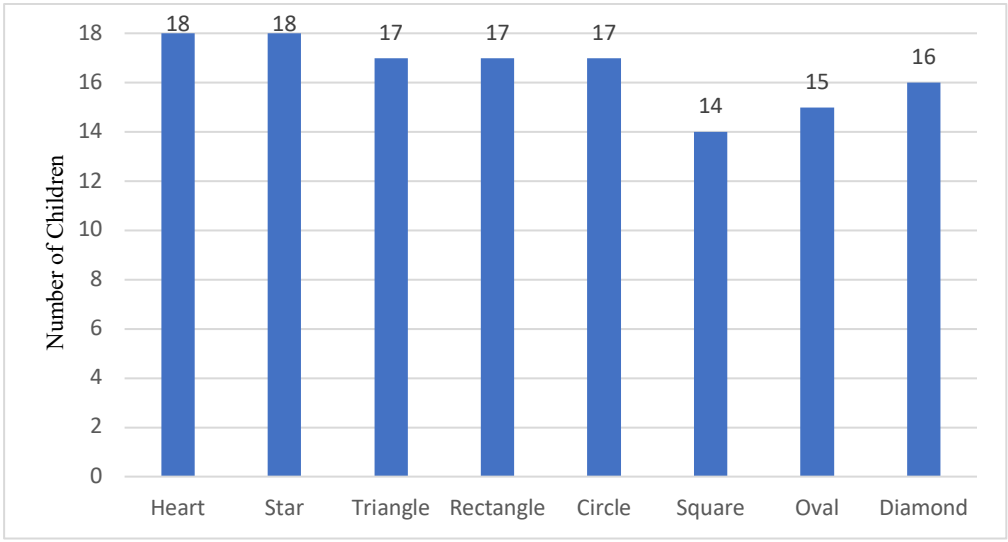


Figure 4. 28. Post-findings regarding Receptive Skills in Terms of Shapes

As shown inFigure 28, all children successfully identified the heart and star shapes. A slightly lower number of children, precisely 17, demonstrated receptive skills for triangle, rectangle, and circle shapes. Meanwhile, 16 children identified the shape diamond, 15 recognized the shape oval, and 14 successfully identified the shape square. This finding displays that while most children were proficient in recognizing these shapes, there were slight differences in their receptive skills for certain shapes, particularly square and oval.

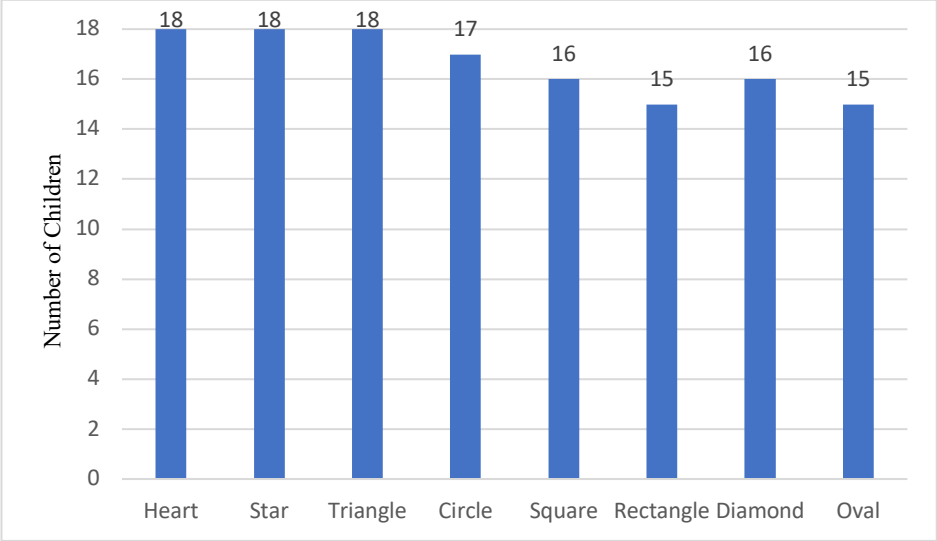


Figure 4. 29. Post-findings regarding Expressive Skills in Terms of Shapes

As depicted in Figure 29, it is evident that all children could express the shapes of heart, star, and triangle. However, a slightly lower number of children, specifically 17, successfully expressed the shape of a circle. Additionally, 16 children demonstrated proficiency in expressing square and diamond shapes, while 15 could articulate rectangle and oval shapes. This distribution shows that although most children successfully express these shapes, some may have difficulty expressing certain shapes, including squares, rectangles, diamonds, and ovals.

In comparing children's receptive and expressive skills related to shapes, it is shown that receptive skills to recognize shapes are generally more robust than expressing them. Regarding receptive skills, children demonstrated greater success in identifying a more comprehensive range of shapes, although challenges were

observed with specific shapes such as square and oval. Conversely, while children exhibited proficiency in expressive skills overall, they encountered more difficulties articulating certain shapes. Notably, shapes such as rectangles, diamonds, and ovals posed challenges in expression. This comparison highlights that children are generally more proficient at recognizing shapes than expressive skills.

4.6.3. Comparison of the Findings Emerged from the Checklists Filled by the Teacher

Pre- and post-findings that emerged from checklists also represented data on various aspects of children's receptive and expressive skills. This section presents concepts of both color and shape concerning receptive and expressive skills. The percentage figures in the graph represent the number of children who correctly identified and named color and shape concept knowledge. In this context, the following sections present the graphs in the following order: first, the *Pre-Post Findings Regarding Receptive Skills in Terms of Colors;* second, the *Pre-Post Findings Regarding Expressive Skills in Terms of Colors*; third, the *Pre-Post Findings Regarding Receptive Skills in Terms of Shapes*; and finally, the *Pre-Post Findings Regarding Expressive Skills in Terms of Shapes*.

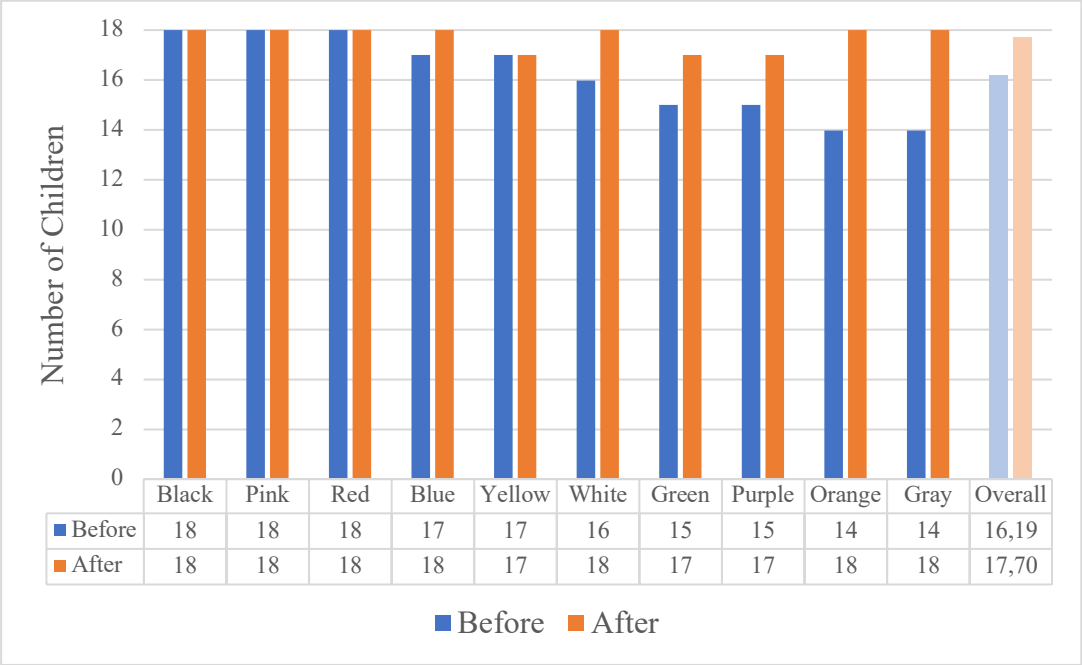


Figure 4. 30. Pre-Post Findings regarding Receptive Skills in Terms of Colors

As indicated in Figure 4.30, according to the graph, all children correctly identified the colors black, pink, and red before the implementation. After the implementation, additional improvements were observed in recognizing blue and white. Specifically, the number of children who correctly identified the color blue increased from 17 to 18, and the number of children who correctly identified the color white rose from 16 to 18. It is pointed out that a higher percentage of children correctly identified the colors compared to before.

A notable finding was observed in recognizing the colors orange and gray. Specifically, after the EP activities, the number of children who correctly identified the color orange increased from 14 to 18. Similarly, the number of children who recognized gray rose from 14 to 18. These results indicate a considerable improvement in children's receptive skills regarding these colors.

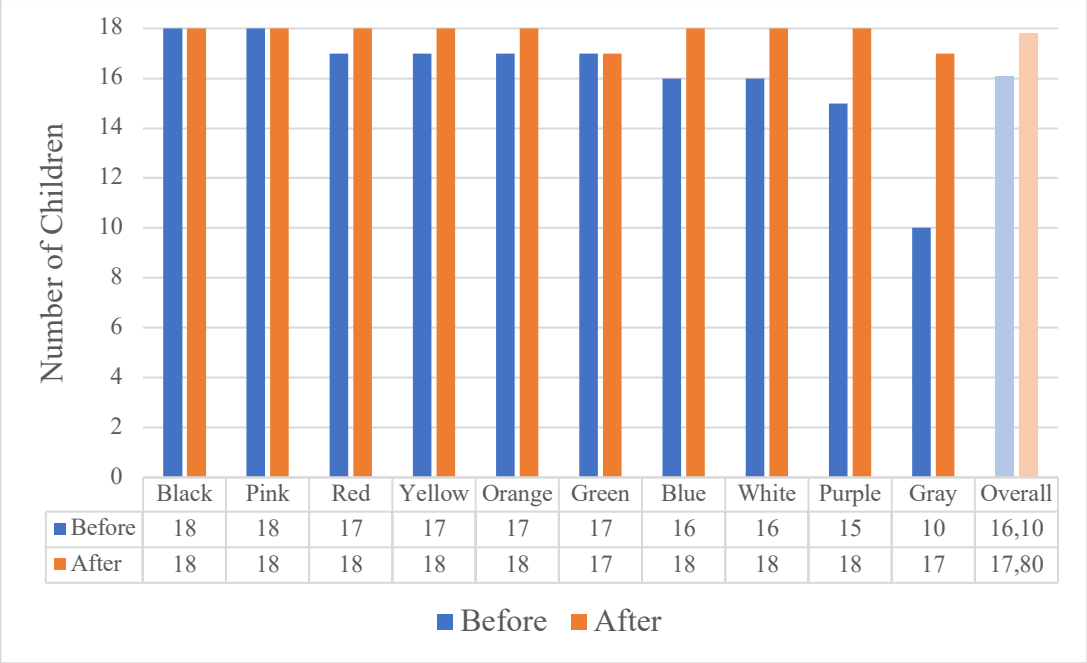
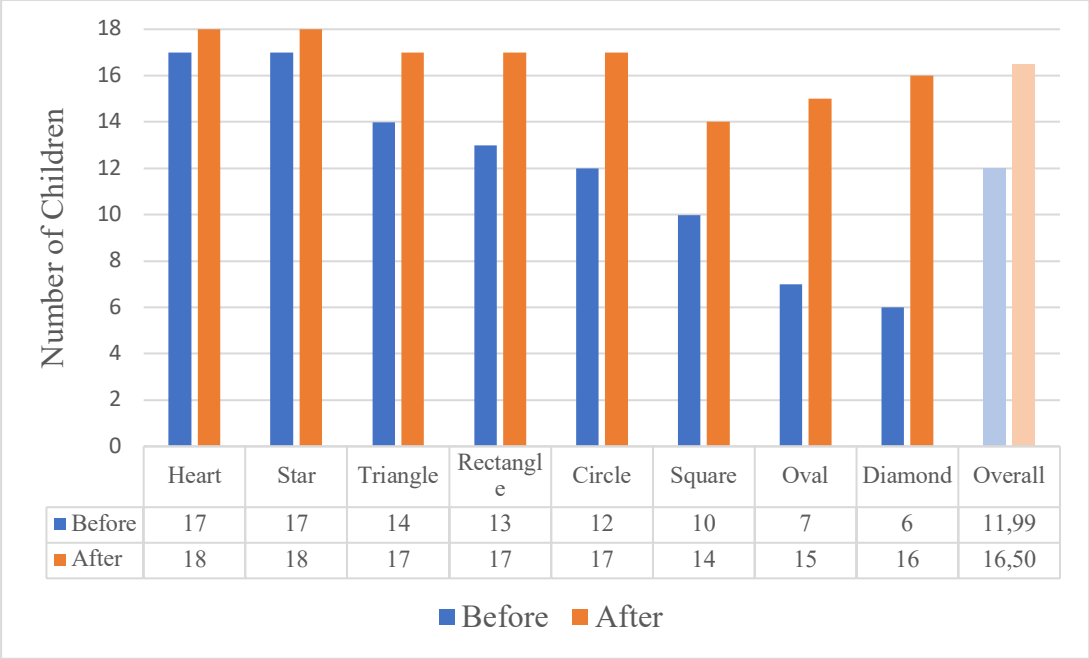


Figure 4. 31. Pre-Post Findings regarding Expressive Skills in Terms of Colors

As seen in Figure 4.31, all children correctly named the colors black and pink before the implementation. After the implementation, every child was correctly named black, pink, red, yellow, orange, blue, and white. This shows a remarkable growth,

especially in naming the color gray (increasing from 10 to 17 children), purple (increasing from 15 to 18 children), and white (increasing from 16 to 18 children). After the implementation, the correct naming language skills for all colors indicated that a larger number of children correctly named the colors compared to before.
A notable outcome was observed with gray. The number of children correctly named gray notably increased from 10 to 17. These results demonstrate improvement in children's ability to recognize and name these colors.

The comparison of children's receptive and expressive skills related to colors showed improvements in both domains. Before the implementation, all children correctly identified the colors black, pink, and red, but after the implementation, further improvements were observed in the recognition of blue and white. Notably, substantial gains were made in the recognition of orange and gray. The expressive skills also improved with the increase in the number of children who correctly named various colors. Overall, there was notable progress in both receptive and expressive skills, with specific colors showing more pronounced improvements in expressive skills.



	Heart	Star	Triangle	Rectangle	Circle	Square	Oval	Diamond	Overall
Before	17	17	14	13	12	10	7	6	11,99
After	18	18	17	17	17	14	15	16	16,50

Figure 4. 32. Pre-Post Findings regarding Receptive Skills in Terms of Shapes

Figure 32 reveals that the number of children recognizing all shapes increased after the implementation. The number of children who recognized the heart and star shapes rose from 17 to 18, indicating that all children recognized these shapes. Furthermore, there was a remarkable increase in the number of children who recognized the triangle and rectangle shapes, with the number rising from 14 to 17 for the triangle and from 13 to 17 for the rectangle. The circle shape was recognized by 17 children, an increase from 12, and the square shape was recognized by 14 children, reflecting notable improvements in the recognition of primary geometric shapes. The most remarkable progress was observed in recognizing the oval and diamond shapes. The number of children who recognized the oval shape increased from 7 to 15, while those who recognized the diamond shape increased from 6 to 16.

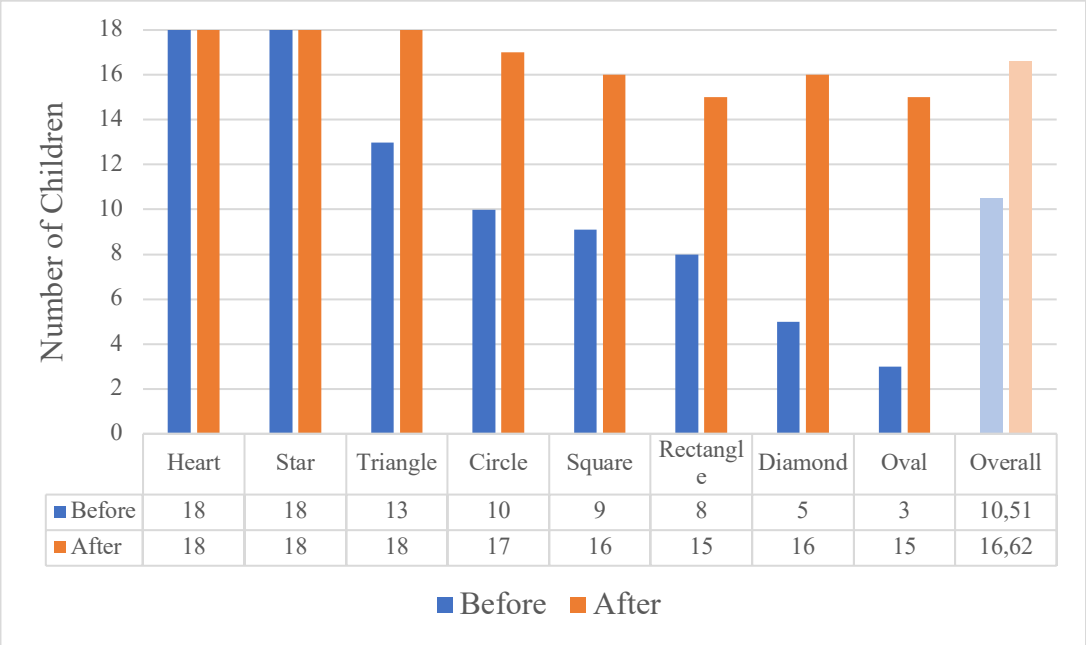


Figure 4. 33. Pre-Post Findings regarding Expressive Skills in Terms of Shapes

The findings illustrated in Figure 33 show that the number of children correctly named all shapes increased after the implementation. The number of children who correctly named the heart and star shapes remained at 18, and 13 correctly named the triangle shape, and this number increased to 18, showing remarkable improvement. The number of children correctly named the circle shape increased from 10 to 17.

Similarly, notable increases were observed for the square, rectangle, diamond, and oval shapes. The number of children correctly named the square increased from 9 to 16, for the rectangle from 8 to 15, for the diamond from 5 to 16, and the oval from 3 to 15. The most striking results were observed for the oval and diamond shapes, dramatically increasing the number of children who correctly named these shapes.

The comparison of pre-post findings reveals considerable progress in the children's recognition and naming of various shapes. Initially, shapes such as hearts and stars were the most easily identified and named by all children, a trend that continued in the post-finding. Noteworthy progress was also observed in triangles and rectangles, with remarkably more children correctly recognizing and naming these shapes after the implementation. There was a considerable increase in the number of children who could correctly identify and name these shapes for basic geometric shapes such as circles and squares. The most remarkable improvements were seen in the recognition and naming of ovals and diamonds, where the number of children who could correctly identify and name these shapes increased dramatically from the pre- to post-findings. Overall, notable advancements were observed in both receptive and expressive skills. Particularly pronounced progress was noted in expressive skills, especially in recognizing and naming more complex shapes. This indicates that children have improved in verbally identifying shapes and verbally expressing this knowledge.

4.7. Children's Logographic Reading and Receptive, Expressive Skills on Colors and Shapes in Terms of Gender

In this section, the aim is to compare findings in terms of children's gender. Therefore, the findings were compared and analyzed to highlight a comprehensive understanding of boys and girls. Of the 18 children who participated in the study, 9 were girls and 9 were boys. In this context, first, the pre-test and post-test comparison of the logographic reading test results were analyzed in terms of gender. Then, the checklist results were presented comparatively regarding gender through four different graphs. Finally, bar graphs visualized observation data, and gender-based comparisons were made.

4.7.1. Children's Logographic Reading Skills by Gender

As shown in Figure 34, at Level 1, boys had a pre-test success rate of 36.1% and a post-test success rate of 68.3%, while girls had a pre-test success rate of 35.8% and a post-test success rate of 68.9%. Both boys and girls demonstrated notable improvement in the post-test, achieving similar percentages. At Level 2, boys had a pre-test success rate of 40.3% and a post-test success rate of 66.9%, while girls had a pre-test success rate of 34.4% and a post-test success rate of 66.1%.

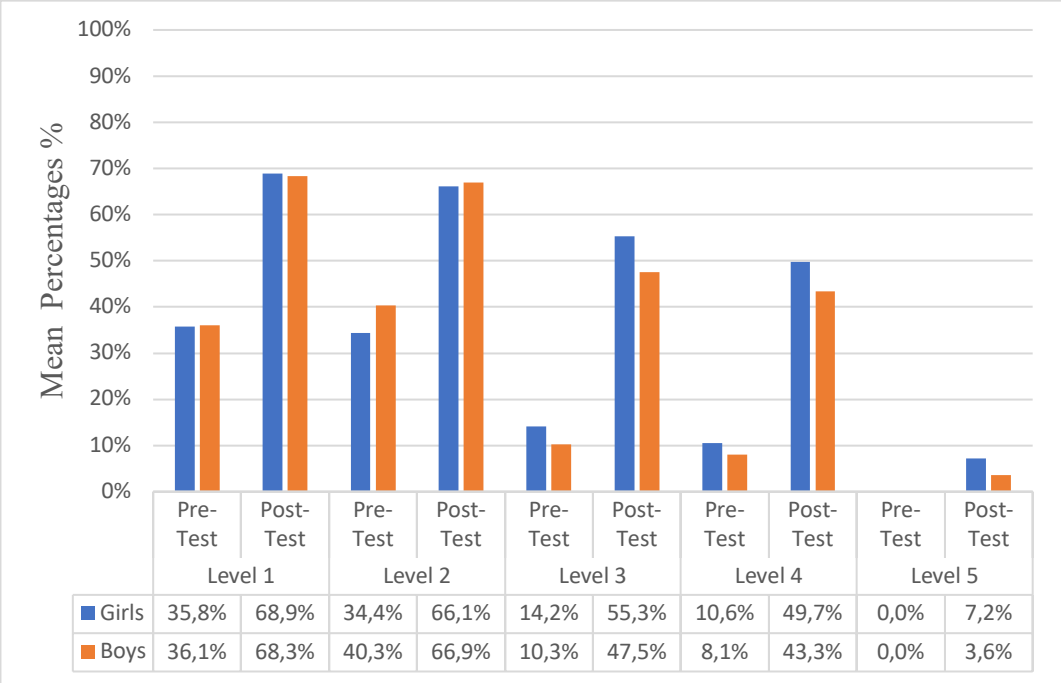


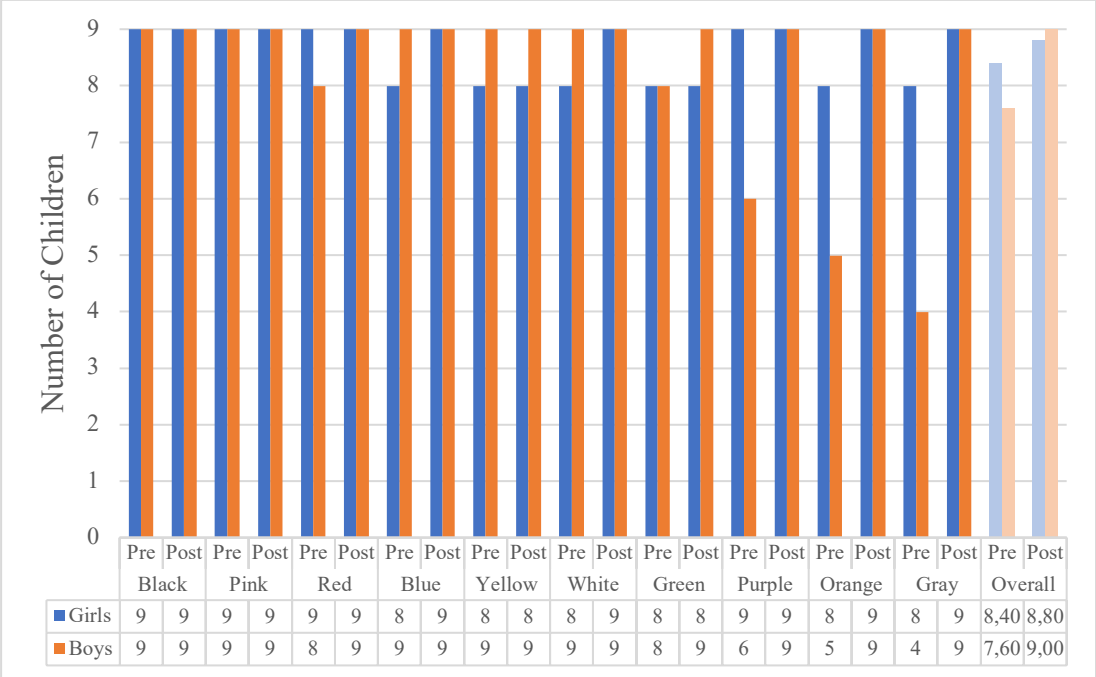
Figure 4. 34. Comparison of the Pre-and Post-results Emerged from the Logographic Reading Test Related to Children's Gender

Although there was a slight difference initially, both groups achieved similar results in the post-test. At Level 3, boys displayed a pre-test success rate of 10.3% and a post-test success rate of 47.5%, while girls had a pre-test success rate of 14.2% and a post-test success rate of 55.3%. Girls achieved higher percentages initially and in the final test, but both groups demonstrated noticeable progress. At Level 4, boys had a pre-test success rate of 8.1% and a post-test success rate of 43.3%, while girls had a pre-test success rate of 10.6% and a post-test success rate of 49.7%. Girls slightly outperformed boys in both the pre-test and post-test. Finally, at Level 5, boys and

girls started with a 0.0% success rate, but in the post-test, boys achieved a success rate of 3.6%, while girls reached a success rate of 7.2%. These results indicate that girls achieved higher success rates than boys in the logographic reading tests and showed remarkable progress at certain levels. In the more challenging levels of 3, 4, and 5, girls achieved better results than boys in the pre-test and post-test. During the selection of environmental prints for this study, careful consideration was given to ensuring gender balance in the materials presented. Despite these efforts, the findings revealed that girls demonstrated higher logographic reading skills compared to boys.

4.7.2. Children's Receptive and Expressive Skills in Terms of Colors by Gender

In this section, bar graphs, which are "*Children's receptive skills in terms of colors by gender*" and "*Children's expressive skills in terms of colors by gender*" were presented, and the findings were explained.



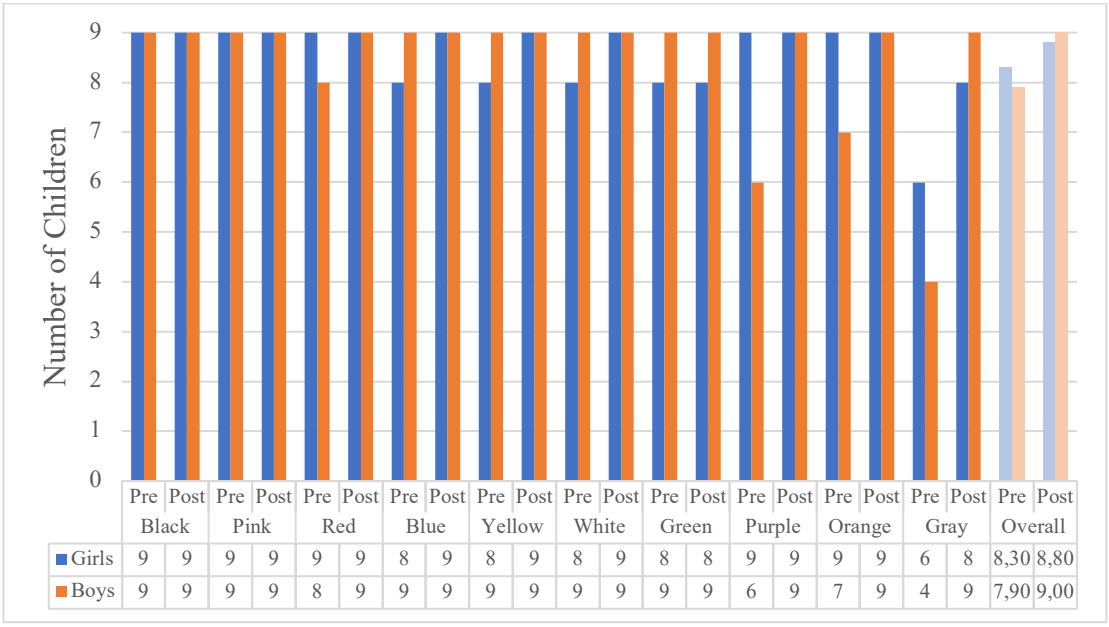
	Pre Black	Post Black	Pre Pink	Post Pink	Pre Red	Post Red	Pre Blue	Post Blue	Pre Yellow	Post Yellow	Pre White	Post White	Pre Green	Post Green	Pre Purple	Post Purple	Pre Orange	Post Orange	Pre Gray	Post Gray	Pre Overall	Post Overall
Girls	9	9	9	9	9	9	8	9	8	8	8	9	8	8	9	9	8	9	8	9	8,40	8,80
Boys	9	9	9	9	8	9	9	9	9	9	9	9	8	9	6	9	5	9	4	9	7,60	9,00

Figure 4. 35. Comparison of the Pre-post Findings Regarding Receptive Skills in Terms of Colors by Gender

As displayed in Figure 35, According to the graph, before the implementation, it was observed that all children successfully identified the colors black and pink in terms of

receptive skills. Additionally, all girls correctly identified purple, while all boys successfully recognized the colors blue, yellow, and white. Before the implementation, eight girls recognized the colors blue, yellow, white, green, orange, and gray. In contrast, eight boys recognized red and green, six recognized purple, five recognized orange, and four recognized gray. This indicates that before the implementation, boys showed lower success in recognizing the colors purple, orange, and gray than girls.

After the implementation, eight girls recognized the colors yellow and green, while the number of girls who recognized black, pink, red, blue, white, purple, orange, and gray increased to 9. The boys, on the other hand, successfully recognized all colors after the implementation. These results demonstrate significant improvements in boys' recognition of the colors orange and gray, where they initially performed poorly. After the EP activities, both genders achieved similar levels of success in color recognition.



	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	Black		Pink		Red		Blue		Yellow		White		Green		Purple		Orange		Gray		Overall			
Girls	9	9	9	9	9	9	8	9	8	9	8	9	8	8	9	9	9	9	6	8	8,30	8,80		
Boys	9	9	9	9	8	9	9	9	9	9	9	9	9	9	6	9	7	9	4	9	7,90	9,00		

Figure 4. 36. Comparison of the Pre-post Findings Regarding Expressive Skills in Terms of Colors by Gender

Figure 36 points out the improvements in expressive skills related to color naming before and after the implementation process, comparing results between boys and

girls. Before the implementation, all children correctly named black and pink. Girls demonstrated broader proficiency in color naming, accurately identifying red, purple, and orange. Conversely, all boys correctly named blue, yellow, green, and white, but their success varied with other colors. Specifically, eight boys were correctly named red, seven were named orange, six were named purple, and only four boys were named gray accurately. This indicates a notable difference, with girls showing higher achievement across a broader range of colors.

After the implementation, marked progress was observed across both genders. All children, regardless of gender, successfully named black, pink, red, blue, yellow, white, purple, and orange. Furthermore, while eight girls could correctly name green and gray, all boys successfully named all colors after the EP activities. This demonstrates remarkable advancements in boys' skills in naming colors they previously found challenging and highlights the overall improvement in color naming across both genders.

4.7.3. Children's Receptive and Expressive Skills in Terms of Shapes by Gender

In this part, bar graphs, which are "*Children's receptive skills in terms of shapes by gender*" and "*Children's expressive skills in terms of shapes by gender,*" were demonstrated, and the findings were elucidated.

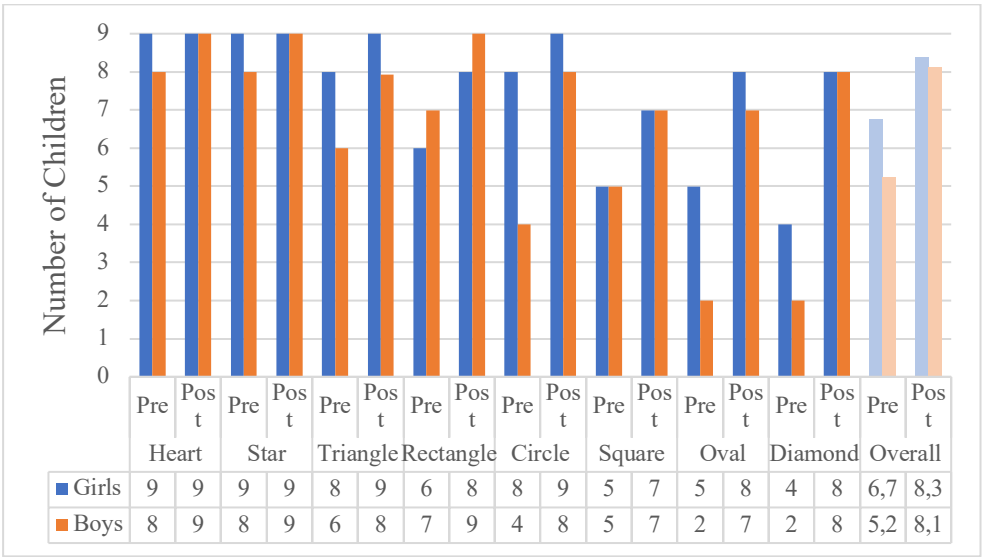
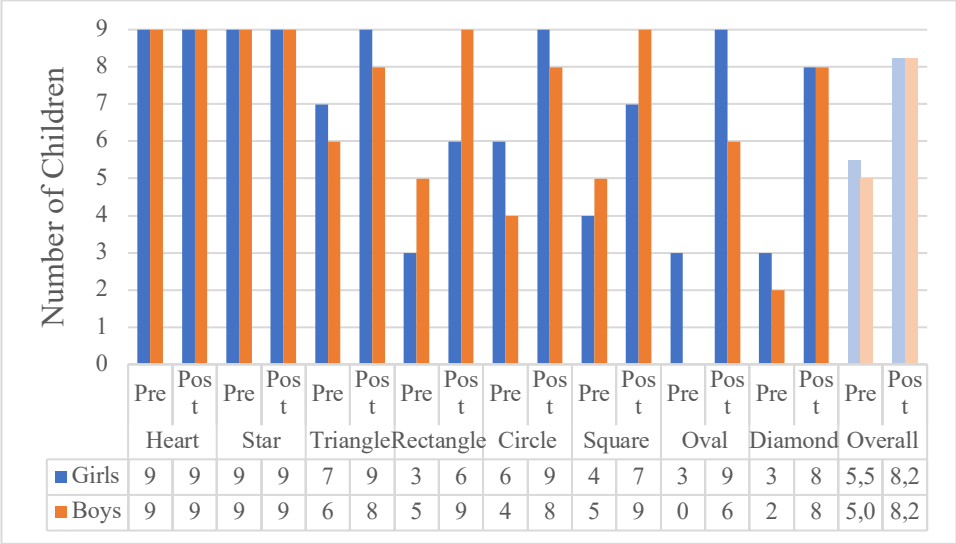


Figure 4. 37. Comparison of the Pre-post Findings Regarding Receptive Skills in Terms of Shapes by Gender

Figure 37 demonstrates that before the implementation, all girls successfully identified the heart and star shapes, whereas none of the boys could identify all shapes. Among the girls, eight correctly identified the triangle and circle shapes, 6 recognized the rectangle, 5 recognized the square and oval shapes, and 4 recognized the diamond shape. In contrast, among the boys, 8 recognized the heart and star shapes, 7 identified the rectangle, 6 recognized the triangle, 5 identified the square, 4 recognized the circle, and only 2 recognized the oval and diamond shapes. These findings display that girls generally exhibited higher proficiency in receptive skills related to shapes before the implementation.

All children successfully recognized the heart and star shapes. All girls correctly identified the triangle and circle shapes; 8 recognized the rectangle, diamond, and oval shapes, and 7 recognized the square shape after the implementation. All the boys correctly identified the heart, star, and rectangle shapes; 8 recognized the circle, diamond, and triangle shapes, and 7 identified the square and oval shapes. These results indicate remarkable progress in both genders following the implementation, with boys demonstrating considerable improvements in shapes where their initial performance was lower, particularly in the diamond and oval shapes, where substantial advancements were observed.



	Heart		Star		Triangle		Rectangle		Circle		Square		Oval		Diamond		Overall	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Girls	9	9	9	9	7	9	3	6	6	9	4	7	3	9	3	8	5,5	8,2
Boys	9	9	9	9	6	8	5	9	4	8	5	9	0	6	2	8	5,0	8,2

Figure 4. 38. Comparison of the Pre-post Findings Expressive Skills in Terms of Shapes by Gender

In Figure 4. 38, all girls and boys successfully named the heart and star shapes before the implementation. Among the girls, seven girls accurately named triangles, six girls named circles, four girls named squares, and three correctly named rectangles, ovals, and diamonds. For the boys, six boys correctly named triangles, five boys named both rectangles and squares, four boys named circles, and only two boys named diamonds correctly. Notably, none of the boys could name the oval shape before the EP activities, indicating a specific challenge with this shape.

Following the EP activities, there were remarkable improvements in naming accuracy for both genders. All girls and boys continued to name the heart and star shapes correctly. All girls also accurately named triangles, circles, and ovals, with eight girls correctly naming diamonds and seven girls naming squares. Among the boys, all nine boys accurately named squares and rectangles, eight boys named triangles, circles, and diamonds, and six boys successfully named ovals, marking a notable enhancement from no correct naming of ovals before the implementation.

4.7.4. Children's Environmental Print Preferences, Average Time Spent, and Receptive, Expressive Skills Observed in the Learning Center by Gender

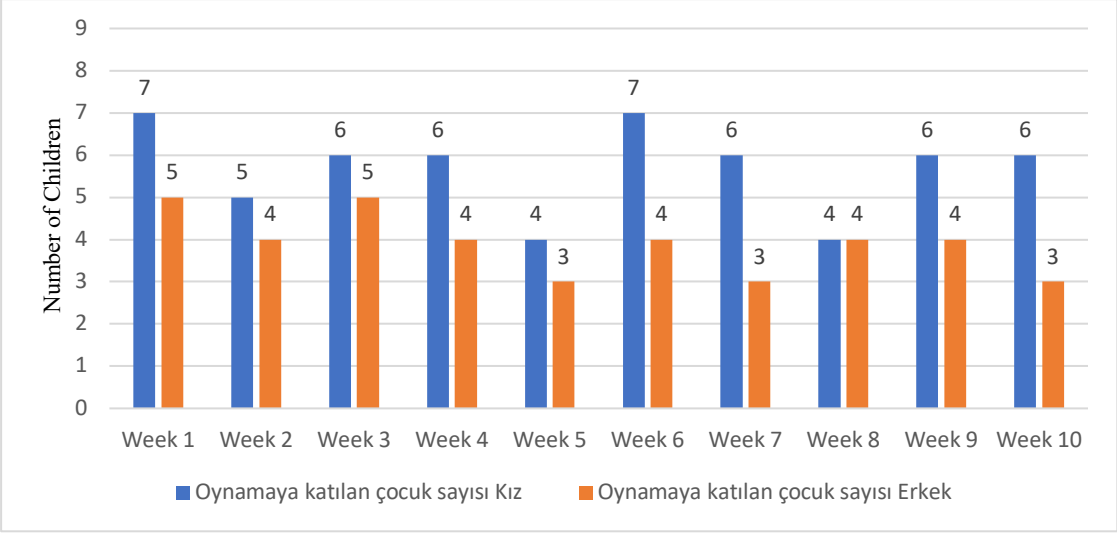


Figure 4. 39. Distribution of Children's Preference for EP Learning Center During Free Play Time by Gender

Figure 4.39 shows the preference of children for the EP learning center during free play tie, based on gender. In other words, the distribution of children interacting with EPs in the learning center over ten weeks is shown according to their gender. In week 1, seven girls and five boys participated in activities at the EP learning center. This trend continued, with girls showing higher participation than boys in several weeks, such as weeks 2,3,4,5,6,7,9 and 10. However, the participation rates fluctuated slightly each week.

Overall, the bar graph demonstrates that girls consistently preferred the EP learning center more during free play time across the observed period.

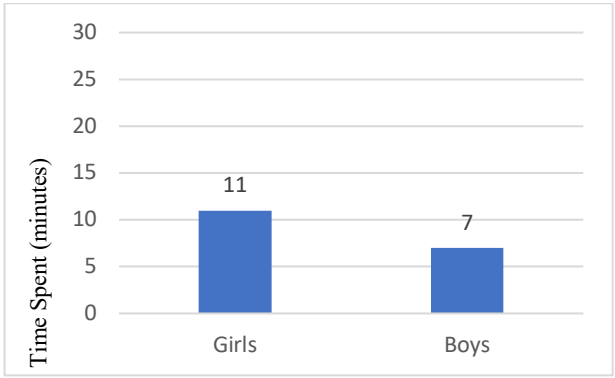


Figure 4. 40. Average Time Spent (minutes) in the EP Learning Center by Gender

Figure 4.40 indicates the average time spent in minutes by children in the EP learning center during free play time, categorized by gender. The data reveals that girls spent an average of 11 minutes in the EP learning center, whereas boys spent an average of 7 minutes. This indicates that girls engaged with the EP learning center longer than boys over the ten weeks. The higher average time for girls displays a greater interest or engagement in EPs provided by the EP learning center.

As illustrated in Figure 4.41 demonstrates the distribution of observed receptive, expressive skills in the EP learning center, specifically focusing on receptive and expressive skills in terms of colors and shapes, categorized by gender. The graph highlights the percentage of children whose receptive and expressive skills were observed during activities in the learning center, with a clear comparison between boys and girls.

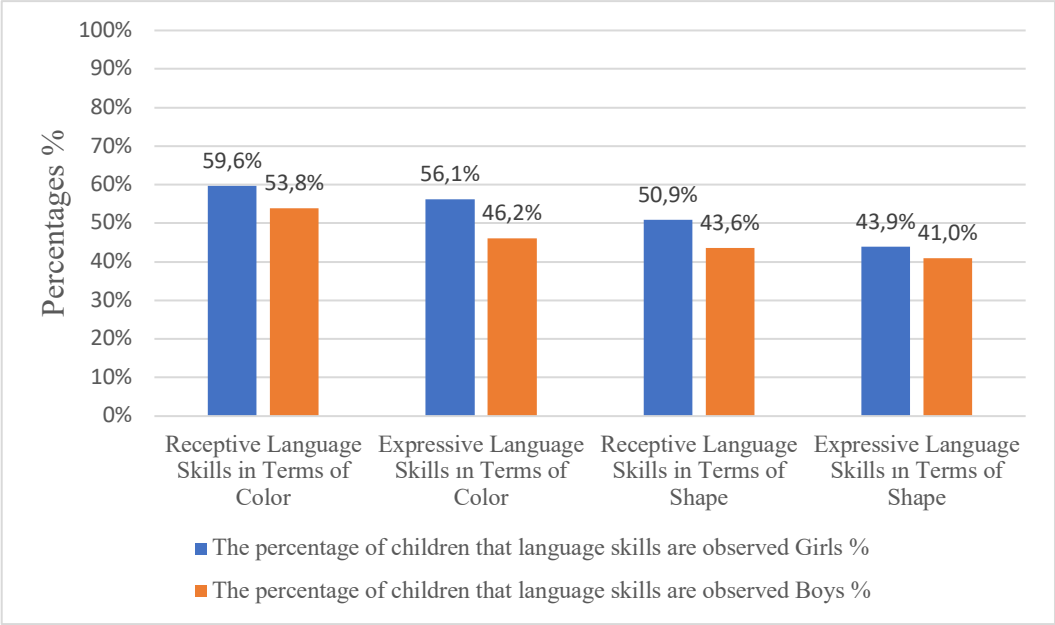


Figure 4. 41. Receptive, Expressive Skills Observed in the EP Learning Center by Gender

For receptive skills related to color recognition, the chart indicates that 59.6% of girls demonstrated these skills, compared to 53.8% of boys. Regarding expressive skills related to color, 56.1% of girls exhibited these skills, whereas 46.2% of boys did. This demonstrates that girls generally showed stronger receptive, expressive skills concerning colors, both in recognizing and naming them, during the observed activities.

When focusing on receptive skills related to shapes, 50.9% of girls displayed these skills, compared to 43.6% of boys. Similarly, for expressive skills concerning shapes, 43.9% of girls exhibited these skills, while 41.0% of boys did. Although the differences between genders are less pronounced in the context of shapes than colors, girls still slightly outperformed boys in receptive and expressive skills during the learning center activities.

4.8. Summary of the Findings

4.8.1. The Children's Logographic Reading Skills Pre-test Results

According to logographic reading pre-test results, children exhibited high proficiency at Level 1, with approximately half of the group scoring above 40% compared to

more challenged levels. Although there was a slight decline in proficiency at Level 2, the scores generally paralleled those observed at Level 1. However, a notable score reduction was evident at Level 3, where only a few children scored above 20%, highlighting the difficulties posed by the absence of a product context. At Level 4, where color cues were removed, children's logographic reading skills declined further, with the majority scoring below 15%. Ultimately, Level 5 presented the greatest challenge, with all children struggled to score, indicative of the substantial difficulty encountered at this stage.

4.8.2. The Children's Logographic Reading Skills Post-test Results

According to logographic reading post-test results, post-test results of children across five levels show that in Level 1, most children achieved success rates above 50%. In contrast, in Level 5, success rates notably declined, with most children demonstrating low performance. Overall, the success rates tend to decrease as the level increases, indicating that higher-level logographic reading skills is more challenging for the children. The highest success rates were achieved in Levels 1 and 2, indicating that children performed better on reading logographically at these levels. In contrast, Level 5 exhibited lower success rates, displaying that the children's logographic reading skills at this level posed greater difficulty.

4.8.3. The Comparison of Children's Logographic Reading Skills

According to the comparison of logographic reading pre-and post-test results, remarkable enhancements were stated in children's logographic reading skills across all levels. Levels 3 and 4 exhibited the most notable improvements, with success rates increasing from 12.2% to 51.4% and from 9.3% to 46.5%, respectively. Although Level 5 presented considerable challenges, there was an increase in the success rate from 0.0% in the pre-test to 5.4% in the post-test.

4.8.4. Findings from Environmental Print Learning Center Observations

According to observation findings, children's participation in the Environmental Print (EP) learning center fluctuated over ten weeks. In the first week, they had the

highest participation, with 12 children participating. Similarly, in the third and sixth weeks, 11 children participated. In contrast, they had the lowest participation in the fifth week, with only seven children involved. This indicates that the attractiveness of the EP learning center and children's interests varied over time.

Observations of logographic reading skills indicate that children most frequently demonstrated skills at Levels 1 and 2 throughout the weeks. These levels were particularly shown in Weeks 1 and 10, where they were exhibited five times each. Level 3 was typically demonstrated two to three times per week but was less common overall. Level 4 was observed once or twice weekly, indicating that fewer children reached this advanced stage. The most advanced skill, Level 5, was rarely exhibited, with no occurrences in most weeks. These findings display that while children regularly displayed lower-level logographic reading skills, progression to more advanced levels were less common.

Over the ten weeks, children's receptive and expressive skills related to color and shape concepts were observed at varying frequencies. Receptive skills for color were the most frequently exhibited, with the highest occurrences recorded at 9 and 7. In contrast, receptive skills for shape were observed less often, with the highest occurrence being five instances in Weeks 1, 4, and 6. Expressive skills for color were consistently demonstrated, peaking at seven instances in Week 6. However, expressive skills related to shape were the least frequently observed, with the highest frequency recorded at only four instances in Week 4. These findings reveal that children's receptive, expressive skills associated with color concepts were demonstrated more regularly and frequently than those related to shape concepts throughout the sessions.

4.8.5. Pre-findings Emerged from the Mothers' Interviews

According to findings from pre-interviews with mothers, four main sub-themes emerged that are recognizing original products with EP (N_M =9), recognizing a colored photograph of the original product with EP (N_M =7), recognizing only the EP even without the product present (N_M =4), and recognizing EP in black-and-white

and plain text forms (N_M=2). Some mothers reported that their children could read the environmental print on the original product at a logographic reading level, specifically at Level 1. Some mothers also reported their children could recognize the EP in a colored photograph. However, some mothers stated that their children could not read the name of the environmental print or logo, but they could tell what the product was based on the context of the product. Only two mothers reported that their children could recognize EP in black-and-white format, specifically at Level 4. These findings also revealed the role of environmental prints on receptive, expressive skills. Two sub-themes emerged: the ability to identify and show colors (N_M=7) and the ability to identify and show shapes (N_M=5). Most mothers claimed that their children had receptive and expressive skills in terms of color, while only three mothers reported that their children may confuse some colors from time to time. Most mothers reported that their children mostly interacted with environmental prints, initiating conversations about logographic reading proficiency.

4.8.6. Post-findings Emerged from the Mothers' Interviews

According to the post-interviews, the environmental print (EP) activities notably impacted children's logographic reading development. Most mothers observed that their children's ability to recognize and interpret EPs improved notably after the activities. This increase in logographic reading skills was reflected in their interactions with various types of EPs, ranging from logos and symbols to more complex representations in their surroundings.

The findings also showed a heightened curiosity and interest in EPs, as reported by most mothers. Children were more aware of EPs and demonstrated greater enthusiasm for identifying and discussing these elements in their everyday environments. This engagement extended beyond simple recognition, with children showing an increased interest in the details, such as the colors, shapes, and letters that make up these prints. Furthermore, the interviews indicated a relationship between EP activities and children's motivation to learn to read. Many mothers noted that their children became more eager to explore letter names and their sounds.

4.8.7. Comparison of the Findings of Pre-Post Interviews with Mothers

According to findings from comparing pre- and post-interviews with mothers, recognizing environmental prints (EPs) increased children's logographic reading skills at all levels. This increase was observed when EPs were presented in context, with almost all children succeeding at the first and second levels of logographic reading. The number of children exposed to black-and-white EPs was reported to increase in logographic reading skills post-interview, but this increase involved less than half of the children participating in the study. Furthermore, according to the mothers, the number of children who can identify and show color under the role of EPs on receptive and expressive skills theme has increased from 7 to 13 and from 5 to 11. Moreover, child environmental print interaction showed a remarkable rise in the frequency of children's engagement with EPs, with the number of children frequently interacting with EPs increasing from 11 initially to 17 post-interviews. The variation of these interactions was substantial, with initially only five children engaged with EPs, a figure that rose to 16 by the time of the post-interviews. In the post-interview, the sub-theme '*Perceptions of Children's Learning Outcomes'* emerged, which differed from the pre-interview. These sub-themes include recognizing more environmental prints at various logographic reading levels, increasing interest in environmental prints, increasing the desire to identify and demonstrate colors and shapes daily, and increasing motivation for learning letters and sounds.

4.8.8. Pre-findings Emerged from the Teacher's Interview

According to findings from the pre-interview with the class teacher, over half of the children can logographically read environmental prints (EPs) when they are on original products or depicted in colored photographs. However, only 3 to 4 children can demonstrate logographic reading proficiency if the EP is displayed without the context of the original product. Additionally, only 1 or 2 children might show logographic reading proficiency if the EP is presented in a black-and-white format without color cues. The teacher also noted that children generally struggle with primary colors but sometimes struggle with secondary ones. They were less

successful in shapes and confused some shapes. The teacher observed that most children engage with EPs inside and around the school environment. When children encounter EPs, they are generally eager to ask questions about what the EP says, focusing on what was written on the EPs that caught their interest and meaning.

4.8.9. Post-findings Emerged from the Teacher's Interview

According to post-findings that emerged from the teacher's interview, she revealed several key themes. These interviews replicated the same questions as the pre-interviews, adding four new questions designed to identify specific changes in the classroom environment. The findings highlighted how children's interactions with environmental prints (EPs), such as logos and symbols, became more frequent and detailed after implementation. A key theme from the interviews was *"Perceptions of Children's Learning Outcomes*," indicating that children had gained increased skills of basic features like colors and shapes. Sub-themes included various levels of recognizing EPs, from identifying original products with EPs to recognizing EPs in plain text form, illustrating a spectrum of logographic reading development.

Moreover, the final teacher interview revealed the theme *"The Role of Environmental Prints on Receptive, Expressive Skills related to Colors and Shapes,"* with sub-themes related to children's abilities to recognize and demonstrate colors and shapes. The interview findings indicated that children were proficient in distinguishing primary and secondary colors and showed fewer errors in shape recognition, improving both receptive and expressive skills. Additionally, the post-interview findings identified another important theme: "*Children-Environmental Print Interaction."* This theme encompassed two sub-themes: "*The content of the children-EP interaction*" and "*The frequency of the children-EP interaction."* The teacher noted that children frequently engaged with EPs and actively discussed these prints' color and shape elements. Finally, the post-interview findings introduced four new questions do not present in the initial interview, leading to findings related to children's learning outcomes. These findings revealed an increasing interest in early writing, more frequent recognition of EPs during free play, and a growing motivation

to learn letters and sounds, reflecting the broader impact of the implementation on emergent literacy skills.

4.8.10. Comparison of the Findings of Pre-Post Interviews with Teacher

According to findings from the comparison of pre-and post-interview with the teacher, the children's logographic reading proficiency increased while representing original products with EP (Level 1), colored photographs (Level 2), only the EP without the product present (Level 3), recognizing EP in black-and-white (Level 4), and recognizing EP in plain text forms (Level 5). The teacher also noted the number of children who could identify, showing increased colors and shapes. In the post-interview, the class teacher observed an improvement compared to before the EP activities, with almost all the children knowing primary and secondary colors. The child-environmental print (EP) interaction content and frequency also emerged from the pre-interview. The teacher observed a noticeable increase in the number of children who could demonstrate logographic reading proficiency and receptive and expressive skills, with children actively engaging with and discussing color and shape elements associated with the environmental prints. Finally, the teacher's final interview revealed findings related to children's learning outcomes, including an increasing desire for early writing, recognizing environmental print in free play time, and increasing motivation for learning letters and sounds.

4.8.11. Pre-findings Emerged from the Checklists Filled by the Teacher

According to pre-findings from the checklist, children demonstrated strong receptive and expressive skills for specific colors and shapes, while others presented challenges. All children successfully recognized and named the colors black and pink, indicating a high level of familiarity. However, fewer children recognized and expressed colors such as blue, yellow, and mainly gray, highlighting some variability in their ability to process and verbalize these colors. Regarding shapes, all children were able to recognize and name familiar shapes like hearts and stars, showing strong proficiency in these areas. However, the recognition and expression of more complex shapes, such as triangles, rectangles, circles, squares, diamonds, and ovals, were less consistent. In particular, the diamond and oval shapes proved to be the

most difficult for children, as only a small number could correctly identify and name these shapes.

The comparison between receptive and expressive skills for both colors and shapes reveals that children's receptive skills are generally stronger than their expressive skills. For colors, while children displayed strong receptive skills, they encountered more difficulty expressing certain colors, particularly gray. Similarly, while receptive skills were strong for basic shapes, expressive skills lagged, especially for complex shapes like diamond and oval.

4.8.12. Post-findings Emerged from the Checklists Filled by the Teacher

According to the post-findings that emerged from the checklists, children's receptive skills related to colors are generally substantial, with all children successfully recognizing the colors black, pink, red, blue, white, orange, and gray. However, slightly fewer children demonstrated proficiency in recognizing yellow, green, and purple, displaying minimal variation in color recognition skills. Regarding expressive skills, most children could name these colors, though some encountered challenges, specifically with green and gray. When comparing receptive and expressive skills for colors, children’s receptive skills are more developed than their verbal skills to express certain colors—the challenges encountered with green and gray highlight areas where expressive skills lag behind receptive skills. Regarding shapes, all children successfully identified heart and star shapes, but slightly fewer were proficient in recognizing triangle, rectangle, and circle shapes. Recognition of shapes like diamonds, ovals, and squares further decreased. This reveals that while children's shape recognition skills are generally substantial, they vary across shapes, particularly for squares and ovals. In expressive skills related to shapes, while children could express heart, star, and triangle shapes, there were difficulties expressing shapes like circles, squares, diamonds, rectangles, and ovals. The data highlights that children are more proficient in recognizing shapes than expressing them, with specific challenges in articulating certain shapes, especially rectangles, diamonds, and ovals.

4.8.13. A Comparison of the Findings Emerged from the Checklists Filled by the Teacher

According to the results of the checklist, comparing the children's receptive and expressive skills on colors and shapes indicated a notable enhancement in recognizing and naming colors. Initially, all children recognized black, pink, and red, with post-test recognition extending to blue and white. The most notable progress was seen with the color gray, where children's ability to identify and name it improved considerably. It has also demonstrated remarkable improvement in the children's recognition and naming of various shapes. Heart and star shapes were initially the most easily recognized and named shapes, and this trend continued in the post-test. The most remarkable improvements were observed in the recognition and naming of oval and diamond shapes, with a notable increase in the number of children correctly identifying and naming these shapes.

4.8.14. Children’s Logographic Reading Skills and Receptive, Expressive Skills on Colors and Shapes in Terms of Gender

4.8.14.1. Children’s Logographic Reading Skills by Gender

Logographic reading pre-and post-test results regarding gender revealed the progress of boys and girls across different levels of logographic reading tests, revealing notable improvements in post-test success rates for both groups. At Level 1, boys and girls showed similar improvements, with boys progressing from 36.1% to 68.3% and girls from 35.8% to 68.9%. At Level 2, the success rates also became comparable in the post-test, with boys improving from 40.3% to 66.9% and girls from 34.4% to 66.1%. Girls generally outperformed boys in the more challenging levels (3, 4, and 5). At Level 3, girls improved from 14.2% to 55.3%, while boys went from 10.3% to 47.5%. Similarly, at Level 4, girls increased from 10.6% to 49.7%, whereas boys progressed from 8.1% to 43.3%. At the most challenging Level 5, both groups started with a 0.0% success rate, but girls achieved 7.2% in the post-test compared to boys' 3.6%. Overall, the findings show that while both boys and girls made remarkable progress, girls consistently outperformed boys, particularly at higher difficulty levels.

4.8.14.2. Children's Receptive and Expressive Skills on Colors and Shapes by Gender

According to the results of the checklist regarding gender, before the implementation process, all girls successfully identified purple, while all boys successfully identified the colors blue, yellow, and white. After the implementation, all children correctly identified the colors black, pink, red, blue, white, purple, orange, and gray, with 88.8% of girls also identifying yellow and green, and all boys succeeded in identifying all colors. For expressive skills, girls showed a broader range of color proficiency in red, purple, and orange, whereas boys had lower success rates in various colors. After the implementation, boys succeeded in all colors, particularly showing considerable improvement in gray, where they were initially weak.

According to the results of the checklist in terms of gender, before the implementation process, girls demonstrated higher proficiency in both receptive and expressive skills for shapes than boys. All girls recognized the heart and star shapes accurately, while boys showed lower success rates across various shapes, particularly with diamonds and ovals. After the EP activities, both genders exhibited notable improvements, with boys showing remarkable progress in identifying and naming previously challenging shapes like diamonds and ovals. Despite this progress, girls continued to outperform boys in overall shape recognition and naming accuracy.

4.8.14.3. Children's Environmental Print Preferences, Average Time Spent, and Receptive, Expressive Skills Observed in the Learning Center by Gender

According to observation findings, the distribution of children interacting with Environmental Prints (EPs) in the learning center over ten weeks was categorized by gender. Girls consistently participated more than boys, with higher engagement. Although participation rates fluctuated slightly each week, girls maintained a stronger preference for the EP learning center during free play time throughout the entire period. Moreover, the findings demonstrate that girls engaged more with the EP learning center, spending an average of 11 minutes compared to 7 minutes for boys, indicating a higher level of interest or engagement in EP activities throughout

the 10-week observation period. Regarding language skills related to color recognition, girls outperformed boys, with 59.6% of girls demonstrating receptive skills compared to 53.8% of boys and 56.1% of girls displaying expressive skills compared to 46.2% of boys. While the gender differences were less obvious in the context of shapes, girls still demonstrated slightly higher proficiency. Specifically, 50.9% of girls exhibited receptive skills related to shapes, compared to 43.6% of boys, and 43.9% of girls showed expressive skills, compared to 41.0% of boys. These results indicate that girls consistently outperformed boys in receptive and expressive skills, particularly in the recognition and naming of colors.

CHAPTER 5

DISCUSSION, EDUCATIONAL IMPLICATIONS, AND RECOMMENDATIONS FOR FURTHER RESEARCH

The findings related to the research questions were covered in this section of the thesis. First, to accomplish this goal, findings in response to the first research question, which explored children's levels of logographic reading skills and their receptive, expressive skills on colors and shapes, were addressed based on the literature.

Following the synthesis of these findings, a discussion was provided in light of the existing literature and the theoretical framework, offering a comprehensive analysis of how the results aligned with or diverged from previous research and theoretical perspectives in the field.

Secondly, the impact of environmental print activities conducted with children may affect those logographic reading and receptive, expressive skills on basic colors, and shapes were examined according to the contexts, which are based on the synthesis through a cross-case analysis obtained from pre-post interviews with mothers and teacher, observation form, logographic reading test, and checklist. In the following parts, findings related to the impact of environmental print activities on the children's logographic reading and receptive, expressive skills on colors and shapes concepts of gender were discussed.

All findings of this study were discussed in the extensive literature conducted in different environmental print and emergent literacy investigations. In addition to this, based on the results of the current study, implications for educational practices and recommendations for future research were provided, offering insights for practitioners, families, and researchers in the field of early childhood education.

5.1. Discussion of Findings

5.1.1. Levels of Children's Logographic Reading and Receptive, Expressive Skills on Colors and Shapes

This section aims to demonstrate the children's initial logographic reading levels and receptive and expressive skills on colors and shapes among preschoolers aged 48-54 months before the implementation. The findings were analyzed and discussed in relation to the relevant literature.

In this study, the logographic reading test and pre-interviews with mothers and teacher were employed to explore the levels of logographic reading skills among children before the implementation stage of the study. Initially, the logographic reading tests were administered to the children. After that, pre-interviews were conducted with mothers and teacher to capture their observations of their children's logographic reading skills. The findings from these three data sources were synthesized and presented comprehensively.

The synthesis of findings from various data sources, including pre-interviews with the teacher and the mothers, alongside logographic reading tests, comprehensively demonstrates the impacts of environmental prints (EPs) on children's logographic reading skills across different levels. Children exhibit higher logographic reading proficiency when identifying EPs on original products and their colored photographs at simpler levels, namely Level 1 and Level 2. This observation, confirmed by both teacher and mothers, highlights that over half of the children can effectively recognize EPs at these initial levels. At Level 3, where product context is absent, and at Level 4, where color cues are missing, a remarkable decline in logographic reading proficiency is observed, underscoring visual cues' critical role in supporting logographic reading. These findings align with reports from mothers and the classroom teacher, who noted substantial difficulties faced by children when interacting with EPs devoid of visual and contextual support. The starkest findings emerged at Level 5, where EPs presented in plain text led to all children struggling to recognize the EPs, as the mothers and the class teacher reported. This level, lacking

any graphical elements or color cues, proved exceptionally challenging, highlighting the essential role of visual components in facilitating logographic reading. The synthesis of findings from both the teacher and mother interviews and direct logographic test results clearly shows that children can interact with and understand environmental prints. Thus, their logographic reading skills rely heavily on the presence of visual and contextual cues.

When these results are analyzed within the frameworks of Ehri's (1995) reading model and Frith's (1985) theory of reading acquisition, the findings of the current study provide a detailed understanding of the function of children's logographic reading processes and their role in emergent literacy development concerning environmental prints. Ehri's model (1995) posits that logographic reading occurs before letter-sound analysis, associating this phase with the pre-alphabetic stage. Frith's theory (1985) further contextualizes the logographic stage as the initial phase in literacy development, characterized by the instant recognition of symbols and words without understanding their phonetic components. This study supports these theories, showing that children heavily based on contextual and visual cues like color and shape to recognize environmental prints.

The study also found that children are more capable of reading environmental prints on original products and colored images during the early phase. However, a remarkable decline in logographic reading skills was observed at more complex levels (Levels 3 and 4) where product context or color cues were absent. These findings highlight children's dependency on visual cues for logographic reading, supporting Ehri's (1995) and Frith's (1985) theories on the pre-alphabetic and logographic stages, respectively. In this study, the results from Level 5, where environmental prints are presented in plain text, showed that all children failed to identify environmental prints. This indicates that as children move beyond the logographic stage, their ability to decode environmental print based only on alphabetic principles without contextual support remains limited. This demonstrates that logographic reading is critical before acquiring conventional reading skills based on letter shapes and sounds.

Numerous studies have been conducted to explore how children perceive environmental prints in various versions and how this perception influences their levels of logographic reading. According to previous investigations, the findings from this study extend an understanding of how children read logographically environmental print. Consistent with the related literature on environmental print studies, the current results emphasize that children predominantly focus on environmental rather than textual cues during logographic reading levels. This observation aligns with findings from Zhao, Zhao, Weng, and Li (2014), Beech (2005), Bowman and Treiman (2004), Ehri (1995), Frith (1986), McGee et al. (1988), Reutzel (2003), Goodall (1984), Masonheimer, Drum, and Ehri, (1984); Share and Gur (1999) and Mason's (1980) who collectively underscore that young children often extract meaning from environmental print before mastering alphabetic decoding skills. In this study, children demonstrated enhanced logographic reading proficiency when environmental prints were embedded within original products and their colorful representations at Levels 1 and 2. This study also reveals a remarkable decline in logographic reading proficiency at Level 3, where product context is omitted, and at Level 4, where color cues are absent. This decline highlights the critical role that visual cues play in supporting logographic reading proficiency, as investigated by researchers such as Blair and Savage (2006), Cloer et al. (1981), and Ehri and McCormick (1998). The current study, the challenge in recognizing environmental prints presented in plain text at Level 5, where all children failed to identify the prints, further corroborates the necessity of visual contextual cues for logographic reading. These findings are consistent with Reitzel's (2003) investigation, which demonstrated that the logographic reading skills of children aged 4-7 significantly diminish when environmental print reading is presented without context.

As mentioned above, the results of this study also match well with the research conducted by Zhao et al. (2014), who investigated systematically testing the influence of various cues in EPs on children of different ages; their research highlighted this critical transitional period in reading development. Zhao et al. (2014) investigated children's recognition of familiar environmental prints conducted with children aged 3 to 5 in Chinese. They used four environmental prints (EPs) and

created four versions by gradually reducing contextual cues (such as color, logo, and font type cues) apart from presenting the EPs in the logo format. The researchers discovered that children performed better when words were presented within highly familiar EPs rather than in a plain, context-free manner. Furthermore, they found that the impact of various cues on reading environmental print varied with age. For 3- and 4-year-olds, color and logo cues had a more substantial effect, whereas font type cues were more influential for 5-year-olds. The study revealed an interaction between age and cue type, showing that children of different ages relied on other cues to read words in environmental prints. Younger children were more influenced by color and logo cues, while 5-year-olds were more affected by font type cues. Their findings demonstrated that by age 5, children start to pay greater attention to visual word form information like conventional word reading.

The most frequently cited studies by Masonheimer et al. (1984) and Goodall (1984) are particularly noteworthy in this context. For example, Masonheimer et al. (1984) used environmental prints presented in various contexts: initially on the product, then on a color photo of the label, followed by a black and white photo, and finally in standard manuscript form. As the contextual cues were progressively stripped away, the ability of three- to five-year-old children (N=102) to read the environmental print significantly declined. Most children could not read the environmental print word when displayed in a standard print format. Similarly, Goodall's (1984) study involved 20 children, approximately four years and nine months old, attending the same kindergarten. The study aims to display children's ability to "*read*" or interpret environmental prints (EPs) in their environment. It specifically examined whether preschool children use environmental cues or actual print cues to recognize EPs and how these abilities might influence early reading strategies. The study employed two conditions to test the children's EPs recognition capabilities: one with EPs in full environmental context and another with environmental elements masked to isolate the EPs cues. According to the results, when environmental cues were fully available, the children showed a relatively high capacity to correctly identify EPs, indicating a significant reliance on contextual information. However, when only partial cues were available, their ability to recognize EPs decreased significantly, with a noticeable increase in errors or "*don't know*" responses. This suggests that

four-year-olds heavily depend on environmental cues for EPs recognition and that their ability to identify words based solely on environmental print is limited.

Taken together, following the relevant literature, the findings of the current study are consistent with those of previous research. While prior studies have demonstrated how children develop or vary their logographic reading skills using environmental prints, the current study extends the existing empirical information. Most previous research was conducted abroad, providing insights into the relationship between environmental prints and logographic reading. This study reveals that the findings from the Turkish context align with the international literature. This is significant as the concept of environmental print is sociocultural and may exhibit variations across different countries, cultures, and languages (Snow, 2017). Thus, this study's findings make a valuable contribution to the field by highlighting these contextual consistencies.

Additionally, to answer the first research question, this section seeks to explore children's receptive and expressive skills on basic colors and shapes among children with the help of checklists and pre-interviews with mothers and teacher. First, the checklists were administered to the class teacher. After that, pre-interviews were conducted with mothers and teacher to gather their insights on the children's receptive and expressive skills on colors and shapes. The findings from these three data sources were integrated and presented thoroughly.

The synthesis of findings from interviews with mothers, teacher, and checklist results in the study highlights notable consistencies in children's receptive and expressive skills related to colors and shapes. First, it indicates that children's receptive skills are more developed than their expressive skills. Specifically, with colors, most children demonstrated a high recognition rate for primary colors such as black, pink, red, yellow, and blue, indicating a well-developed visual association. On the other hand, while expressive skills are also strong, there is a noticeable decline in less common colors, such as orange and gray, where expressive skills drop. In contrast, black and pink maintain total success in expressive skills.

Regarding shapes, receptive and expressive skills are not as high as those for colors, with reported confusion among some shapes. These differences may display that children face more challenges in identifying and naming shapes than colors. The findings underscore that while children show high consistency in receptive and expressive skills for primary colors, they encounter difficulties with secondary colors and particular shapes.

These findings were examined through the theoretical frameworks of Piagetian and Vygotskian perspectives, offering complementary explanations. According to Piaget's constructivist theory, children actively participate in learning. They iteratively interact with their environment, assimilating new information and accommodating their knowledge structures to incorporate new experiences (Berk, 2005). This study's high recognition of primary colors reveals that children have effectively assimilated these common visual experiences. This aligns with Piaget's notion that frequent interaction with familiar stimuli leads to more robust cognitive development. Conversely, the decline in expressive skills for less common colors indicates that children may not have encountered these colors as frequently, necessitating more cognitive adjustments or accommodation.

Furthermore, the challenges children face in identifying and naming shapes, compared to colors, can also be understood through Piagetian principles (Piaget, 1962). The lower performance in shape recognition may demonstrate that children have fewer opportunities to engage with various shapes in their environment. According to Piaget, this lack of exposure means children must undergo more complex cognitive processes to accommodate and understand these new forms.

Vygotsky's sociocultural theory also provides a robust framework for interpreting these findings. Vygotsky emphasized the significance of social interaction and cultural context in cognitive development. The Zone of Proximal Development (ZPD) concept highlights the difference between what children can achieve independently and what they can achieve with assistance (Vygotsky, 1978). The study's results, showing higher proficiency in receptive skills for primary colors, display that these tasks fall within the children's ZPD. However, the need for

scaffolding becomes evident when dealing with less common colors and shapes, as children show lower expressive skills in these areas. This indicates that tasks related to less familiar colors and shapes are at the higher end of their ZPD and require external support to master.

The current study's findings indicate that children's receptive skills are more developed than their expressive skills. This result is supported by studies in the literature, including those by Armonia et al. (2015), Capovilla (2006), and Tamis-LeMonda et al. (2006). Data from UNICEF's Multiple Indicator Cluster Survey, based on parent responses from over 100,000 children aged two to ten, revealed that receptive skills are more advanced than expressive skills (Bornstein and Hendricks, 2012). Benedict (1979) explained this result by claiming that receptive skills begin earlier and increase more rapidly than expressive skills.

The findings of this study contribute to early childhood education by explaining the children's receptive and expressive skills in understanding color and shape concepts. The research demonstrates the role of cognitive development and sociocultural context in acquisition in Piagetian and Vygotskian frameworks.

5.1.2. Impact of Environmental Print Activities on Children's Logographic reading skills

This section aims to understand how environmental print activities impact the logographic reading skills of preschoolers aged 48-54 months. It also synthesizes findings from various data sources, including observations, logographic reading tests, and pre-post interviews with mothers and teachers. These findings were analyzed comprehensively to observe changes in children's logographic reading skills and discussed in comparison with the relevant literature.

According to findings from pre-and post-interviews with mothers, remarkable improvements emerged in logographic reading skills related to original products of EPs (Level 1), colored photographs of EPs (Level 2), and just the EP form without context (Level 3). Mothers reported enhanced awareness and proficiency in their

children's logographic reading skills at these levels in the post-interviews. However, fewer children demonstrated improvements in logographic reading skills for EPs in black-and-white (Level 4) and plain text formats (Level 5). These findings align with data from interviews with the class teacher. Comparative analysis of pre-and post-interviews with the teacher reveals that the EP activities benefited children across all levels of logographic reading skills. Consistent with findings from interviews with mothers, notable increases were noted at the more logographic reading levels (Levels 1, 2, 3). Still, fewer children showed improvement in the black-and-white form of EPs (Level 4), and only 1-2 children displayed advancement in *"Recognizing EP in Plain Text Forms"* (Level 5), with the majority not displaying notable improvement.

These qualitative findings are consistent with logographic reading pre-and post-test results from the children. According to logographic reading pre-and post-test results, children's logographic reading skills improved notably across all levels. Success rates increased from 36.0% to 68.6% at Level 1 and from 34.7% to 66.5% at Level 2. The most considerable improvements were observed at Levels 3 and 4, with success rates rising from 12.2% to 51.4% at Level 3 and 9.3% to 46.5% at Level 4. At Level 5, while the pre-test success rate was 0.0%, it rose to 5.4% in the post-test. The least progress was seen at Level 5, the most challenging level. A slight discrepancy is evident at Level 4 when comparing qualitative data from mothers and teachers with logographic reading test results. According to qualitative data, mothers and teacher observed increased children's logographic reading skills at Level 4, although not as substantial as the logographic reading test indicated. However, a review of the qualitative data reveals that, according to statements from mothers and the class teacher, children were less exposed to the black-and-white format of EPs in daily life compared to other levels, and this situation may not create an observable condition for mothers and teacher. For instance, in the interviews, the mothers highlighted that they had not experienced situations where they could observe their children's responses at Level 4. These findings are highly compatible with the rates at which children demonstrated logographic reading skills at the EP learning center over ten weeks. According to observation data, the average performance of children playing at the EP learning center during free playtime, in terms of logographic reading skills, was most to least from Level 1, Level 2, Level 3, and Level 5. Specifically for Level

5, children showed no logographic reading in most weeks, indicating challenges at this level.

Overall, the current study's findings indicate that, compared to before the implementation, all children's logographic reading skills improved across all levels of environmental prints. Furthermore, it was observed that children engaged more frequently with environmental prints and interacted more extensively with their colors and shapes.

These findings are consistent with previous studies that demonstrated the effects of instructional use of environmental print in emergent literacy skills (Giacovazzi, Moonsamy, and Mophosho, 2021; Neumann et al., 2013; Prior, 2003; Vera, 2007; Neumann and Roskos, 1993; Wepner, 1985). For instance, Neumann et al. (2013) conducted a pre-post randomized control study examining the effects of an eight-week environmental print intervention in a preschool setting. The study found that children in the environmental print group outperformed the control group in environmental print reading, letter-sound knowledge, letter writing, print concepts, and print motivation. Moreover, Prior (2003) investigated the effects of environmental print reading and letter knowledge. The study found that both treatment groups demonstrated improvements in environmental print reading compared to the control group. Children from lower socioeconomic backgrounds also showed greater enthusiasm for the environmental print program.

Furthermore, Vera (2011) conducted a study on the impact of environmental print in enhancing alphabet awareness and environmental print reading over nine weeks with 56 preschoolers in a low-income area. The treatment group exposed to environmental print utilized logos familiar to the children, while the control group engaged with children's names, calendars, and alphabet books. The results indicated that the treatment group exhibited significantly better alphabet knowledge and environmental print reading outcomes than the control group.

Vera (2011) and Prior (2003) highlighted limitations arising from a restricted set of emergent literacy measures and the absence of random assignment to the groups.

These constraints have underscored the need for careful consideration when discussing their findings with those of further research in this field. In this context, it is evident that the results of the current study, conducted as an explanatory case study, are consistent with those earlier findings. This consistency supports the significance of environmental print in influencing emergent literacy in terms of logographic reading, particularly when examined through a comprehensive methodological approach.

From a sociocultural viewpoint, this research and current study affirm Vygotsky's (1978) theory of scaffolding, illustrating how environmental print serves as a supportive tool in children's initial literacy experiences within real-world contexts. Scaffolding, as a process, employs various tools and methods to aid children in learning activities that would be challenging without such support. Notably, the active involvement of teacher in literacy-rich play environments has a marked influence on children's capabilities to recognize and label environmental print and functional items, highlighting the critical role of adult interaction in these settings. Furthermore, the engaging nature of this freely available resource notably contributes to emergent literacy development through guided interactions by adults, as supported by studies from Neuman and Roskos (1993), Neumann et al. (2012), Prior and Gerard (2004), Vera (2011), and Vukelich et al. (2008).

5.1.3. Impact of Environmental Print Activities on the Children's Receptive and Expressive Skills on Colors and Shapes

In this part, the objective is to examine the influence of environmental print (EP) activities on the receptive and expressive skills on colors and shapes among preschoolers aged 48-54 months. Data was gathered from pre-post interviews with mothers and class teacher and results from a Basic Concept Knowledge Checklist and observations. The findings from these various sources were integrated and discussed concerning the existing literature.

According to the findings obtained from the pre-and post-interviews conducted with mothers, it was reported that their children's receptive and expressive skills to

recognize and name both colors and shapes notably improved following the environmental print (EP) activities. Compared to the period before the implementation, fewer mothers reported confusion regarding colors and shapes in their children. These findings align with the results obtained from interviews conducted with teacher. The class teacher observed improvements in a substantial portion of children concerning these skills compared to the before EP activities and noted that children could recognize and name primary and secondary colors. Additionally, the teacher stated that children excelled particularly in color recognition regarding receptive and expressive skills and made fewer mistakes regarding confusing shapes. The results obtained from comparing the checklists filled out by the teacher before and after the intervention agree with the qualitative findings, providing a detailed account of these improvements. Observational data supporting the checklist results clearly show how frequently children demonstrated receptive and expressive skills on colors and shapes, indicating that they exhibited these skills related to colors more regularly than those related to shapes.

Taken together, these results indicate remarkable progress in children's receptive and expressive skills concerning colors and shapes. In this context, through the 20 EP activities conducted with the children, the most notable improvement was observed in their expressive skills related to the concept of shapes, followed by their receptive skills.

According to Piaget, the construction of knowledge is fundamentally influenced by context and experience, and these elements are crucial for understanding how children interact with environmental print. Piaget's cognitive developmental theory posits that children construct their learning through interactions and experiences within their environment (Piaget, 1962). The improvement in children's abilities to recognize (receptive skills) and name (expressive skills) colors and shapes, as employed in this study, can be attributed to the frequent and meaningful interactions with environmental print, which provided a rich context for learning. The concept of schemas in Piaget's theory (1962) is particularly relevant in this research. Children's encounters with environmental print allowed them to develop their cognitive schemas related to colors and shapes continuously. Through assimilation and

accommodation, the adaptation process enabled children to integrate new information from environmental print into their existing cognitive frameworks. For instance, when children saw a red color (e.g., ALGİDA), they assimilated this new information into their schema of *"red"* objects. When they encountered a triangle shape, such as a triangle on the milk box label (e.g., PINAR), they accommodated their schemas to incorporate this new knowledge. This dynamic schema development process shows how environmental print is a supportive tool for cognitive development.

Moreover, the current study's findings related to expressive skills showed the most remarkable improvement, followed by receptive skills, highlighting the active role of children in constructing meaning from their environment, a core principle of Piaget's theory (Berk, 2005). By engaging with colorful and graphically appealing environmental prints, children were not merely passive recipients of information but were actively categorizing and making sense of their experiences. This active engagement when encountering new environmental prints necessitated cognitive adjustments, facilitating deeper learning and schema expansion.

These findings support the theoretical framework proposed by Piaget, demonstrating that environmental print, as an experiential learning tool, effectively enhances cognitive and language development in early childhood. The alignment between the empirical results and Piaget's cognitive developmental theory (1962) underscores the importance of incorporating activities with environmental print into preschool settings to foster emergent literacy and cognitive development.

Previous studies involving intervention programs utilizing environmental print have demonstrated there was a significant difference in children's receptive skills by pre-post results, with moderate to large effect sizes (Kumaş, 2021; Neumann et al., 2013; Prior, 2003; Salewski, 1995; Vera, 2011; Wepner, 1985). This finding demonstrates the influence of environmental print on receptive skills. The results of the present study align with existing literature, which displays that activities incorporating environmental print are beneficial for children's receptive skills. For instance, Kumaş (2021) conducted a quasi-experimental study to enhance children's early literacy

skills from low socioeconomic backgrounds through interaction with environmental print. The results revealed that environmental print practices notably supported the receptive skills of children from low socioeconomic backgrounds.

The current study extends the scope of previous research by investigating the effects on receptive and expressive skills, thereby contributing to the existing literature. Specifically, the study focused on environmental print's colorful and uniquely engaging graphical characteristics, including shapes and vivid colors. It integrated these elements into environmental print activities designed to support children's receptive and expressive skills with the help of color and shape concepts knowledge. This approach facilitated the exploration of whether activities with environmental print contribute to the development of receptive and expressive skills in children. These findings highlight that the distinctive features of environmental print, when employed in educational activities, play role in supporting the development of emergent literacy skills.

5.1.4. Impact of Environmental Print Activities on the Logographic Reading and Receptive, Expressive skills on Colors and Shapes inTerms of Gender

This section explores the impact of environmental print activities on the logographic reading skills and basic concept knowledge of colors and shapes in 48- to 54-month-old preschoolers, focusing on gender differences. In this context, the research question addressed is: A synthesis of findings from the data sources, including observations, checklists, and logographic reading tests, was presented to answer this question. These findings were discussed in relation to the existing literature, providing a detailed analysis of how environmental print activities impact children's logographic reading and receptive, expressive skills regarding gender.

The synthesis of findings from various data sources indicates that girls consistently outperformed boys and made greater progress concerning logographic reading proficiency. The pre-and post-test results for logographic reading revealed that girls were more successful than boys at all levels, particularly at the more challenging levels (3, 4, and 5), demonstrating more excellent proficiency in logographic reading

among girls. The checklist results show that all children correctly identified (receptive skills) most colors, with boys showing remarkable improvement. Similarly, the checklist results for shape recognition (receptive skills) indicated that girls initially had higher proficiency in receptive and expressive skills. After the EP activities, both genders displayed remarkable progress; however, girls continued to exhibit superior performance in overall shape identification and naming accuracy despite boys making notable improvements in previously challenging shapes. Observational data further supported these findings, revealing that girls participated more in the EP learning center and exhibited higher percentages of receptive and expressive skills related to colors and shapes.

Considerable investigations have been conducted on gender differences in children's emergent literacy skills. While certain researchers have posited that gender is crucial in influencing emergent literacy skills, other scholars have contended the contrary. Many scholars argue that girls outperform boys and acquire literacy skills faster during early childhood (Below et al., 2010; Deasley et al., 2018; Harper and Pelletier, 2008; Lee and Al Otaiba, 2015). Specifically, significant gender differences have been found in areas such as letter-sound knowledge (Sigmundsson et al., 2017), vocabulary development (Huttenlocher et al., 1991), early writing (Puranik et al., 2013; Işıkoğlu Erdoğan et al., 2015), phonological awareness (Lundberg et al., 2012) and print awareness (Eriksen, Ofteland vand Haga 2017; Karaman, 2013; Moss and Washbrook, 2016) among preschool children, with findings consistently favoring girls. On the contrary, numerous studies claim that print awareness skills acquired by children do not differ based on gender (Matthews, Ponitz, and Morrison, 2009; Tafa, 2009; Kelman, 2007; Harper and Pelletier, 2008). The question of whether there are gender differences in early language acquisition remains a controversial issue. Rinaldi, Volterra, Caselli, and Pasqualetti (2021) aimed to investigate the effects of gender on early language acquisition and emergent literacy skills, specifically to determine if an advantage for girls exists and at what age it emerges. According to the findings of their study, biological factors (e.g., different maturation rates), neuropsychological factors (e.g., different cognitive strategies in task-solving), and cultural factors (e.g., differences in parental social interactions with boys and girls) interact with gender to create reciprocal cycles. Therefore, the researchers

recommend that gender-related findings be discussed, and if differences exist, these might be clarified. In this context, the current study was discussed alongside other studies.

In the emergent literacy literature, numerous studies have examined the use of environmental prints and their impact on children's logographic reading skills (Giacovazzi, et al., 2021; Neumann et al., 2013; Prior, 2003; Vera, 2007; Neumann and Roskos 1993; Wepner, 1985, Kumaş, 2021; Prior, 2003; Salewski, 1995; Kassow, 2006; Reutzel, 2003; Goodall, 1984; Masonheimer et al., 1984; and Mason, 1980). However, only a few studies (Cronin et al., 1999; Jamal, Eman, Kholoud, 2016) have focused on the influence of gender on children's logographic reading or receptive and expressive skills.

Cronin et al. (1999) argued that gender differences in emergent literacy acquisition might begin with environmental print experiences. Using two main procedures, the researchers conducted a study with children aged between 4 years, six months, and five years and four months from middle-class backgrounds. According to the findings, girls who initially identified or logographically read more environmental prints were also more successful in learning EPs than boys. Additionally, it was found that girls learned more EPs during the trial process than boys through these methods. The current study findings match well with this investigation as girls' logographic reading levels were higher than those of boys before the implementation. After the implementation, the results also indicated that girls outperformed boys at all levels of logographic reading.

Conversely, the findings of Ahmad, Al-Zboon, and Dababneh (2018) do not align with the results of the current study and those of Cronin et al. (1999). Ahmad et al. (2018) conducted a study with a group of 449 children aged 4-5 years from preschools in three Jordanian cities, aiming to examine if there are differences in recognition of common signs, a type of environmental print, based on gender, age, or residential area. In this context, the children were presented with common signs found in public spaces and asked to identify their meanings. The findings revealed a statistically significant gender difference in recognizing these signs, with boys

recognizing more common signs than girls. The researchers suggested that this discrepancy could be considered reasonable due to the cultural context, where boys in Arab societies are generally more active and have more opportunities to play in public spaces than girls.

In addressing the final research question, this study also examined the influence of children's receptive and expressive skills on colors and shapes, considering gender differences. The findings indicated that both boys and girls showed improvement post-implementation; however, girls consistently outperformed boys in overall shape recognition and naming accuracy.

Millard (2003) highlights the significant impact of gender on children's receptive and expressive skills, which in turn affects emergent literacy skills. It is well-documented that girls begin speaking earlier than boys and exhibit greater sensitivity to embedded words in environmental prints. Both genetic and environmental factors can explain this phenomenon. Genetically, girls' heightened sensitivity is linked to their biological structure. Environmentally, it is attributed to girls' more frequent and communicative interactions with their mothers. In this context, boys are naturally inclined towards more active play, which results in emergent literacy skill differences between genders (Millard, 2003).

The current study's findings align with research (Huttenlocher et al., 1991; McCoach et al., 2006; Şen, Çiçekler, and Yılmaz, 2010; Below et al., 2010) demonstrated that girls had higher receptive skills compared to boys. The use of environmental prints during the implementation phase of the current study notably contributed to enhancing children's receptive and expressive skills. The environmental prints provided a familiar and engaging context, facilitating better recognition and naming of colors and shapes. This aligns with research by Parlakyıldız and Yıldızbaş (2004), which emphasizes the importance of early interactions in the development of emergent literacy skills.

Contrary to the findings of investigations (Tafa, 2009; Kelman, 2007; Harper and Pelletier, 2008; Tepeli and Karadeniz, 2013; Tarkoçin and Tuzcuoğlu, 2014), which

did not find significant gender differences in receptive skills among children with typical development, this study observed a clear gender-based distinction. The discrepancy may be attributed to the current study's focus on environmental print usage, which might have amplified gender differences in emergent literacy skills. In addition, the divergence in results could stem from the studies' varied methodologies and focus areas. While the current study specifically examined the impact of environmental prints, the other studies may have considered broader aspects of receptive and expressive skills without emphasizing environmental print interactions.

In summary, the study's results are consistent with several prior findings that emphasize the influence of gender on language development and early literacy skills. Environmental prints during the implementation phase have proven effective in enhancing children's receptive and expressive skills, particularly among girls. This indicates the importance of incorporating familiar and engaging materials in early childhood education to support language development across different genders.

These findings are noteworthy because they extend the existing knowledge by providing a cultural perspective on the impact of environmental prints in educational settings, specifically examining how these influences differ by gender. The study demonstrates that using environmental prints notably enhances children's receptive and expressive skills, with girls consistently outperforming boys in logographic reading and recognizing colors and shapes. This cultural insight enriches the field by showing how gender differences in emergent literacy skills are influenced by educational practices. The study highlights the importance of incorporating familiar and engaging materials, such as environmental prints, to support receptive and expressive development effectively. By focusing on gender-based differences, the research provides valuable evidence on how educational interventions can be tailored to address these disparities, contributing to a more nuanced understanding of early literacy development.

5.2. Implications for Educational Practices

The current study's findings provide insights into the gender-specific impacts of environmental print (EP) activities on children's emergent literacy skills, specifically,

logographic reading skills and receptive and expressive skills. These results are significant because it is believed that the current literature was extended by highlighting the gender differences in how children interact with EPs. They offer practical implementations for educators and policymakers in early childhood education.

Based on the results mentioned earlier, it can be said that early childhood educators can integrate environment print (EP) activities into daily classroom routines to enhance emergent literacy skills. EPs activities can provide familiar, engaging, and contextually rich materials that can stimulate children's interest. Previous research supports that EPs effectively improve children's logographic reading knowledge and language skills (Neumann et al., 2013; Korat, 2005). For example, Neumann et al. (2013) found that children exposed to EP activities demonstrated crucial improvements in recognizing and interpreting logographic cues, foundational to early reading development. Similarly, Korat (2005) highlighted the role of EP in enhancing children's ability to decode and understand print within their environment, thus bridging the gap between everyday experiences and formal literacy instruction.

The current study revealed increased interest in EPs and a greater recognition of environmental print during free play time, indicating that EPs can enhance children's emergent literacy skills. Specifically, incorporating EP activities led to children displaying an increased desire for early writing, more frequent recognition of EP during free play, and heightened motivation for learning letters and sounds. These findings align with Harste, Burke, and Woodward (1982), who noted that preschool children discover much about print prior to formal literacy instruction, suggesting that early interactions with EP can lay a strong foundation for later literacy skills. Furthermore, integrating EPs into classroom activities can support a print-rich environment that fosters emergent literacy skills across various contexts. For instance, teacher can create literacy-enriched play settings, as described by Neuman and Roskos (1993), where children interact with EPs in meaningful ways, such as identifying and discussing logos, signs, and labels commonly found in their community. Such interactions reinforce children's understanding of print concepts and encourage the development of critical literacy skills, including print awareness,

alphabet knowledge, and vocabulary (Justice and Ezell, 2002). Incorporating EPs into daily classroom routines can be as simple as using familiar product labels and signs during literacy lessons, creating EP-based plays, and encouraging children to bring EP examples from home to discuss and explore in class. By incorporating EPs into the literacy curriculum, educators can provide children with a dynamic environment to connect their everyday experiences with formal learning, thus enhancing their overall literacy development and supporting children's natural curiosity (Aldridge and Rust, 1987; Wepner, 1985).

The conducting of environmental print activities in this study also displays the critical role of contextually rich and engaging materials in supporting children's emergent literacy skills. The findings indicated that girls benefited more from the activities with EP, highlighting the need for gender-sensitive approaches in early childhood education. Tailoring instructional strategies to address these differences could improve learning outcomes for both genders. Future research might examine the underlying mechanisms of these gender differences and the potential of tailored interventions to support both boys and girls in developing strong emergent literacy skills.

The findings of this study emphasize the significance of incorporating a wider variety of color and shape activities in kindergarten classrooms. Although the children in this study demonstrated basic knowledge of fundamental colors and shapes, educators need to extend the scope of these activities to deepen children's understanding and foster more advanced cognitive and language development. Teachers should implement activities beyond simple identification, encouraging children to classify, compare, and creatively explore these concepts. For example, activities such as color blending, shape pattern creation, and investigating more subtle color shades and geometric forms could be beneficial. Expanding the range of color and shape learning opportunities will support the development of receptive and expressive skills, ultimately enhancing children's emergent literacy skills.

Moreover, comprehensive teacher training programs are essential to support early childhood educators in developing emergent literacy skills and knowledge to

effectively use EPs in their teaching practices. Professional development might focus on how to incorporate EPs into literacy activities and how to support gender differences in literacy acquisition. Studies have shown that teacher training is critical in enhancing the efficacy of literacy programs (Justice and Ezell, 2002; Wasik et al., 2006).

The current study demonstrates the importance of integrating environmental print (EP) activities within a play-based learning framework, which can further enhance children's emergent literacy skills. Play-based approaches provide a natural and engaging context for children to explore print-rich environments, fostering curiosity and discovery (Roskos, 2017) By incorporating environmental prints into play, educators can create meaningful and dynamic literacy experiences that align with children's developmental stages and interests. For instance, setting up literacy-enriched play centers where children engage with environmental prints such as sorting product labels, matching logos with objects, or role-playing with signs and labels in pretend play can help reinforce emergent literacy concepts like print awareness and letter recognition. This play-based integration of EPs can allow children to connect their everyday experiences with learning in a hands-on, enjoyable way, which has been shown to enhance motivation and retention. Additionally, girls and boys may engage with environmental prints differently during free play time, and preparing activities to suit these varied interests can support more balanced emergent literacy development across genders.

In the context of the present study, the mothers and the teacher reported that activities with EPs increased children's interest and motivation for learning letters and sounds. They had a greater desire to identify and demonstrate colors and shapes daily. Moreover, these activities motivated children to engage in early writing activities. This indicates that active engagement with EPs at home and in educational settings can enhance children's emergent literacy skills. Therefore, it is essential to encourage parents to participate in their children's literacy development by integrating EP activities into daily routines, thereby supporting the positive outcomes observed in this study. For instance, Neumann, Hood, and Neumann (2009) found that when parents actively reference environmental prints during daily activities,

such as reading product labels, discussing road signs, and identifying logos, children's letter recognition and early writing skills improve. This parental engagement helps children connect the environmental print they see in their everyday environment and the formal literacy concepts they learn in school. Additionally, Chan, Juan, and Foon (2008) demonstrated that children who engaged in EP-related activities with their parents, such as creating shopping lists or labeling items around the house, showed greater advancements in letter writing and print awareness than those who did not participate in such activities. This suggests that everyday interactions with EPs at home can notably contribute to children's emergent literacy skills.

Another example can be drawn from the study by Aldridge and Rust (1987), which revealed that children who were exposed to EP instruction at home, alongside their school activities, exhibited increased proactive behavior in seeking out environmental print in their environment. They saw themselves as readers and writers, which boosted their confidence and engagement in literacy tasks. Thus, incorporating EP activities into home routines can be simple and effective. For example, parents can involve their children in reading labels on food packages, identifying signs while driving, or playing games that match logos with their corresponding items. These activities can make learning fun and help children see the relevance of print in their everyday lives. This situation can foster a positive attitude toward reading and writing before formal reading.

Policymakers might recognize the benefits of environmental prints (EPs) and develop policies that promote their use in early childhood education, especially for children from low socioeconomic backgrounds. This includes funding teacher training programs integrating EPs into literacy curricula and supporting parental involvement initiatives. Research indicates that children from low-income families have less access to print materials, making EPs a valuable resource for enhancing literacy skills in these communities (Neuman and Celano, 2001). Targeted interventions can significantly benefit children's emergent literacy skills, particularly those from disadvantaged backgrounds (Justice and Ezell, 2002; Neuman and Roskos, 1993). Encouraging parental engagement in literacy activities is crucial,

positively impacting children's emergent literacy skills (Neumann, Hood, and Neumann, 2009). Additionally, teacher training is essential for supporting children's emergent literacy outcomes (Wasik, Bond, and Hindman, 2006). By creating policies that support using EPs, policymakers can help ensure that all children, regardless of socioeconomic status, have the tools they need to develop strong emergent literacy skills.

5.3. Recommendations for Further Research Studies

This research has raised many questions that warrant further investigation. Future studies might aim to explore the long-term impacts of EP-based interventions on children's emergent literacy skills, considering various sociocultural contexts. What is now needed is a cross-national study involving diverse cultural settings to compare the effectiveness of EPs in different educational environments. Such studies can help understand how cultural factors influence the use of EPs in emergent literacy. Snow (2017) emphasized exploring literacy concepts in different languages and cultural contexts to gain a broader understanding.

Future research can explore the broader implications of EP activities on children's emergent literacy skills. The current study found that mothers and teacher reported increased interest and motivation in children learning letters and sounds and a greater desire to identify and demonstrate colors and shapes in daily life. According to their pre-post interview findings, these activities also motivated early writing, aligning with findings by Neumann, Hood, and Neumann (2009), who observed improvements in letter recognition and writing skills through EP engagement.

Further studies can investigate the long-term effects and the impact of parental involvement in reinforcing EP activities at home to support diverse learners from different socioeconomic backgrounds (Neuman and Celano, 2001; Justice and Ezell, 2002). Longitudinal studies could provide insights into how early EP experiences influence later reading performance. This aligns with findings by Neumann et al. (2012), which suggest that early EP exposure can have lasting benefits on later literacy skills.

Further investigations are necessary to determine the efficacy of EP activities and their impact on emergent literacy in both boys and girls. The current study claims that remarkable gender differences in children's logographic reading proficiency and receptive and expressive language skills performance, with girls outperforming boys, consistent with the findings of Cronin et al. (1999). However, this contrasts with the results of Ahmad et al. (2018), where boys exhibited superior performance in children's environmental print reading. The limited existing literature on this topic shows the need for expanding research in this field to provide a comprehensive sociocultural perspective. Such investigations can enhance understanding of gender influences on emergent literacy skills through EP activities and guide future studies in designing methodological frameworks. Addressing these gender disparities can result in more tailored and effective emergent literacy programs that cater to the diverse learning needs of all children (Neumann and Neumann, 2010; Vukelich, 1994).

Future research might investigate the combined effects of environmental prints (EPs) and traditional literacy tools, such as storybooks, on emergent literacy skills. Integrating multiple resources could offer a comprehensive approach to early literacy instruction, supporting children's learning through diverse materials. Justice and Ezell (2002) have highlighted the importance of utilizing varied literacy tools to enhance children's emergent literacy development. Prior (2003) similarly emphasized that incorporating EPs alongside traditional literacy activities can bridge the gap between everyday experiences and formal literacy instruction.

According to pre-post interview findings, mothers reported that children's recognition of environmental prints increased, their interest in EPs heightened, their desire to identify and demonstrate colors and shapes, and their motivation increased to learn letters and sounds. This can indicate that EP activities enhance emergent literacy and cognitive skills such as visual memory beyond logographic reading. Future research can explore the mechanisms behind these effects and the combined impact of children and EP interaction.

In the present study, the activities conducted by classroom teachers and families related to colors and shapes were not explicitly examined. Therefore, the findings of

this study should be interpreted with caution, considering the potential influence of these unexamined factors. Future studies might build on this research by adopting a similar design and investigating the impact of these color and shape-related activities. This could provide a more comprehensive understanding of how such activities contribute to children's emergent literacy skills and receptive and expressive skills in early educational settings.

Finally, further research can explore teachers' perceptions regarding using EPs in early childhood education. Understanding their views could help design more effective interventions and serve practical recommendations to support mechanisms for using EPs in educational settings. Further experimental investigations are needed to estimate the cognitive and developmental impacts of EP-based learning activities on young children. This could include exploring how different types of EPs (e.g., product labels and road signs) influence children's cognitive development and emergent literacy skills. By expanding the scope of research in this field, related literature can gain a more comprehensive understanding of the role of environmental prints in early childhood education and develop more effective strategies.

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APPENDICES

A. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

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07 NİSAN 2023

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Prof. Dr. Refika OLGAN

Danışmanlığını yürüttüğünüz Olcay KETENCİ'nin **"48-54 Aylık Çocukların Yazı ve Görsel içeren Çevresel Uyaranlarla Etkileşimi: Logografik Okuma ve Temel Kavram Gelişimi Uygulamaları"** başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek **0201-ODTUİAEK-2023** protokol numarası ile onaylanmıştır

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Ş. Halil TURAN
Başkan

Prof.Dr. İ.Semih AKÇOMAK
Üye

Doç. Dr. Ali Emre Turgut
Üye

Doç.Dr. Şerife SEVİNÇ
Üye

Dr. Öğretim Üyesi Murat Perit ÇAKIR
Üye

Dr. Öğretim Üyesi Süreyya ÖZCAN KABASAKAL
Üye

Dr. Öğretim Üyesi Müge GÜNDÜZ
Üye

B. APPROVAL OF MINISTRY OF NATIONAL EDUCATION

T.C.
ANKARA VALİLİĞİ
Milli Eğitim Müdürlüğü

Sayı : E-14588481-605.99-75784277 08.05.2023
Konu : Araştırma İzni

ORTA DOĞU TEKNİK ÜNİVERSİTESİ REKTÖRLÜĞÜNE
(Öğrenci İşleri Daire Başkanlığı)

İlgi: a) MEB Yenilik ve Eğitim Teknolojileri Genel Müdürlüğünün 2020/2 sayılı Genelgesi.
b) 19.04.2023 tarihli ve 433520 sayılı yazınız.

Üniversiteniz Temel Eğitim Anabilim Dalı Okul Öncesi doktora programı öğrencisi Olcay KETENCİ'nin **"48-54 Aylık Çocukların Yazı ve Görsel İçeren Çevresel Uyaranlarla Etkileşimi: Logografik Okuma ve Temel Kavram Gelişimi Uygulamaları"** adlı konulu çalışması kapsamında İlimiz Altındağ, Sincan, Mamak, Keçiören ilçelerine bağlı okul öncesi kurumlarında uygulama talebi ilgi (a) Genelge çerçevesinde komisyonumuzca incelenmiştir.

Yapılan inceleme sonucunda, söz konusu araştırmanın Müdürlüğümüzde muhafaza edilen ölçme araçlarının; Türkiye Cumhuriyeti Anayasası, Milli Eğitim Temel Kanunu ile Türk Milli Eğitiminin genel amaçlarına uygun olarak, ilgili yasal düzenlemelerde belirtilen ilke, esas ve amaçlara aykırılık teşkil etmeyecek, eğitim-öğretim faaliyetlerini aksatmayacak şekilde okul ve kurum yöneticilerinin sorumluluğunda, gönüllülük esasına göre uygulanması Müdürlüğümüzce uygun görülmüştür.

Bilgilerinizi ve gereğini rica ederim.

Harun FATSA
Vali a.
Milli Eğitim Müdürü

Ek:
Uygulama Araçları

Dağıtım:
Gereği:
Orta Doğu Teknik Üniversitesi

Bilgi:
Altındağ, Mamak, Keçiören, Sincan İlçe MEM

C. CURRICULUM VITAE

Olcay KETENCİ

EDUCATION

Ph.D.: Early Childhood Education, Middle East Technical University, Ankara, Türkiye *(2015-2024)*

M.S.: Early Childhood Education**,** Hacettepe University, Ankara, Türkiye **(***2012-2014)*

B.S.: Early Childhood Education**,** Middle East Technical University (METU), Ankara, Türkiye **(***2005-2011)*

WORK EXPERIENCE

Research Assistant: Middle East Technical University, Early Childhood Education, Ankara, Türkiye (*06/2015-2/2023)*

Research Assistant: Hacettepe University, Early Childhood Education, Ankara, Türkiye (*07/2014-03/2015)*

Research Assistant: Muğla Sıtkı Koçman University, Early Childhood Education, Muğla, Türkiye *(09/2013-06/2014)*

Kindergarten Teacher (Age 3-4 Group): TED College, Eskişehir, Türkiye *(09/2012-06/2013)*

Kindergarten Teacher (Age 5 Group): TED College, Eskişehir, Türkiye *(09/2011 08/2012)*

AWARDS, HONORS

METU Honor List. *Fall 2007-2008, Fall 2008-2009*

Spring 2008- 2009, Spring 2009-2010

CERTIFICATIONS

Creative Drama Instructor/Leadership Program Certifications

Creative Drama Instructor/Leadership Program, Stage 1

Creative Drama Instructor/Leadership Program, Stage 2

Creative Drama Instructor/Leadership Program, Stage 3

Creative Drama Instructor/Leadership Program, Stage 4

Creative Drama Instructor/Leadership Program, Stage 5

Creative Drama Instructor/Leadership Program, Stage 6 (*Rapporteur)*

Creative Drama Instructor/Leadership Program, Stage 7 (*Voluntary Leadership – 18 hours*)

Denver II Developmental Screening Test Certificate
Organized by Hacettepe University and the Developmental Child Neurology Association, 04/*2011-09/2011*

Recognition and Certificates of Appreciation

12-Hour Creative Drama Training for Parents at TED Eskişehir College, *2011-2012*

20-Hour Communication Skills and Creative Drama Training for Contemporary Life Association Youth, *2009–2010*

D. TURKISH SUMMARY / TÜRKÇE ÖZET

1. Giriş

Araştırmacılar arasındaki fikir birliği, erken okuryazarlığın sağlam bir şekilde anlaşılmasının, özellikle ilkokulun ilk yıllarında çocukların gelecekteki okuma ve yazma başarısı için çok önemli bir belirleyici olduğunu öne sürmektedir (NELP, 2008; Spira, Bracken, Fischel, 2005; saracho, 2013). Buna ek olarak, Ulusal Küçük Çocukların Eğitimi Derneği (NAEYC) (2009) gibi profesyonel kuruluşlar, erken okuryazarlık bilgisinin resmi okuma ve yazmayı öğrenmek için önemli öncül becerileri içerdiğini iddia etmektedir. Ayrıca, gelecekteki akademik başarı için de gerekli olup ve olası okuma zorluklarını önlemekte önemli bir rol oynamaktadır. Dolayısıyla, okuma ve yazma becerisi bir kişinin yaşamı boyunca gelişse de erken okuryazarlık gelişimi doğum ile sekiz yaş arası çocuklar için en kritik dönemdir (Saracho, 2017). Sonuç olarak, erken çocukluk döneminde erken okuryazarlık bilgisinin edinimini keşfetmek için çok sayıda araştırma yapılmıştır (Bayetto, 2013; Strickland, 2011; Neumann, Hood ve Ford, 2013; NELP, 2008; NCFL, 2009; Pinto, Bigozzi, Vezzani, Tarchi, 2016). Ancak Snow Burns ve Griffin (1998) çocukların gelecekteki okuma becerilerinde okuma güçlüğüne neden olan üç temel soruna dikkat çekmiştir. Bunlar alfabetik temel bilginin eksikliği, erken okur yazarlık ve yazı farkındalığıdır. Dolayısıyla, Ulusal Erken okuryazarlık Paneli'nin (2006) meta-analizi, alfabe bilgisi ve yazı farkındalığının çocukların resmi okuma başarısını tahmin etmek için en güçlü göstergeler olduğunu ortaya koymuştur. Benzer şekilde, bu meta-analitik incelemede, çocukların basılı materyallere erişimi ile davranışsal, eğitimsel ve psikolojik sonuçlar arasında tutarlı ve güvenilir ilişkilerin varlığı güçlü bir şekilde teyit edilmektedir. Bu meta analitik çalışmada, çocukların basılı materyallere erişiminin, çocukların gelecekteki akademik başarılarını olumlu yönde etkilemede nedensel bir rol oynadığı iddia edilmektedir. Bu etki özellikle okumaya yönelik tutumları, okuma davranışını, erken okuryazarlık becerilerini ve genel okuma performansını şekillendirmede dikkate değerdir (Lindsay, 2010).

Ulusal literatür, basılı materyallere erişim sağlamanın yanı sıra, erken okuryazarlık gelişiminin desteklenmesinde diğer faktörlerin de dikkate alınmasının önemini vurgulamaktadır. Ulusal bağlamda, erken çocukluk eğitimcileri, çocukların erken okuryazarlık gelişimini desteklemek için yeterli niteliklere sahip değildir (Coşkun ve Deniz, 2017; Ergül vd., 2014). Orta-düşük sosyal-ekonomik statüye (SES) sahip çocukların devam ettiği okullarda erken okuryazarlığı geliştirmek için kullanılan erken okuryazarlık materyallerinin azlığından şikâyet edilmektedir (Kerem ve Cömert, 2005). Çevresel uyaranlar ise alternatif olarak, çocukların sosyal çevresini çevreledikleri ve doğal olarak çocukların her gün maruz kaldıkları doğal uyaranlardır ve tüm çocuklar için erken okuryazarlık materyalleri olarak da kullanılabilmektedirler (Neumann ve Celano, 2001; Korat, 2005).

Erken okuryazarlık gelişim süreci becerileri, tutumları ve bilgiyi kapsamaktadır (Clay, 1966; Sulzby ve Teale, 1991; Whitehurst ve Lonigan, 1998). Bu konuda çalışmaları olan araştırmacılar, çocukların ilkokula başlamadan önce kitaplar ve basılar hakkında önemli ölçüde resmi ve gayri resmi bilgiye sahip olabileceğini kabul etmektedir. Bu bilgi birikimi, resmi okuma becerilerinin gelişimine önemli ölçüde katkıda bulunduğu bilinmektedir (Neuman ve Dickinson, 2003). Erken okuryazarlık gelişimi, bir bebek dünyaya gözlerini açtığında başlar ve erken çocukluk dönemi boyunca gelişmeye devam eder. Küçük çocuklar bu yıllarda konuşmaları gözlemleyerek, oyuncak ve yiyeceklerin üzerindeki logoları, yol işaretleri, restoran menüleri ve reklam panoları dahil olmak üzere çevresel uyaranlara maruz kalırlar ve böylelikle karmaşık erken okuryazarlık sistemlerini tanımaya başlarlar (Griffith, Beach, Ruan, Dunn, 2008). Çevresel uyaranlar; işaretler, etiketler, kuponlar, semboller, oyuncak ve yiyecek paketleri, menüler, logolar, broşürler ve reklam panoları gibi çeşitli unsurları kapsamaktadır (Prior, Gerard, 2004; Horner, 2005). Çevresel uyaranlar (Environmental Print- EP); hikâye kitapları ve gazetelerde bulunan standart baskıdan farklı olarak çekiciliği, renkliliği, benzersizliği, işlevselliği ve akılda kalıcılığı ile karakterize edilir. Bu uyaranlar genellikle tek ya da çok kelimeli etiketlerden oluşur ve caddelerde, reklam panolarında, mağazalarda, reklamlarda ve alışveriş merkezlerinde yaygın olarak görülür (Neuman ve Dickinson, 2003).

Neumann, Hood, Ford ve Neumann (2011) çevresel uyaranlar ile gelecekteki erken okuryazarlık öğrenimi arasındaki ilişkiye dair bir model ortaya koymuştur. Bu sürece göre, doğumdan itibaren görsel beceriler gelişmeye başlar. Daha sonra, çocuklar çevrelerinde gömülü çevresel uyaranlarla karşılaşır ve bu sosyokültürel erken okuryazarlık materyallerini ebeveynler, öğretmen, akranlar ve büyük kardeşlerle etkileşimler yoluyla deneyimler. Bu etkileşimler çocukların logografik okuma bilgisini geliştirerek resmi olmayan okuma becerisinin gelişmesine olanak tanır (Mason, 1980; Ehri ve Roberts, 2006). Logografik okuma, alfabetik bir kod çözme stratejisi edinmeden önce renkler, resimler ve bağlamsal ipuçları gibi çevresel yazılı görsellerden yani çevresel uyaranlardan anlam çıkarmayı içerir (Beech, 2005). Ayrıca, Mason (1980) logografik okumanın okuma gelişimi üzerindeki etkisini araştırmış ve çevresel uyaranların kod çözme sistemlerinin öğrenilmesini kolaylaştırdığını ileri sürmüştür. Bu durum, çocuğun logografik bir okuyucu olmasını sağlayarak erken okuryazarlık bilgisinin geliştirilmesinde ilk aşamayı işaret etmektedir.

Bu çerçevede, çevresel uyaranlara maruz kalmanın tek başına harf-ses farkındalığı, kelime bilgisi ve sözlü dil becerileri gibi erken okuryazarlık bilgilerini kazandırmadığı göz önüne alındığında, iskele kurma çok önemli bir bileşen olarak ortaya çıkmaktadır (Neumann ve ark., 2013). Çocuklar, Vygotsky'nin sosyokültürel teorisiyle (Vygotsky, 1978; Raymond, 2000) uyumlu bir kavram olan erken okuryazarlık bilgisi edinimini teşvik etmek için ebeveynleri, öğretmeni ve büyük kardeşleri de içeren yetişkin eğitimi yoluyla uygun rehberliğe ihtiyaç duyarlar. Stratejik bir yöntem olarak iskele kurma, yetişkinlerin çocuklara özel talimatlarla performanslarını artırmaları için destek vermesini içerir. Bu öğretim stratejisi, erken okuryazarlık becerilerini artırmak için ev ortamlarında ebeveynler ve eğitim ortamlarında eğitimciler tarafından yaygın olarak kullanılmaktadır. Sonuç olarak, iskele kurma, çevresel uyaranların kullanıldığı, yapılan çok sayıda etkili çalışmanın araştırma tasarımlarında ayrılmaz bir unsur haline gelmiştir (Neumann, Hood ve Neumann, 2009; Kuby ve Aldridge, 2004; Vera, 2007).

Erken okuryazarlık gelişimini desteklemede, çevresel uyaranların rolü erken çocukluk eğitiminde büyük ilgi görmüştür. Araştırmalar, 48 ila 54 ay arasındaki

dönemin dil becerilerinin gelişimi için kritik bir aşama olduğunu ve çevresel uyaranların da bu bakımdan önemli bir rol oynadığını göstermektedir. Neumann ve arkadaşları (2013), çocukların çevresel uyaranlar ile etkileşimlerinin dikkatlerini yönlendirme becerilerine bağlı olarak değiştiğini tespit etmiş ve bu etkileşimin çocukların yazılı dili öğrenme kapasitelerini artırabileceğini öne sürmüştür. Bu bulgu, çocukların bu dönemde erken okuryazarlık gelişimi için hayati önem taşıyan çevresel uyaranlara odaklanma ve onlardan anlam çıkarma becerilerinin önemini vurgulamaktadır. Benzer şekilde, Weiss ve Hagen (1988), çocukların çevrelerindeki çevresel uyaranları yorumlayarak ve anlam çıkararak erken okuryazarlık becerilerini geliştirdiklerini göstererek, yazılı dilin erken anlaşılmasının önemini vurgulamıştır.
Ayrıca Bigozzi ve diğerleri (2023), sosyokültürel geçmişlerine bağlı olarak beş yaşındaki çocuklar arasında kelime çözümleme stratejilerindeki değişkenliği vurgulamıştır. Bulguları, çocukların kelimeleri görsel olarak tanımaktan daha karmaşık kod çözme stratejileri kullanmaya geçtikleri beş yaş öncesi dönemin erken okuryazarlık gelişimi için önemini vurgulamaktadır. Bu bilgiler ışığında, 48 ila 54 aylık çocuklara odaklanmak, çevresel uyaranların erken okuryazarlık becerileri ve dil gelişimi üzerindeki etkilerini anlamak için bir gerekliliktir.

Literatür, çevresel uyaranların alıcı dil becerileri üzerindeki önemli etkisinin sürekli olarak altını çizmektedir (Kumaş, 2021; Neumann ve ark., 2013; Prior, 2003; Vera, 2011). Çocukların işitsel uyaranları anlamasını sağlayan alıcı dil becerileri, tipik olarak ifade edici dil gelişiminden önce gelişmektedir ve dil kullanımının temelini oluşturmaktadır (Nelson ve ark., 2006; Benedict, 1979). Çevresel uyaranların, alıcı dil becerilerini desteklemedeki rolünü inceleyen çalışmalar, çevresel uyaranların çocukların yazılı dile ilişkin farkındalıklarını artırdığını ve yazı ile etkileşimlerini teşvik ettiğini göstermektedir (Neumann vd., 2012). Bununla birlikte, araştırmaların çoğu, alıcı dil becerilerine odaklanırken, bu kavramın ifade edici dil gelişimi üzerindeki etkisi yeterince araştırılmamıştır. Düşünce ve duyguların ifade edilmesini içeren ifade edici dil becerileri genellikle daha geç gelişir ve alıcı dil becerilerini geciktirebilir (Konrot, 2005). Farver ve arkadaşları (2007) evde yazılı materyallerin bulunmasının ve bunların çocuklar tarafından kullanılmasının alıcı ve ifade edici dil becerilerini önemli ölçüde geliştirdiğini belirtmiştir. Bu anlayıştan yola çıkan bu çalışma, çevresel uyaranların etkinliklerde kullanarak, alıcı ve ifade edici dil gelişimi

üzerindeki etkisini, özellikle renk ve şekil kavramlarını dahil ederek araştırmayı amaçlamaktadır. Bu çalışma, çevresel uyaranların dil gelişiminin her iki boyutuna nasıl katkıda bulunduğunu inceleyerek, mevcut literatürü genişletmeyi ve erken okuryazarlıktaki rolüne ilişkin yeni bilgiler sağlamayı amaçlamaktadır.

Buna ek olarak, araştırmalar sıklıkla kız ve erkek çocuklar arasında erken okuryazarlık becerilerinde kayda değer farklılıklar olduğunu vurgulamaktadır. Örneğin, McTigue ve arkadaşları (2021), kızların erken çocukluk döneminde erkeklere kıyasla dil gelişimi ve erken okuryazarlık becerilerinde genellikle avantajlı olduğunu bulmuşlardır. Bu avantaj, kızların daha geniş bir kelime dağarcığına sahip olmalarına ve küçük yaşlardan itibaren gramer yapılarını daha iyi kavramalarına bağlanmıştır. Buna karşılık, erkek çocuklar fiziksel oyunlara daha fazla katılma eğilimindedir ve bu da onların erken okuryazarlık gelişimini geciktirebilmektedir (Millard, 2003). Çevresel uyaranların erken okuryazarlık becerileri üstündeki bilinen faydalarına rağmen (Neumann ve ark., 2012; Zamal, Mad Sehat ve Shapiee, 2024), çevresel uyaranlar içeren etkinliklerin yürütülmesinin, cinsiyete göre nasıl etkilendiğini araştıran sınırlı sayıda araştırma vardır. Kız ve erkek çocuklar, çevresel uyaranlara farklı tepkiler verebilir, bu durum da dil becerileri üzerindeki etkisinin cinsiyete bağlı olarak değişmesine yol açabildiği görülmektedir. Örneğin, Cronin ve arkadaşları (1999) kızların, çevresel uyaranları tanıma ve öğrenme konusunda erkeklerden daha başarılı olduklarını tespit etmişlerdir; bu da kızların, çevresel uyaranlardan daha erken faydalanabileceğini ve bu deneyimlerin logografik okuma becerilerini geliştirmede önemli bir rol oynayabileceğini düşündürmektedir. Buna karşılık Jamal, Eman ve Kholoud (2016) tarafından Ürdün'de okul öncesi dönem çocuklarla yapılan bir çalışma, erkek çocukların kamusal işaretleri tanımada kızlara kıyasla daha başarılı olduğunu ortaya koymuştur. Araştırmacılar bu farkı kültürel faktörlere bağlayarak, Arap toplumlarında erkek çocukların daha aktif olma ve kamusal alanlarda daha fazla zaman geçirme eğiliminde olduklarını belirtmişlerdir. Bu zıt bulgular, çevresel uyaranların cinsiyet farklılıkları üzerindeki etkisinin kültürel bağlama göre değişebileceğini göstermekte ve bu alanda daha fazla araştırma yapılması gerekliliğini ortaya koymaktadır.

Bu çalışma, birkaç temel faktörün etkisiyle Türkiye'deki erken çocukluk eğitimi için önemli çıkarımlar taşımaktadır. İlk olarak, bu çalışma, çevresel uyaranlar kavramını

Türkiye'deki erken çocukluk eğitimi bağlamına taşıyarak, özellikle düşük-orta sosyal-ekonomik statüye (SES) sahip çocuklar için erken okuryazarlık bilgisine yeni bir bakış açısı getirmektedir. Neumann, Hood ve Neumann (2009) tarafından yapılan araştırma, çevresel uyaranlara maruz kalmanın erken okuryazarlık becerilerinin geliştirilmesinde kritik öneme sahip olduğunu vurgulamaktadır. Bu çalışma, Türkçe konuşan çocuklarda, çevresel uyaran farkındalığının sınırlı bir şekilde araştırıldığını kabul etmekte ve mevcut literatürdeki önemli bir boşluğun altını çizmektedir. Bu araştırma, bu boşluğu doldurmayı hedeflemekte ve Türkiye'deki çocuklar arasında erken okuryazarlık bilgisinin geliştirilmesine yönelik teorik ilerlemelere ve pratik içgörülerle katkıda bulunmayı amaçlamaktadır. Bu araştırmanın tasarımı, erken okuryazarlık araştırmalarının daha geniş bir kültürel perspektiften faydalanabileceği anlayışıyla uyuşmaktadır. Snow'un (2017) da belirttiği gibi, bu kavramların (çevresel uyaranlar) İngilizce dışındaki dillerde ve farklı kültürel bağlamlarda araştırılması, çevresel uyaranların, çocukların erken okuryazarlık becerilerini nasıl etkilediğine dair incelikli bir anlayış sağlamaktadır. Bu çalışma, çocukların, annelerin ve öğretmenin bakış açılarını içeren çok perspektifli bir yaklaşımla, çevresel uyaranların çocukların erken okuryazarlık bilgilerindeki değişiklikleri şekillendirmedeki rolünün dinamiklerini ortaya çıkarmayı amaçlamaktadır. Bu çalışmanın odak noktası, logografik okuma bilgisi, alıcı ve ifade edici dil gibi alanlara uzanmakta ve Türkiye'deki anaokulları için teorik içgörüler ve pratik çıkarımlar sunmayı amaçlamaktadır.

Mevcut çalışma, çocukların logografik okuma bilgi düzeyleri ile alıcı ve ifade edici dil becerilerine ilişkin daha önce yapılan araştırmaların kapsamını ulusal bağlamda genişletmeye çalışmakta ve çocukların çevresel uyaranlara maruz bırakılmasının etkisini incelemek için nitel bir yaklaşım benimsemektedir. Zamal, Mad Sehat ve Shapiee (2024) tarafından yapılanlar da dahil olmak üzere çok sayıda araştırma, çevresel uyaranların, isim tanıma ve diğer erken okuryazarlık becerilerini geliştirme potansiyelini vurgulamıştalardır. Bununla birlikte, çevresel uyaranların kullanıldığı uygulamaları, erken okuryazarlık kazanımlarını iyileştirmede başarı gösterdiği ortaya konulmuştur.

Ulusal bağlamda, Altun ve Sarı'nın (2018) da belirttiği gibi, bu alandaki erken okuryazarlık çalışmalarının çoğu tarama araştırması yaklaşımını benimsemiştir.

Tarama araştırmaları, nüfusun özelliklerini, tutumlarını, davranışlarını ve görüşlerini tanımlama amacına hizmet etse de (Creswell, 2012), doğası gereği çözüm odaklı uygulamalar sunmaktan ziyade eğilimleri vurgulamaya meyillidir. Araştırma ve pratik uygulama arasındaki bu potansiyel boşluğa atıfta bulunan mevcut çalışma, stratejik olarak bir vaka çalışması araştırma tasarımını tercih etmektedir. Bu yaklaşım, yaygın anket araştırma modelinden ayrılmaktadır. Çevresel uyaranların erken okuryazarlık bilgisi, özellikle de logografik okuma bilgisi ile alıcı ve ifade edici dil üzerindeki etkinliğinin incelikli bir şekilde araştırılması için nitel bir mercek sunmaktadır. Yin'in (2009) '*gerçek yaşam bağlamında çağdaş bir olgunun'* araştırılması olarak tanımladığı vaka çalışmasından (Yin, 2009, s.2.) ilham alan bu araştırma tasarımı, çevresel uyaranların erken okuryazarlık bilgisi üzerindeki etkisinin inceliklerini incelemeyi amaçlamaktadır. Bu sayede, teorik bilgiler ile pratik uygulamalar arasındaki uçurumu kapatmayı, eğitimcilere değerli perspektifler sunmayı ve Türkiye'de erken çocukluk eğitiminde çözüm odaklı uygulamalara duyulan ihtiyaca yönelik bilimsel bilgiler ortaya koymayı amaçlamaktadır.

Mevcut çalışma literatürde çevresel uyaranlar ile ilişkilendirilen logografik okuma bilgisini incelemenin ötesinde alıcı ve ifade edici dil bileşenlerini de mercek altına almıştır. Çevresel uyaranların doğası göz önünde bulundurulduğunda, çocukların okuryazarlığa yaratıcı bir şekilde katılmaları için onlara bir fırsat sunmaktadır. Okuryazarlığın metin okumanın ötesine geçtiğini; çevresel uyaranlardaki sembolleri, renkleri ve soyut temsilleri tanımayı, anlamlandırmayı ve yaratmayı içerdiği vurgulanmaktadır (Clement, Kent ve Duursma, 2021). Bu nedenle, Orellana ve Hernandez (1999) eğitimcilere ve ebeveynlere, çevresel uyaranları kullanarak, çocukları yaratıcı etkinliklere dahil etmeleri için bazı önerilerde bulunmaktadır. Bu çalışmada, Orellana ve Hernandez'in (1999) fikirleri temel alınarak, çevresel uyaranların bir öğretim aracı olarak amaçlı bir şekilde eğitime dahil edilmesinin, çocukların alıcı ve ifade edici dil becerilerinde, bu uyaranların içerdiği şekil ve renk kavramlarını kullanarak, herhangi bir gelişim gerçekleşip gerçekleşmeyeceği araştırılmıştır. Bu çalışmada, çevresel uyaranlarda bulunan göz alıcı ve ilgi çekici renk ve şekilleri kullanarak hem alıcı hem de ifade edici dil açısından incelemek, literatürde sıklıkla göz ardı edilen bir bakış açısını ortaya koymaktadır. Bu bakımdan, bu araştırma, çevresel uyaranlardaki özellikle renkler ve şekiller gibi

temel kavram bilgisini de kullanarak, çocukların logografik okuma bilgi düzeyleri ile alıcı ve ifade edici dile ilişkin bulguları açıklamaya odaklanmıştır. Çalışmada ayrıca çocukların uygulama öncesi ve sonrası logografik bilgi düzeyleri 5 farklı seviyede ele alınarak ve alıcı ve ifade edici becerilerin üzerinde durularak, benzerlikler ve farklılıklar ortaya konulacaktır.

Burgin (2009), yaş, cinsiyet ve sosyoekonomik durum gibi çok sayıda faktörün, çocukların çevresel uyaranlarla etkileşimini şekillendirmede önemli bir rol oynadığını ileri sürmektedir. Bu faktörler, yaş, cinsiyet, sosyoekonomik durum ve çocukların çevresel uyaranlarla etkileşime girme ve bunları kullanma biçimleri arasındaki karmaşık ilişkileri inceleyen gelecekteki araştırmalar için bir temel oluşturacağı için önemlidir. Birçok çalışma (örneğin, McTigue vd., 2021; Below vd., 2010; Deasley vd., 2018) tutarlı bir şekilde, kızların erken çocukluktan ergenliğe kadar çeşitli erken okuryazarlık becerilerinde erkeklerden daha iyi performans gösterdiğini ortaya koymaktadır. Below ve arkadaşları (2010), kızların erken okuryazarlık gelişiminin ilk aşamalarında erkeklerden önemli ölçüde daha yüksek puan aldığını, ancak bu farklılıkların beşinci sınıfa kadar azalma eğiliminde olduğunu göstermiştir. McTigue ve arkadaşları (2021) bu durumu Norveçli öğrenciler üzerinde araştırmış ve kızların harf tanıma ve fonemik farkındalık gibi erken okuryazarlık becerilerinde erken bir avantaja sahip olduğunu bulmuşlardır. Ancak, erkeklerin becerileri örgün eğitimle daha hızlı geliştiğinden bu avantaj zamanla azalmıştır. Yapılan çalışmada, erken okuryazarlık becerilerindeki cinsiyet farklılıklarının karmaşıklığını vurgulanmaktadır. Cinsiyet, çocukların erken okuryazarlık etkinliklerine katılımında da önemli bir rol oynamaktadır. Deasley ve arkadaşları (2018), kızların geleneksel hikâye kitaplarıyla daha fazla ilgilendiğini, erkeklerin ise alfabe e-kitapları gibi etkileşimli formatlara daha fazla ilgi gösterdiğini bulmuştur. Bu durum, okuma materyalinin türünün katılım düzeyini ve dolayısıyla kız ve erkek çocuklarda erken okuryazarlık gelişimini etkileyebileceğini göstermektedir.

Ayrıca, kültürel bağlam, erken okuryazarlık becerilerindeki cinsiyet eşitsizliklerini etkileyebileceği göz önünde bulundurulmalıdır. Örneğin, Jamal ve arkadaşları (2016) Ürdünlü erkek çocukların, kamuya açık tabelalardaki çevresel uyaranlarla etkileşime

girmeleri için daha fazla fırsat sağlayan kültürel normlar nedeniyle, erkeklerin çevresel uyaranları, sembolleri, işaretleri tanımada kız çocuklardan daha başarılı performans gösterdiğini ortaya koymuştur. Buna ek olarak, bakıcılarla etkileşimler de dahil olmak üzere çevre, erken okuryazarlık becerilerini şekillendirmede önemli bir kavramdır. Schick ve Melzi (2016), Latin kökenli okul öncesi çocukların evlerinde çevresel uyaranlar ile ilgili uygulamaların önemini vurgulayarak, kızların erken okuryazarlıkla ilgili faaliyetlerde, bakıcılardan daha fazla destek aldığını ve bunun da erken okuryazarlık kazanımlarında gözlemlenen cinsiyet farklılıklarına katkıda bulunabileceğini belirtmiştir.

Ayrıca, okul öncesi ortam ve bilişsel yetenekler cinsiyete göre farklılık gösterebileceğini ortaya koymaktadır. Araştırmalar, kızların okula sözel becerilerde hafif bir avantajla başlayabileceğini ve bunun da onlara erken okuryazarlık gelişiminde avantaj sağladığını iddia etmektedir. (Rinaldi vd., 2021; Locke vd., 2002). Ancak bu avantaj, erkek çocukların erken okuryazarlık gelişimini destekleyen etkili öğretim stratejileriyle azaltılabildiği vurgulanmaktadır (Rinaldi vd., 2021). Sonuç olarak, önceki araştırmalar erken okuryazarlıktaki cinsiyet farklılıklarına ilişkin değerli bilgiler sağlamış olsa da çevresel uyaranların bu süreçteki rolü yeterince araştırılmamıştır. Mevcut çalışma, çevresel uyaranların eğitimsel amaçlı kullanılarak, etkinlikler yürütülmesinin çocukların logografik okuma bilgisi ile alıcı ve ifade edici dil becerilerini cinsiyete göre farklı etkileyip etkilemediğini incelemeyi amaçlamaktadır. Çalışma, bu bakımdan ilgili literatüre katkıda bulunmakta ve erken okuryazarlık gelişiminde cinsiyet ve çevresel uyaranlar arasındaki etkileşime yeni bakış açıları sunmaktadır.

Ele alınan tüm konulara dayanarak, mevcut çalışma, çevresel uyaranları içeren etkinlikler vasıtasıyla, çocukların logografik okuma becerileri ile alıcı ve ifade edici dil becerileri bakımından, ortaya çıkabilecek değişiklikler üzerinde çevresel uyaranların rolünü aydınlatmayı amaçlamıştır. Sonuç olarak, mevcut çalışma yukarıda belirtilen amaçlar göz önünde bulundurularak aşağıdaki araştırma sorularını ele almak üzere gerçekleştirilmiştir: Birincisi, 48 ila 54 aylık okul öncesi çocukların logografik okuma beceri düzeylerini ve temel renk ve şekil kavramları bilgisine yönelik alıcı ve ifade edici dil becerilerini araştırmayı hedeflemiştir. İkincisi ise

uygulama öncesi ve sonrasında çocukların sonuçlarındaki benzerlik ve farklılıkları ortaya koymayı amaçlamıştır.

Mevcut çalışmadaki araştırma soruları şu şekildedir:

1. 48-54 aylık okul öncesi dönem çocuklarının logografik okuma ve renk ve şekil bilgisine yönelik alıcı ve ifade edici becerileri ne düzeydedir?
2. Çevresel uyaranların kullanıldığı etkinlikler, 48-54 aylık okul öncesi dönem çocuklarının logografik okuma ve renk ve şekil bilgisine yönelik alıcı ve ifade edici becerilerine ilişkin sonuçlarını nasıl değiştirmektedir?
   - **2.1.** Çevresel uyaranların kullanıldığı etkinlikler, 48-54 aylık okul öncesi dönem çocukların logografik okuma beceri düzeylerini nasıl değiştirmektedir?
   - **2.2.** Çevresel uyaranların kullanıldığı etkinlikler, 48-54 aylık okul öncesi dönem çocukların renk ve şekil bilgisine yönelik alıcı ve ifade edici becerilerini nasıl değiştirmektedir?
   - **2.3.** Çevresel uyaranların kullanıldığı etkinlikler, 48-54 aylık okul öncesi dönem çocukların, logografik okuma ve renk ve şekil bilgisine yönelik alıcı ve ifade edici becerileri cinsiyetlerine göre nasıl değiştirmektedir?

2. Metodoloji

Bu çalışmada, vaka çalışması metodolojisine dayanan nitel bir araştırma tasarımı kullanılmıştır. Nitel yaklaşım, nicel yöntemlerin tam olarak yakalayamayacağı, okul öncesi dönem çocukların erken okuryazarlık gelişimiyle ilgili karmaşık olguların derinlemesine araştırılmasına olanak sağlamak için seçilmiştir. Nitel araştırma, araştırmacının veri toplamada birincil araç olarak rolünü vurgular ve yalnızca sonuçlardan ziyade katılımcıların deneyimlerini anlama sürecine odaklanır (Creswell, 2014). Çevresel uyaran etkinliklerinin gerçekleştirildiği sınıf ortamı gibi gerçek yaşam bağlamlarında olguların ayrıntılı bir incelemesini sağlama kabiliyeti nedeniyle bir vaka çalışması tasarımı uygun görülmüştür (Yin, 1994). Açıklayıcı vaka çalışması, özellikle bu faaliyetlerin uygulanması ile çocukların erken okuryazarlık çıktılarındaki değişiklikler arasındaki nedensel ilişkilerin anlaşılmasına

yardımcı olmaktadır. Bu yaklaşım aynı zamanda çocukların gelişiminin çeşitli boyutlarının sosyal-kültürel çevreleriyle ilişkili olarak incelendiği bütüncül bir analize olanak tanır ve bu da Cronbach'ın (1975) vaka çalışmalarının benzersizliğine yaptığı vurguyla uyumludur.

Bu çalışma, Ankara'da düşük ile orta sosyal-ekonomik statü ile karakterize edilen bir yerleşim bölgesindeki bir devlet anaokulunda yürütülmüştür. Çalışma, tek bir sınıfa gerçekleştirilmiş olup ve veri toplama süreci, çocukların logografik okuma ve alıcı, ifade edici becerilerini geliştirmek için hazırlanan etkinliklerin uygulanma süresi on hafta sürmüştür. Çalışma için seçilen sınıf 48 ila 54 ay aralığındaki 18 çocuktan oluşmaktadır, çünkü bu yaş aralığı erken okuryazarlık becerilerinin gelişimi için kritik öneme sahip olduğu çalışmalarda desteklenmiştir (Whitehurst and Lonigan, 1998). Çalışmaya, çevresel uyaran etkinliklerine katılan ve cinsiyete göre eşit dağılım gösteren 9 erkek ve 9 kız, toplam 18 çocuk, anneleri ve sınıf öğretmeni katılmıştır. Çocukların anneleri ve sınıf öğretmeni yarı-yapılandırılmış görüşme formu aracılığıyla bilgi kaynağı olarak çalışmaya dahil edilmiş ve çocukların uygulamadan önceki ve sonraki erken okuryazarlık gelişimleri hakkında fikirleri ortaya konulmuştur. Çocukların yaş, cinsiyet, annenin eğitim durumu ve mesleği gibi demografik bilgileri, kişisel bilgi formu aracılığıyla toplanmıştır.

Bu çalışmada araştırma sorularına cevap verebilmek için her bir çocuğun erken okuryazarlık becerilerinin farklı yönlerini yakalamak için özenle seçilmiş yedi veri toplama aracı kullanılmıştır. Bu veri toplama araçları demografik bilgi formu, çevresel uyaran-çocuk etkileşim sıklığı bilgi formu, logografik okuma testi, gözlemler ve hem anneler hem de öğretmenle yapılan yarı yapılandırılmış görüşmeler ve kontrol listeleri yer almaktadır. Her bir veri toplama aracı, araştırma sorularının kapsamlı bir şekilde anlaşılmasına katkıda bulunmak üzere tasarlanmıştır. Çevresel uyaranların-çocuk arasındaki etkileşim sıklığına ilişkin bilgi formu, çocukların günlük yaşamlarında çevresel uyaranlarla etkileşim sıklığını değerlendirmek için geliştirilmiştir. Çocukların restoran isimleri, sokak tabelaları ve ürün etiketleri gibi çevresel uyaran türlerine maruz kalma durumlarının yanı sıra bu uyaranlarla anlamlı bir şekilde ne ölçüde etkileşime girdiklerine dair sorular içermektedir. Form, ayrıca çocukların gazete ve dergi gibi yetişkinlere yönelik

okuma materyalleriyle etkileşim sıklığı ve çevrelerindeki belirli kelimeleri tanıma becerileri hakkında da bilgi toplamaktadır. Bu veriler, çocukların yazı farkındalığı ve çevresel uyaranlara maruz kalma sıklığını ortaya koyduğu için, çalışma grubunun çerçevesini belirtmektedir.

Logografik okuma testinde, çevresel uyaranlar beş farklı şekilde çocuklara sunularak, her bir seviyedeki becerilerini ortaya koymayı amaçlamaktadır. Bu çalışmada çevresel uyaranlar, beş farklı versiyonda temsil edilmiştir. Bunlar şu şekildedir; (Seviye 1) Logonun üstünde olduğu gerçek ürünün gösterilmesi, (Seviye 2) Logonun üstünde olduğu orijinal ürünün fotoğrafının gösterilmesi, (Seviye 3) Logonun orijinal (renkli) versiyonunun gösterilmesi, (Seviye 4) Logonun fotokopi versiyonunun (ek ipuçları olmadan siyah beyaz) gösterilmesi ve (Seviye 5) Logoda yazılı kelimenin sadece basılı halinin gösterilmesidir. Logografik okuma testi uygulanırken ve yanıtlar puanlanırken her bir seviyeye karşılık gelen logo versiyonları sunulmuştur. Çocuklara her madde için "*Bu ne diyor?"* diye sorulmuştur. Puanlama sistemi doğru cevaplar için 2 puan, anlamlı cevaplar için 1 puan (örneğin, *"PINAR"* içecek olarak yorumlamak) ve cevap yokluğu veya yanlış cevaplar için 0 puan verilmiştir. Logografik okuma testine toplam 20 çevresel uyaran ya da logo dahil edilmiştir.

Çalışma kapsamında, uygulama süresince yani 10 hafta boyunca, haftada bir gün, 30 dk boyunca çocuklar serbest oyun zamanlarında gözlemlenmişlerdir. Araştırmacı, yazı ve görsel içeren uyaranların, logografik okuma bilgi seviyelerinde ele alındığı şekliyle çocukların oynayabilecekleri, oyunlar ve materyallerin olduğu bir öğrenme köşesi oluşturmuştur. Bu süreçte gözlem kayıtları tutulmuştur ve bu kayıtlar gözlem rubriği aracılığıyla her çocuk için ayrı ayrı analiz edilmiştir.

Anne ve öğretmen görüşme formundaki sorular, ilgili literatür ve teorik çerçevelere dayanan gerekçelerle desteklenmektedir. Bu formdaki sorular, çocukların okul ortamında (ön-son öğretmen görüşmeleri yardımıyla) ve evde (ön-son anne görüşmeleri yardımıyla) günlük yaşamda çevresel baskılarla etkileşime girip girmediklerini, dolayısıyla renkler ve şekiller açısından mevcut logografik okuma ve alıcı, ifade edici becerilerini araştırmak için tasarlanmıştır. Bu bağlamda, hazırlanan

sorular Vygotsky'nin çocukların kültürel bağlamları içinde sosyal etkileşim yoluyla öğrendiklerini öne süren sosyokültürel teorisiyle uyumludur (Vygotsky, 1978). Anneler ve sınıf öğretmeniyle, çocukların logografik beceri düzeyleri ve çevresel uyaranların farklı bağlamlardaki farklı versiyonlarına verdikleri tepkiler hakkında görüşmeler yapılmıştır.

Bu çalışmada, temel kavram bilgisi kontrol listesi hazırlanarak, veri toplama aracı olarak kullanılmıştır. Uygulama öncesi ve sonrasında, sınıf öğretmeni tarafından her bir çocuk özelinde doldurulan bu kavram bilgisi kontrol listesi, çocukların renk ve şekil gibi temel kavramlara ilişkin alıcı ve ifade edici becerilerindeki durumu ortaya koymayı ve olası farklılıkları ortaya koymayı amaçlamaktadır.

Bu araştırmada, çalışmanın güvenilirliğini sağlamak için inandırıcılık, aktarılabilirlik, güvenilirlik ve teyit edilebilirlik olmak üzere dört strateji kullanılmıştır. Bulguların doğruluk değerini ortaya koymakla ilgili olan inandırıcılık, nicel çalışmalardaki iç geçerlilikle uyumludur. Bulguların başka bağlamlarda ne ölçüde uygulanabileceğinin belirlenmesiyle ilgili olan aktarılabilirlik, nitel araştırmalarda dış geçerliliğe karşılık gelir. Aynı katılımcılar ve bağlamlarda tekrarlandığında bulguların tutarlılığını gösteren güvenilirlik, nicel araştırmalardaki güvenilirliğe benzer. Teyit edilebilirlik, çalışmanın bulgularında tarafsızlığın sağlanmasını içerir (Lincoln ve Guba, 1985). Lincoln ve Guba (1985), güvenilirliği sağlamak için bu stratejiler dahilinde belirli teknikler önermektedir. Bu çalışmada güvenilirliği sağlamak için uzun süreli katılım, ısrarlı gözlem, üçgenleme ve üye kontrolleri kullanılmıştır.

3. Bulgular

Logografik okuma ön test sonuçlarına göre, çocuklar Seviye 1'de yüksek yeterlilik sergilemiş, Seviye 2'de yeterlilikte hafif bir düşüş olmasına rağmen, puanlar genel olarak Seviye 1'de gözlemlenenlere paraleldir. Bununla birlikte, Seviye 3'te kayda değer bir puan düşüşü görülmüş, bu da ürün bağlamının yokluğunun yarattığı zorlukları vurgulamıştır. Renk ipuçlarının kaldırıldığı Seviye 4'te ise, çocukların logografik okumada daha zorlandıkları görülmüştür. Seviye 5 ise, çocuklar için en

zorlayıcı seviye olduğu için hiçbir çocuk bu seviyede puan alamamıştır. Logografik okuma ön ve son test sonuçlarının karşılaştırılmasına göre, tüm seviyelerde çocukların logografik okuma bilgi seviyelerinde kayda değer gelişmeler olduğunu ortaya belirtilmiştir. Seviye 3 ve 4 sırasıyla yükselen başarı oranlarıyla en kayda değer gelişmeleri ortaya koymuştur. Ön testte Seviye 5'te ise önemli zorluklar yaşanmasına rağmen, son testte başarı oranı küçük de olsa bir artış göstermiştir.
Gözlem bulgularına göre, çocukların logografik okuma beceri seviyelerine göre, çocukların hazırlana oyun merkezinde en çok Seviye 1 ve 2' deki düzeyinde logografik okuma becerisi gösterdikleri ortaya çıkmıştır. Seviye 3 tipik olarak haftada iki ila üç kez, Seviye 4 ise haftada bir ya da iki kez gözlemlenmiştir, bu da daha az sayıda çocuğun bu ileri aşamalara ulaştığını göstermektedir. En ileri beceri olan 5. Seviye ise nadiren sergilenmiş ve çoğu hafta hiçbir çocuk tarafından sergilenmemiştir.

Annelerle yapılan ön görüşmelerden elde edilen bulgulara göre, logolu orijinal ürünleri ile tanıma ($N_{M=}9$), logolu orijinal ürünün renkli fotoğrafı ile tanıma ($N_{M=}7$), ürün olmasa bile sadece logoyu tanıma ($N_{M=}4$) ve logoyu siyah-beyaz formlarında tanıma ($N_{M=}2$) olmak üzere dört ana alt tema ortaya çıkmıştır. Bazı anneler çocuklarının orijinal ürün üzerindeki çevresel uyaran logografik okuma seviyesinde, özellikle de Seviye 1'de okuyabildiğini bildirmiştir. Bazı anneler de çocuklarının renkli bir fotoğraftaki logoyu tanıyabildiğini bildirmiştir. Annelerle yapılan ön ve son görüşmelerin karşılaştırılmasından elde edilen bulgulara göre, çevresel uyaranlar, logografik okumadaki tüm beceri seviyelerinde artış göstermiştir. Ayrıca, son görüşmede, ön görüşmeden farklı olarak '*Çocukların Öğrenme Sonuçlarına İlişkin Algılar'* alt teması ortaya çıkmıştır. Bu alt tema, çeşitli logografik okuma seviyelerinde daha fazla çevresel uyaranı tanımayı, çevresel uyaranlara olan ilginin artmasını, çevresel uyaranın sahip olduğu renkler ve şekiller hakkında alıcı ve ifade edici becerileri göstermeyi ve harfleri ve seslerin öğrenme motivasyonunun artırmasını içermektedir.

Sınıf öğretmeniyle yapılan ön görüşmeden elde edilen bulgulara göre, çocukların yarısından fazlası çevresel uyaranları (Seviye 1) ve (Seviye 2) logografik olarak okuyabilmektedir. Ancak, orijinal ürün bağlamı olmadan gösterildiğinde (Seviye 3, 4

ve 5) çocukların logografik okuma yeterliliklerinin azaldığını belirtmiştir. Öğretmen ile yapılan ön görüşmelerde, çocukların genellikle ana renklerle daha başarılı olduklarını ancak bazen ara renklerle problem yaşadıklarını belirtmiştir. Şekiller konusunda ise çocukların karıştırdıkları şekiller olduğunu ortaya koymuştur. Öğretmenle yapılan ön-son görüşmenin karşılaştırılmasından elde edilen bulgulara göre, logografik okuma ve alıcı, ifade edici beceriler açısından, çocuklarda belirgin bir artış gözlemlemiş ve çocukların çevresel uyaranlarla ilişkili renk ve şekil unsurlarıyla aktif olarak ilgilendiğini ve bunları tartıştığını gözlemlemiştir. Son olarak, çocukların öğrenme çıktılarına ilişkin bulgular ortaya çıkmıştır; bunlar arasında erken yazı yazma isteğinin artması, serbest oyun zamanında çevresel uyaranları tanıma ve harfleri ve sesleri öğrenme motivasyonunun artması yer almaktadır.

Öğretmen tarafından, uygulama öncesi ve sonrası her bir çocuk için doldurulan kontrol listesinden elde edilen ön bulgulara göre, çocukların büyük bir kısmı belirli renkler ve şekiller için güçlü alıcı ve ifade edici beceriler gösterirken, daha az sayıda çocuğun bu beceriler bakımından zorluk yaşadıkları rapor edilmiştir. Tüm çocuklar siyah ve pembe renkleri başarıyla tanıyıp adlandırabilmiş, ancak, daha az sayıda çocuk mavi, sarı ve çoğunlukla gri gibi renkleri tanımış ve ifade etmiştir; bu da çocukların bu renkleri alıcı ve ifade edici becerilerindeki bazı değişkenliklerin altını çizmektedir. Şekillerle ilgili olarak, tüm çocuklar kalp ve yıldız gibi tanıdık şekilleri tanıyabilmekte ve isimlendirebilmekte olup, bu alanlarda güçlü bir yeterlilik göstermiştir. Ancak, özellikle, elmas ve oval şekiller çocuklar için en zor şekiller olarak ortaya çıkmış, sadece küçük bir kısmı bu şekilleri doğru bir şekilde tanımlayabilmiş ve adlandırabilmiştir. Hem renkler hem de şekiller için alıcı ve ifade edici becerileri arasındaki karşılaştırma, çocukların alıcı dil becerilerinin genel olarak ifade edici dil becerilerinden daha güçlü olduğunu ortaya koymaktadır. Renkler için, çocuklar güçlü alıcı beceriler sergilerken, özellikle gri olmak üzere bazı renkleri ifade etmekte daha fazla güçlükle karşılaşmışlardır.

Kontrol listesinin son sonuçlarına göre, çocukların renk ve şekil kavramlarına ilişkin alıcı ve ifade edici becerileri karşılaştırıldığında, renkleri tanıma ve isimlendirmede kayda değer bir gelişme olduğu görülmüştür. Başlangıçta tüm çocuklar siyah, pembe

ve kırmızıyı tanırken, test sonrası tanıma mavi ve beyaza kadar uzanmıştır. En kayda değer ilerleme ise gri renkte görülmüş ve çocukların bu rengi tanıma ve isimlendirme becerileri önemli ölçüde gelişmiştir. En dikkat çekici gelişmeler oval ve elmas şekillerinin tanınması ve isimlendirilmesinde gözlenmiş, bu şekilleri doğru olarak tanıyan ve isimlendiren çocukların sayısında kayda değer bir artış olmuştur.

Cinsiyete göre logografik okuma becerisi ön-son test sonuçları, erkek ve kız çocukların logografik okuma testlerinin farklı seviyelerindeki ilerlemelerini ortaya koymuş ve her iki grup için de son test başarı oranlarında kayda değer iyileşmeler olduğunu göstermiştir. Genel olarak, bulgular hem erkek hem de kızların önemli ilerleme kaydettiğini, ancak özellikle daha yüksek zorluk seviyelerinde kızların sürekli olarak erkeklerden daha iyi performans gösterdiğini ortaya koymaktadır.
Cinsiyet açısından kontrol listesinin sonuçlarına göre, uygulama sürecinden önce kız çocuklar şekillere yönelik hem alıcı hem de ifade edici dil becerilerinde erkek çocuklara göre daha yüksek yeterlilik göstermiştir. Etkinliklerden sonra, her iki cinsiyet de kayda değer gelişmeler göstermiş, erkek çocuklar elmas ve oval gibi daha önce zorlandıkları şekilleri tanımlama ve isimlendirmede kayda değer ilerleme göstermiştir. Bu ilerlemeye rağmen, kızlar genel şekil tanıma ve isimlendirme doğruluğunda erkeklerden daha iyi performans göstermeye devam etmiştir.

4. Tartışma, Eğitimsel Çıkarımlar ve Gelecek Araştırmalar İçin Öneriler

Logografik okuma testleri ve anneler ile öğretmenle yapılan ön görüşmelerden elde edilen bulgular, çocukların orijinal ürünler ve renkli fotoğraflar gibi daha basit seviyelerde çevresel uyaranları tanıma konusunda daha yüksek yeterlilik gösterdiklerini ortaya koymaktadır. Ancak, daha karmaşık seviyelerde (örneğin, düz metin formatları) görsel ve bağlamsal ipuçları olmadığında bu yeterlilik önemli ölçüde azalmaktadır. Bu gözlemler, özellikle logografik okuma konusunda görsel ipuçlarının önemini vurgulayan mevcut literatürle uyumludur (Ehri, 1995; Frith, 1985). Bulgular ayrıca, çocukların çevresel uyaranları tanımada görsel ve bağlamsal bilgilere büyük ölçüde güvendiğini göstermektedir (Zhao vd., 2014; Masonheimer vd., 1984).

Ayrıca, mevcut çalışma, literatürdeki çalışma sonuçlarıyla uyumlu olarak, çocukların özellikle ana renkleri tanıma konusunda alıcı dil becerilerinin, ifade edici dil becerilerinden daha gelişmiş olduğunu göstermektedir (Benedict, 1979; Tamis LeMonda vd., 2006). Piaget ve Vygotsky'nin teorik çerçeveleri, sıklıkla karşılaşılan uyarıcılar ve sosyal etkileşimlerin bilişsel ve dil gelişiminde kritik roller oynadığını vurgulamaktadır (Piaget, 1962; Vygotsky, 1978). Bu bulgular, Türkiye bağlamındaki sonuçların uluslararası çalışmalarla uyumlu olduğunu göstererek, çevresel uyaranlar kavramının sosyokültürel tutarlılığını ortaya koymaktadır (Snow, 2017).

Sosyokültürel bir bakış açısıyla, çalışma, Vygotsky'nin (1978) (scaffolding) teorisini desteklemektedir. Çevresel uyaranlar, çocukların erken okuryazarlık deneyimlerinde destekleyici bir araç olarak hizmet etmektedir. Çalışma, yetişkinlerin rehberliğinde gerçekleştirilen EP etkinliklerine aktif katılımın, çocukların erken okuryazarlık becerilerini önemli ölçüde artırabileceğini göstermektedir. Bu bulgular, çevresel uyaran müdahalelerinin erken okuryazarlık desteğinde etkinliğini vurgulayan önceki araştırmalarla da uyumludur (Neumann and Roskos, 1993).

Alıcı dil becerileri, özellikle renk tanıma konusunda belirgin şekilde gelişmiştir. Piaget'in teorisi, bu ilerlemeyi çocukların çevresel uyaranlardan elde ettikleri yeni bilgileri sürekli olarak bilişsel çerçevelerine entegre etme süreciyle açıklanabilmektedir (Piaget, 1962). Bu çalışma, anlamlı ve bağlamsal olarak zengin çevresel uyaranlarla etkileşimde bulunmanın bilişsel ve dil gelişimini desteklediğini vurgulamaktadır ve bu bulgular Piaget ve Vygotsky'nin teorileriyle uyumludur.

Bulgular aynı zamanda, çevresel uyaran etkinliklerinin hem alıcı hem de ifade edici beceriler için faydalı olduğunu vurgulayan mevcut literatürle de uyumludur (Kumaş, 2021; Prior, 2003; Vera, 2011). Bu çalışma, erken çocukluk eğitiminde ilgi çekici özelliğe sahip olan çevresel uyaranların, eğitimsel sürece entegrasyonunun dil gelişimini nasıl teşvik ettiğini vurgulayarak mevcut tartışmaya katkıda bulunmaktadır. Mevcut çalışma, kız çocuklarının renkleri ve şekilleri tanıma ve adlandırma konusunda daha fazla ilerleme kaydettiğini göstermektedir. Bu bulgular, kız çocuklarının erken çocukluk döneminde dil ve erken okuryazarlık becerilerini

erkeklerden daha hızlı geliştirdiğini öne süren önceki araştırmalarla uyumludur (Harper and Pelletier, 2008; Huttenlocher vd., 1991).

Bu çalışmada, sosyokültürel faktörlerin, cinsiyetin erken okuryazarlık becerileri üzerindeki etkilerini nasıl şekillendirdiği konusunda mevcut bilgilere önemli katkılarda bulunmaktadır. Diğer kültürel bağlamlarda yapılan çalışmalarda, erkek çocuklarının çevresel uyaran tanıma konusunda kız çocuklarından daha iyi performans gösterdiği bulguları da yer almaktadır. Bu farklılıkların kültürel faktörlerden kaynaklanabileceği öne sürülmektedir (Jamal vd., 2016). Bu çalışma, cinsiyet farklılıklarının erken okuryazarlık gelişiminde nasıl ortaya çıktığına dair önemli içgörüler sunmakta ve bu farklılıkları ele almak için uyarlanmış eğitim müdahalelerine ihtiyaç duyulabileceğini vurgulamaktadır.

Son olarak, bu çalışmanın bulguları, erken çocukluk eğitim uygulamaları için birkaç önemli çıkarım sunmaktadır. Eğitimciler, çevresel uyaran etkinliklerini günlük sınıf rutinlerine entegre edebilirler. Öğretim stratejilerinin cinsiyet farklılıklarına göre uyarlanması hem erkek hem de kız çocuklarının erken okuryazarlık becerilerini geliştirmelerini destekleyebilir. Kız çocuklarının dil gelişimindeki hızlı ilerlemeleri, her iki cinsiyeti de destekleyen farklı yaklaşımların gerekliliğini göstermektedir (Millard, 2013). Eğitimciler, çocuklara bu kavramlarla daha derinlemesine ilgilenmelerini teşvik eden gelişmiş bilişsel ve dilsel etkinlikler sunmalıdır (Berk, 2005). Öğretmenlerin, çevresel uyaran içeren uygulamaları etkili bir şekilde eğitime entegre edebilmeleri için kapsamlı mesleki gelişim programlarına ihtiyaç vardır. Bu eğitimler, özellikle cinsiyet farklılıklarını ele alacak şekilde tasarlanmalıdır (Justice and Ezell, 2002; Wasik vd., 2006). Ailelerin, çocuklarının erken okuryazarlık gelişimine katılımını teşvik etmek, çocukların erken okuryazarlık becerilerini geliştirebilir. Çevresel uyaranlar aracılığı ile evde anlamlı etkileşimler, öğrenme deneyimlerini daha keyifli hale getirebilir ve okuma ve yazmaya olumlu bir tutum geliştirmeyi destekleyebilir.

E. THESIS PERMISSION FORM / TEZ İZİN FORM

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