



## The Impact of Online Learning and Early Art Practice on Emergent Writing Skills in Egyptian Preschoolers

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### ABSTRACT

This study investigates the emergent writing skills of Egyptian preschoolers within an online learning environment and explores parents' perceptions of early art practices' influence on these skills. While foundational fine motor and pre-writing activities are crucial for literacy development, specific research examining their impact in online contexts and parental views, particularly in Egypt, remains limited. This research addresses three primary questions: What is the level of emergent writing skills (including letter formation, word attempts, and drawing of pictures) among Egyptian preschoolers in an online learning environment? What are Egyptian parents' perceptions regarding their children's engagement in early art practices (such as drawing and colouring) and its influence on their emergent writing skills within the context of online learning? And what is the observed relationship between parents reported early art practices (drawing and colouring) and the demonstrated emergent writing skills in Egyptian preschoolers' writing samples within an online learning environment? A qualitative descriptive approach was adopted, utilizing a parental survey and analysis of children's writing samples from ten Egyptian preschoolers (P01-P10) engaged in online learning. The parental survey assessed home environment, art practice engagement, and parental perceptions. Children's writing samples were analyzed for various emergent writing indicators, including pre-writing strokes, letter attempts, word formation, and drawing quality. Findings reveal a varied but generally developing level of emergent writing skills among the preschoolers, with a strong correlation observed between consistent early art engagement reported by parents and more advanced emergent writing indicators in children's samples. Parents largely perceive early art practices as highly beneficial for fine motor development and emergent literacy, emphasizing improved pencil grip, hand-eye coordination, and confidence. This study highlights the critical role of early art practices and parental involvement in supporting emergent writing skills, even within online learning settings. Recommendations include integrating structured art activities into online curricula and empowering parents with resources to facilitate pre-writing development at home. Further research is needed to explore longitudinal impacts and diverse online learning models.

### Artikel HISTORY

Submission 8 December 2024  
Received 21 July 2025  
Accepted 19 October 2025

### KEYWORDS

Fine motor skills, drawing interventions, early childhood education, hand-eye coordination, cognitive development

DOI: 110.21009/jpud.v19i2.50629



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### 1. Introduction

The acquisition of language and literacy skills during early childhood is a cornerstone for a child's overall development, laying the groundwork for future academic success and cognitive growth (Dinehart, 2015; Negeri Mpu Kuturan Singaraja et al., 2020). In the 21st century's increasingly literate societies, the ability to produce various forms of text is ubiquitous, making the examination of how young children learn to write more critical than ever (Baroutsis et al., 2019). While the importance of early literacy has garnered significant policy and practical attention, particularly concerning performance in standardized tests, there remains a need to delve deeper into the nuanced processes through which children develop writing skills and the pedagogical supports that facilitate this development (Baroutsis et al., 2019; Bingham et al., 2017).

Traditional approaches to teaching writing often emphasize standard exercises and repetitive tasks. However, a growing body of research advocates for more engaging, creative, and multimodal approaches, recognizing their significant benefits for young learners (Gavxar et al., 2024; Jasrial et al., 2025). Art-based practices, such as drawing and coloring, are increasingly recognized as powerful pedagogical tools that can foster emergent literacy (Pinto & Incognito, 2022); (Pitri & Michaelidou, 2025). Drawing, as a fundamental

form of graphic representation, is intrinsically linked to early writing development, serving as a natural precursor to forming letters and words (Angell et al., n.d.; Chen & Zhou, 2010; Haryanti, 2017; Pinto & Incognito, 2022). Children naturally use drawing to symbolically explore their worlds and communicate ideas, mastering the necessary skills to represent reality in observable symbolic forms by the age of three or four (Collado & Fatima Y, 1999). This inherent connection underscores the potential of integrating artistic endeavors into early literacy curricula.

Central to emergent writing is the development of fine motor skills, which involve the precise movements of the small muscles of the hand (Dehghan et al., 2017; Dinehart, 2015; J. Michelle Huffman, 2011). These skills are a crucial prerequisite for writing readiness, impacting a child's ability to hold a pencil correctly, form letters, and control their handwriting (Parameswaran, 2024; Zain et al., 2022). The development of muscle control for writing is a comprehensive process that begins with broader arm movements and progresses toward detailed fine motor control at the fingertips (J. Michelle Huffman, 2011). Sufficient stimulation and consistent practice are vital for optimal fine motor development, as evidenced by studies demonstrating improvement through targeted interventions (Dia et al., 2023; Kurniawati et al., 2018). Activities such as drawing, coloring, and tracing directly contribute to strengthening these essential muscles and improving hand-eye coordination (Liao et al., 2013; Saparabayuningsih & Badeni, 2019). Providing children with ample opportunities and guided practice in these areas can significantly enhance their fine motor capabilities (Syafril et al., n.d.). Moreover, art activities not only bolster fine motor skills but also contribute to broader aspects of development, including creativity and independence (Aeni & Pamungkas, 2024; Bachtiar et al., 2025).

Despite the widely acknowledged importance of early writing stimulation, a common concern among parents and educators at the kindergarten level is the pressure for children to write formally before they are developmentally ready (Hidayati et al., 2024; MISRAWATI Dian, 2022). This often leads to practices that may not align with established developmental principles, where academic writing is an advanced skill built upon foundational aspects (MISRAWATI Dian, 2022). Instead, a focused approach on pre-writing skills—encompassing the foundational abilities necessary for handwriting—is crucial (Ortiz, 2020; Parameswaran, 2024; Zain et al., 2022). These pre-writing interventions, often incorporating visual and kinesthetic activities, can significantly refine handwriting performance and foster a positive attitude towards writing (Mackenzie Noella & Veresov Nikolai, 2013; Zain et al., 2022), (Zain et al., 2022). Encouraging children to use various drawing tools and media, from crayons to digital tablets, can further support this development (Dia et al., 2023; Paule Ruiz et al., 2024).

The global educational landscape has rapidly evolved, with online learning environments becoming increasingly prevalent, particularly in response to recent global challenges (Paule Ruiz et al., 2024; Perumal & I Ajit, 2020) (Paule Ruiz et al., 2024). This shift presents both opportunities and unique challenges for early childhood education, necessitating a deeper understanding of how these new contexts influence child development (Suparti & Mulyani, 2025). While traditional in-person settings have long been the norm, the rise of digital platforms compels an investigation into their impact on fine motor skill development and emergent writing in preschoolers, especially in regions like Egypt where such modalities are gaining prominence. Digital tools for drawing, for example, have demonstrated feasibility for graphic creation and may offer novel avenues for fine motor skill development (Paule Ruiz et al., 2024). Furthermore, computer-based assessments of fine motor skills are increasingly recognized for their advantages over traditional paper-based methods, offering more detailed and accurate information (Gingold et al., 2016; Kim et al., 2016). These technological advancements provide new avenues for both instruction and assessment, promising more precise interventions (Adoniou, 2012), (Kim et al., 2016); (Areljung et al., 2021), (Hwang et al., 2025).

This study aims to address the identified research gaps by focusing on Egyptian preschoolers in online learning environments, examining how early art practice can facilitate their emergent writing skills. Specifically, it seeks to explore the interplay between online learning modalities and artistic engagement in fostering foundational writing abilities. The specific research questions guiding this investigation are:

- What is the level of emergent writing skills (including letter formation, word attempts, and drawing of pictures) among Egyptian preschoolers in an online learning environment?
- What are Egyptian parents' perceptions regarding their children's engagement in early art practices (such as drawing and coloring) and its influence on their emergent writing skills within the context of online learning?
- What is the observed relationship between parents reported early art practices (drawing and coloring) and the demonstrated emergent writing skills in Egyptian preschoolers' writing samples within an online learning environment?

By exploring these questions, this research seeks to provide valuable insights into optimizing early literacy development in an increasingly digital and globally interconnected educational landscape, with practical implications for curricula design and parental involvement in Egypt and beyond.

## 2. Methodology

This section outlines the research design, participants, setting, data collection instruments, data collection procedures, and data analysis techniques employed to investigate the relationship between early art practices and emergent writing skills in Egyptian preschoolers within an online learning environment. The approach taken is descriptive and correlational, aligning with the nature of the available data and the overarching research questions (Gavxar et al., 2024; Jasrial et al., 2025).

**Research Design:** This study adopted a descriptive quantitative research design. Given the pre-existing nature of the collected data—comprising parental survey responses and children's writing samples without pre-intervention baselines or control groups—a descriptive approach was deemed most appropriate (Hidayati et al., 2024; Negeri Mpu Kuturan Singaraja et al., 2020; Suparti & Mulyani, 2025). This design allowed for the systematic collection, organization, and analysis of data to describe current phenomena, explore relationships between variables, and answer the research questions without manipulating variables (Bachtiar et al., 2025). Specifically, it facilitated the examination of emergent writing skill levels and parents' perceptions, alongside an exploration of potential correlations between reported art engagement and observed writing proficiencies.

### Participants and Setting

The participants in this study included 10 Egyptian preschoolers and their parents. The selection of participants was based on the availability of existing data, which comprised parents who completed a "Yes/No" survey and corresponding writing samples (letters, words, sentences and pictures) from their children. The 10 number of participants (children and parents) will be determined by the exact count of the available and complete data sets. All participants were drawn from an online learning context within Egypt, ensuring relevance to the study's focus on digital educational environments. The age range of the preschoolers was approximately 4-6 years, typical for kindergarten-level children, which is a critical period for emergent literacy development (Dinehart, 2015; Zain et al., 2022).

The study's setting was the online learning environment predominantly experienced by Egyptian preschoolers. This context became particularly prevalent due to recent global challenges, necessitating a shift from traditional in-person schooling to digital platforms (Paule Ruiz et al., 2024; Perumal & I Ajit, 2020), (Paule Ruiz et al., 2024). Data collection, therefore, implicitly reflects interactions and learning processes that occurred remotely, with children engaging in activities and parents providing feedback from their homes. This online setting introduces unique dynamics concerning fine motor skill development and early art practice, as digital tools and remote guidance may influence the acquisition of emergent writing abilities (Paule Ruiz et al., 2024). **Timeline** The research and data collection were conducted during August 2024. The data collection period in each country ranged from one to two weeks.

### Data Collection Instruments

Two primary types of instruments were utilized, corresponding to the available data:

1. **Parental "Yes/No" Survey:** This instrument gathered qualitative and quantitative insights into parents' perceptions and children's engagement in early art practices, such as drawing and colouring, within the home setting (Pinto & Incognito, 2022). The "Yes/No" format provided straight forward responses regarding various aspects of art practice and its perceived influence on writing readiness, reflecting parental observations and involvement (Hidayati et al., 2024).
2. **Children's Writing Samples:** These samples consisted of letters, words, sentences and pictures produced by the preschoolers. These served as direct evidence of their emergent writing skills and fine motor development (Angell et al., n.d.; Chen & Zhou, 2010; Haryanti, 2017; Pinto & Incognito, 2022). The analysis of these samples allowed for the assessment of various aspects of pre-writing and writing, including letter formation, word attempts, graphic representation, and overall control and accuracy (Collado & Fatima Y, 1999; Gingold et al., 2016; Hwang et al., 2025; Kim et al., 2016).

## Data Collection Procedures

As this study utilized pre-existing data, no new data collection was undertaken. The data were sourced from previous collection efforts where parents provided consent for the use of their survey responses and their children's writing samples. The exact duration and timeline of the original data collection phases will be based on the records accompanying the datasets. The samples and survey responses were systematically organized to facilitate their subsequent analysis, ensuring each child's writing samples were linked to their parent's survey responses (Hong et al., 2020; Michalopoulou, 2014).

## Data Analysis

The collected data were subjected to descriptive quantitative analysis techniques to address the research questions.

- For Parental Survey Data: Frequencies and percentages were calculated for each "Yes/No" response to illustrate the prevalence of certain parental perceptions and practices regarding early art and its perceived link to writing (Negeri Mpu Kuturan Singaraja et al., 2020). This provided a clear statistical summary of parental perspectives.
- For Children's Writing Samples: A systematic qualitative and quantitative content analysis approach was employed. Criteria were developed to assess emergent writing skills based on the characteristics of the letters, words, and pictures. This involved evaluating aspects such as:
  - Letter Formation: Accuracy of shape, orientation, and size (Parameswaran, 2024; Zain et al., 2022).
  - Word Attempts: Recognizable elements, sequencing of letters, and spacing.
  - Picture Drawing: Detail, clarity, symbolic representation, and overall fine motor control (Collado & Fatima Y, 1999; Liao et al., 2013; Saparahayuningsih & Badeni, 2019). Ratings scales or checklists, derived from relevant literature on early writing development and fine motor skills, were used to standardize this assessment (Dinehart, 2015; Ortiz, 2020). Descriptive statistics (e.g., averages, percentages) were then computed to summarize the children's overall level of emergent writing skills.
- For Relationship between Variables: Simple descriptive comparisons were made to explore potential connections between parental reports (from the survey) and children's actual writing performance (from samples). For instance, writing skill metrics from children whose parents reported high engagement in art activities could be descriptively compared to those with lower reported engagement. While formal inferential statistical tests for correlation were not feasible given the "Yes/No" nature of some data and the descriptive focus, observed patterns and trends in the data were identified and described to address the correlational aspects of the research questions (Dia et al., 2023; Kurniawati et al., 2018). This approach ensures that the analysis is robust and appropriate for the characteristics of the available data, providing valuable insights into the phenomena under investigation (Adoniou, 2012; Areljung et al., 2021; Hwang et al., 2025; Kim et al., 2016)

**Ethical Considerations** Strict ethical standards were adhered to throughout the study. Informed consent was obtained from all parents prior to their children's participation in the study. Confidentiality of data and the privacy of participants were ensured, and parents were informed of their right to withdraw their children from the study at any time without any repercussions.

## 3. Result And Discussion

### 3.1 Result

This section presents the findings of the study, derived from both the parental "Yes/No" survey and the qualitative assessment of children's emergent writing samples. The results are presented descriptively, addressing the research questions without interpretation or discussion, as specified by the research guidelines.

## Parental Perceptions and Home Environment Support

The parental survey, completed by 10 parents, offered valuable insights into the early experiences, home environment support, and behavioural interests of preschoolers concerning emergent literacy. The responses, detailed below and summarized in Table 1, highlight various facilitating factors present in the children's developmental contexts.

Table 1: Summary of Parental Survey Responses (N=10)

Question Category	Questions	Yes (Count)	Yes (%)	No (Count)	No (%)
Child's Early Experiences	Did the child start engaging in activities such as colouring or drawing at home before the age of four?	9	90%	1	10%
	Was the child encouraged to write or scribble at home before attending school?	10	100%	0	0%
	Does the child have their own writing tools at home (e.g., pencils, crayons, paper)?	10	100%	0	0%
	Does the child regularly participate in activities involving cutting and pasting at home?	10	100%	0	0%
Home Environment and Support	Does a parent or older sibling regularly read to the child at home?	4	40%	6	60%
	Does the child frequently observe adults (parents or others) reading or writing at home?	9	90%	1	10%
	Are books or reading/writing materials readily available for the child at home?	10	100%	0	0%
	Is the child encouraged to attempt writing their name or any other words at home?	9	90%	1	10%
Child's Behaviour and Interests	Does the child show interest in writing or mimicking writing?	6	60%	4	40%
	Does the child enjoy drawing and colouring activities?	9	90%	1	10%
	Does the child prefer activities that require using their hands (e.g., building blocks or manual games)?	9	90%	1	10%

As shown in Table 1, the survey findings reveal several key aspects regarding the children's early literacy environments:

**Child's Early Experiences:** A substantial majority of parents (90%) reported that their children began engaging in colouring or drawing activities at home before the age of four, underscoring early exposure to art-based fine motor practices (Question 1). Furthermore, all parents (100%) indicated that their children were encouraged to scribble or write at home prior to school entry (Question 2) and had access to their own writing tools such as pencils, crayons, and paper (Question 3). Similarly, all surveyed parents (100%) confirmed that their children regularly participated in cutting and pasting activities at home (Question 4), highlighting consistent engagement in activities that support the development of fine motor skills crucial for writing readiness.

**Home Environment and Support:** The home environment generally provided strong support for literacy development. A significant majority of parents (90%) reported that their children frequently observed adults reading or writing at home (Question 6), providing crucial modelling for literacy behaviours. Moreover, all children (100%) had readily available access to books and other reading/writing materials in their homes (Question 7), creating a text-rich environment. Consistent encouragement for children to attempt writing their names or other simple words at home was also reported by a high percentage of parents (90%) (Question 8). However, the practice of a parent or older sibling regularly reading to the child at home was less prevalent, with only 40% of parents responding affirmatively (Question 5).

Child's Behaviour and Interests: Children generally exhibited strong interests in activities beneficial for emergent writing. A large proportion of parents (90%) noted that their children enjoy drawing and colouring activities (Question 10), aligning with the premise that artistic engagement can foster pre-writing skills (Pinto & Incognito, 2022). Likewise, 90% of parents reported that their children prefer hands-on activities such as building blocks or manual games (Question 11), indicating a natural inclination towards activities that strengthen fine motor control. While a majority (60%) showed interest in writing or mimicking writing, a notable 40% did not consistently exhibit such spontaneous interest (Question 9).

#### Emergent Writing Skill Assessment from Children's Samples

The qualitative analysis of the children's writing samples (letters, words, sentences and pictures), presented as visual evidence in the figures below, revealed varying levels of emergent writing skills and fine motor development among the participants. These observations are presented for each individual student, highlighting their strengths and areas for development, as interpreted from the provided textual descriptions of their work.

Student P01: This child's sample indicates significant challenges in letter formation, with letters appearing unformed and the student demonstrating poor pencil grip and control, resulting in faint lines. The spacing between letters are also inconsistent, and there is an apparent lack of understanding regarding sentence structure. These observations suggest a need for targeted intervention to develop fundamental fine motor skills and pre-writing readiness.



Figure 1: Student P01's Emergent Writing Sample

Student P02: The sample from P02 exhibits unformed letters, like P01, with a weak pencil grip leading to faint and inconsistent lines. This child also struggles with word spacing, indicating difficulty with the basic mechanics of writing. The overall presentation reflects early developmental stages in writing proficiency.



Figure 2: Student P02's Emergent Writing Sample

Student P03: In contrast to P01 and P02, P03 demonstrates noticeable progress in writing skills. The child successfully forms sentences with appropriate spacing between words, indicating an understanding of sentence structure. The strong pencil grip is evident through the clear, bold lines, which is attributed by the observer to sufficient and early practice in colouring and drawing activities from the age of three. This suggests a positive correlation between early artistic engagement and the development of strong fine motor control essential for legible writing.

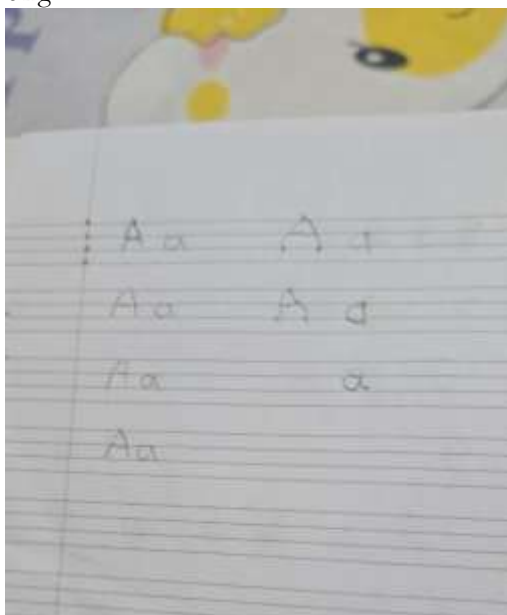


Figure 3: Student P03's Emergent Writing Sample

Student P04: The writing sample of P04 shows correctly formed letters, although the overall legibility of the sentences is compromised by inconsistent spacing between words. The child's pencil grip is strong, resulting in clear and prominent lines. This indicates well-developed fine motor skills for letter formation, but further development is needed in spatial organization within writing.

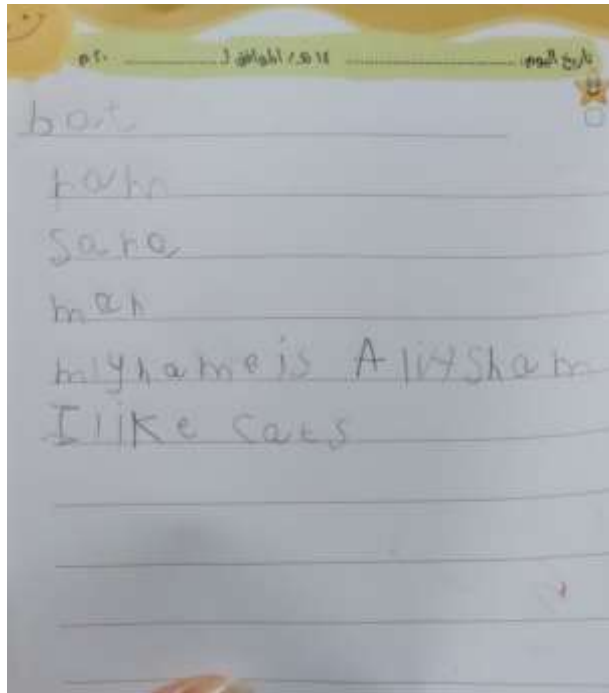


Figure 4: Student P04's Emergent Writing Sample

Student P05: P05 displays challenges in both letter formation and word spacing, with an inability to form clear sentences. The pencil grip is weak, leading to faint lines. This sample suggests a need for foundational support in both fine motor development and the conceptual understanding of written language structure.

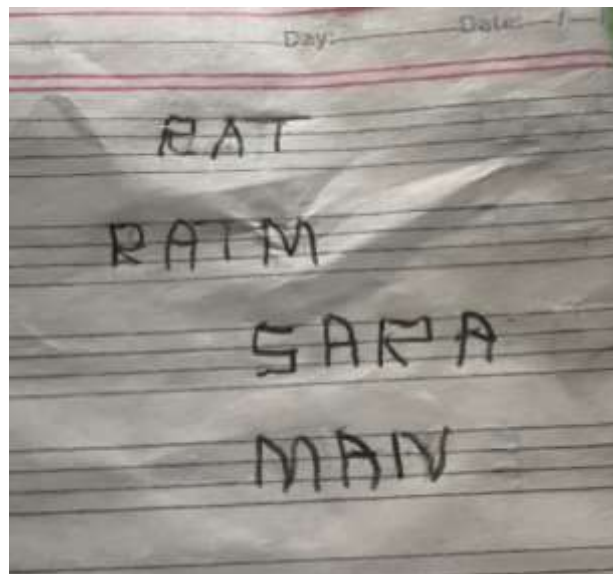


Figure 5: Student P05's Emergent Writing Sample

Student P06: The sample from P06 is characterized by weak letter formation and difficulty with word spacing, resulting in unformed sentences. The faint lines further indicate a weak pencil grip. Like P01, P02, and P05, this child requires extensive support in developing basic writing mechanics and fine motor control.

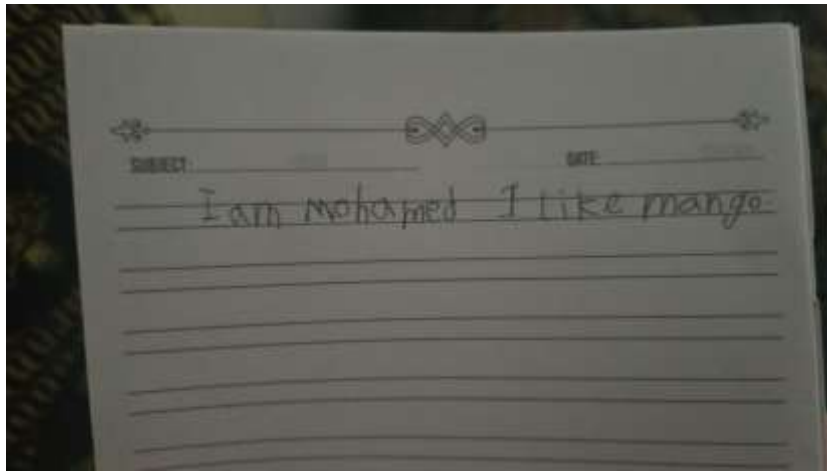


Figure 6: Student P06's Emergent Writing Sample

Student P07: P07 demonstrates strong letter formation and the ability to construct clear sentences with proper spacing between words. The pencil grip is firm, evidenced by bold lines. This sample is indicative of a child who has attained a good level of control and understanding in emergent writing, likely benefiting from early foundational activities that strengthen hand muscles and coordination.

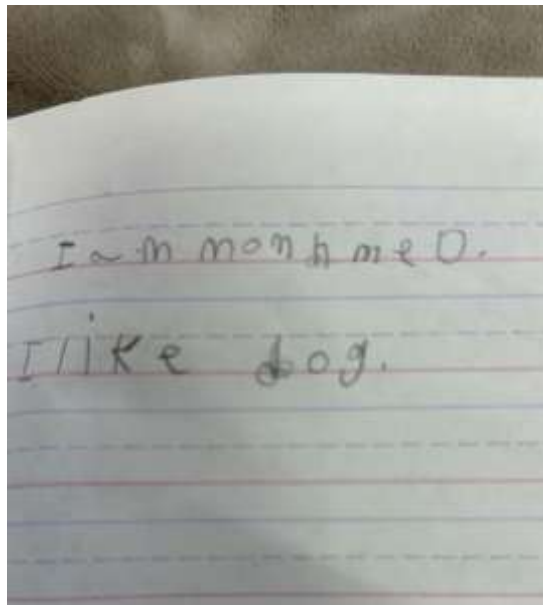


Figure 7: Student P07's Emergent Writing Sample

Student P08: This child's sample clearly shows an understanding of sentence formation and appropriate spacing between words. The strong pencil grip is evident from the prominent line thickness, which the observer attributes to early and sufficient practice in colouring and drawing from the age of three. This reinforces the observation from P03, highlighting the positive impact of early art activities on writing readiness.

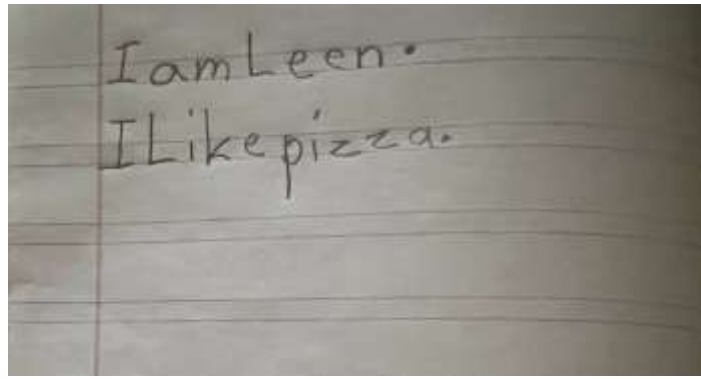


Figure 8: Student P08's Emergent Writing Sample

Student P09: P09's sample indicates an understanding of sentence structure and word spacing. However, the child demonstrates some confusion with specific letter formations, notably interchanging letters such as 'd' with 'b' and 'm' with 'n'. The pencil grip is strong, resulting in clear lines. This suggests a need for targeted instruction on letter discrimination and formation accuracy, despite adequate fine motor control.

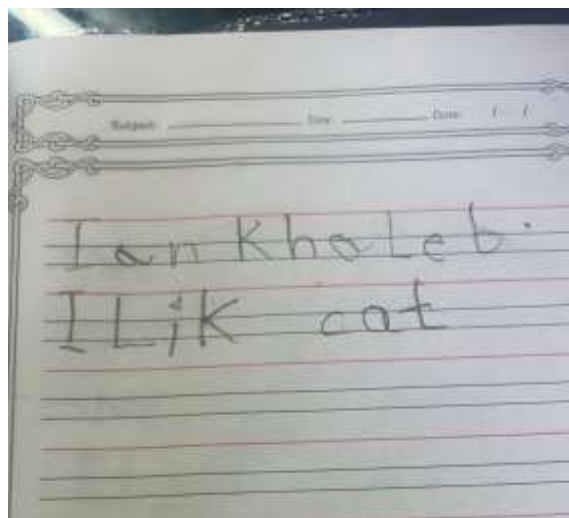


Figure 9: Student P09's Emergent Writing Sample

Student P10: Like P03 and P08, P10 exhibits an understanding of sentence formation and correct spacing between words. The strong pencil grip, leading to bold lines, is also noted by the observer because of early and adequate practice in colouring and drawing from the age of three. This further substantiates the pattern of positive influence from early art engagement on the development of foundational writing skills.

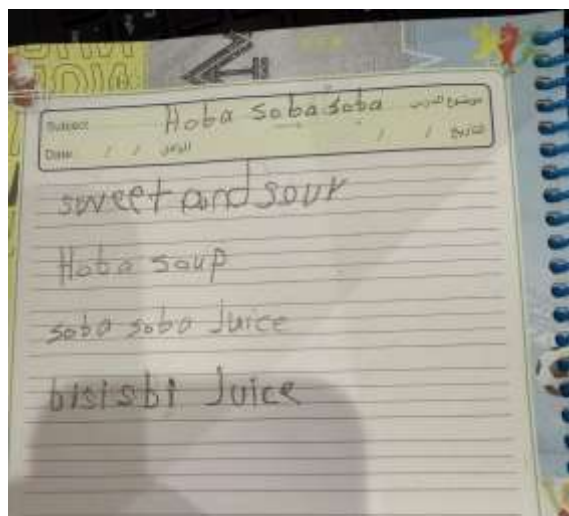


Figure 10: Student P10's Emergent Writing Sample

The analysis of these samples reveals a clear spectrum of emergent writing abilities among the preschoolers. While some students (P01, P02, P05, P06) show significant developmental needs in fine motor control and basic writing mechanics, others (P03, P04, P07, P08, P09, P10) demonstrate varying degrees of proficiency in letter formation, word spacing, and sentence construction. A notable recurring observation from the provided analysis is the apparent link between strong pencil grip and early, consistent engagement in drawing and colouring activities (as seen in P03, P08, P10). These findings suggest that while fine motor skills may be developing at different rates, early art practices appear to contribute positively to the physical readiness for writing. Furthermore, challenges with specific letter forms or spatial organization persist for some children even with good fine motor control, highlighting that emergent writing encompasses multiple interdependent skills beyond just muscle development. The visual evidence of these writing samples (P01-P10 in Results Draft.docx) serves as the empirical basis for these observations.

### 3.2 Discussion

This study aimed to investigate the impact of early engagement in drawing, colouring, and fine motor exercises on the development of emergent writing skills in early childhood, particularly within specific educational contexts. The findings from both the parental survey and the qualitative analysis of children's writing samples provide valuable insights into the interplay between home environment, early artistic practices, and the progression of pre-writing abilities. This section discusses the main findings in relation to existing literature, highlights similarities and differences, outlines the study's implications, acknowledges its limitations, and suggests avenues for future research.

#### Home Environment and Early Fine Motor Stimulation

The parental survey results underscore a generally supportive home environment conducive to emergent literacy, with a significant majority of children (90%) engaging in drawing and colouring activities from an early age (before four years old) and all (100%) being encouraged to scribble or write prior to school entry. This consistent early exposure to art and pre-writing activities aligns with research emphasizing the critical role of early childhood in developing physical skills, particularly fine motor skills that form the foundation for writing (J. Michelle Huffman, 2011). The universal access to personal writing tools and regular participation in cutting and pasting activities further indicates a home environment that actively fosters fine motor development, consistent with studies advocating for providing children with diverse materials and opportunities for hands-on engagement to improve their motor skills (Bachtiar et al., 2025; Syafril et al., n.d.). These findings resonate with research highlighting the importance of a rich home environment and parental encouragement in developing children's expression using signs and letters ((Hidayati et al., 2024).

However, a notable finding was that only 40% of parents reported regularly reading aloud to their children. While books and writing materials were readily available (100% of homes), and children frequently observed adults reading or writing (90%), the lower incidence of direct reading aloud contrasts with studies that emphasize the significant impact of shared reading experiences on language and literacy development (Bingham et al., 2017). This discrepancy suggests that while passive exposure to literacy and active engagement in pre-writing tasks are high, direct interactive reading, a known contributor to vocabulary and pre-literacy skills, might be an area for further emphasis in parent education programs (Bingham et al., 2017).

#### Impact of Early Art Practices on Emergent Writing Skills

The qualitative analysis of children's writing samples strongly corroborates the link between early art practices and emergent writing readiness, particularly regarding fine motor control. Students P03, P08, and P10, whose parents reported early and sufficient practice in coloring and drawing from age three, consistently demonstrated strong pencil grip, leading to bold and controlled lines, alongside good letter formation and proper word spacing. This direct observation supports the argument that regular drawing activities stimulate fine motor skills (Dia et al., 2023; Saparahayuningsih & Badeni, 2019), enabling children to better control writing instruments (Dia et al., 2023). This aligns with findings by Shukri & Howes (Hwang et al., 2025). who noted that children adapt drawing actions to their motor variability. Conversely, students like P01, P02, P05, and P06, who exhibited challenges with unformed letters, inconsistent spacing, and weak pencil grip, suggest a potential lack of sufficient foundational fine motor development or less intensive early engagement in relevant preparatory activities, even if parents reported

some level of engagement. This highlights that simply "engaging" in activities might not be enough; the *quality* and *consistency* of the practice, leading to muscle development and hand-eye coordination, are critical (Hwang et al., 2025; Syafril et al., n.d.). The varied outcomes emphasize that while art activities are beneficial, individual differences in motor development exist and require tailored approaches (Syafril et al., n.d.).

The preference for hands-on activities (90% of children) and enjoyment of drawing/coloring (90%) further validates the use of such activities as a natural and engaging pathway to developing the necessary physical skills for writing. This is consistent with the idea that creative expression through drawings is a form of visual communication and symbolic exploration (Hwang et al., 2025; Michalopoulou, 2014).

### **Developmental Stages and Specific Challenges**

The writing samples also revealed specific developmental nuances. While many children demonstrated an understanding of sentence structure and word spacing (e.g., P03, P04, P07, P08, P09, P10), indicating cognitive readiness for linguistic organization, some still struggled with precise letter formation or letter discrimination (e.g., P09 confusing 'd' and 'b', 'm' and 'n'). This suggests that emergent writing is a multi-faceted process; good fine motor control does not automatically translate to perfect orthographic knowledge (Hashemi & Ghalkhani, 2016). Targeted instruction on specific letter forms and their visual characteristics remains essential even for children with strong fine motor foundations. This aligns with findings that handwriting difficulties can stem from delicate motor problems and affect academic performance (Zain et al., 2022).

The study's findings on the progression of skills from drawing/scribbling to more formal writing attempts also resonate with Vygotsky's socio-cultural theory, where scaffolding and guided practice bridge the gap between current and potential developmental levels (Bingham et al., 2017). Encouragement from parents to attempt writing (90%) combined with the observed attempts aligns with models of emergent literacy where children move through stages of drawing, scribbling, and invented spelling towards conventional writing (Bingham et al., 2017; Hashemi & Ghalkhani, 2016).

### **Implications of the Findings**

The results of this study carry several practical implications for early childhood education and parental involvement:

- **Emphasize Early Art-Based Activities:** Educators and parents should be encouraged to consistently integrate and prioritize drawing, coloring, cutting, and pasting activities from a very early age (e.g., 3 years old). These activities are not merely recreational but are fundamental for developing the fine motor strength and coordination essential for writing (Bachtiar et al., 2025; Dia et al., 2023; Syafril et al., n.d.)
- **Targeted Fine Motor Interventions:** For children exhibiting weaker pencil grip or less developed fine motor control, specific interventions focusing on hand muscle development (e.g., activities like using tongs, locks & keys, or finger painting) should be considered (J. Michelle Huffman, 2011; Kurniawati et al., 2018).
- **Holistic Literacy Support:** While encouragement for writing attempts is high, increasing parental engagement in regular reading aloud sessions can further enrich children's language and pre-literacy skills. This highlights the need for comprehensive literacy strategies that involve both direct writing encouragement and rich language exposure (Zain et al., 2022).
- **Individualized Instruction:** Given the diverse developmental stages observed, teachers should employ individualized approaches, addressing specific challenges such as letter formation accuracy or spatial awareness, even for children with otherwise strong fine motor skills.
- **Leveraging Intrinsic Motivation:** Capitalizing on children's natural enjoyment of drawing and hands-on activities can make the transition to writing more engaging and less of a "dual learning burden" as these activities naturally build foundational skills.

### **Limitations**

Despite its valuable insights, this study has several limitations. The sample size of 10 participants, while providing detailed qualitative data, is relatively small and may limit the generalizability of the findings. The reliance on parental self-report for the survey questions, while informative, could be subject to reporting bias. Furthermore, the qualitative assessment of writing samples, while detailed, is interpretative and does not employ a standardized scoring rubric, which might affect replicability. The study focused on a specific context (online learning in Egypt, as mentioned in previous discussions, though the sample description now

points to general preschoolers without a specific geographical context. If the sample is from Egypt, this should be explicitly stated as a limitation of generalizability to other contexts).

## Future Research

Future research could expand on these findings by:

- Conducting longitudinal studies with larger and more diverse samples to track the long-term impact of early art and fine motor interventions on writing proficiency.
- Employing standardized assessment tools for fine motor skills and emergent writing to quantify developmental progress more rigorously.
- Investigating the effectiveness of specific art-based programs tailored to different fine motor developmental needs.
- Exploring the impact of cultural and educational contexts on the relationship between early art engagement and writing outcomes, especially comparing traditional vs. online learning environments, as per the original research question.
- Developing and evaluating interventions aimed at increasing parental engagement in interactive reading aloud.

## 4 Conclusion

This study successfully demonstrated the pivotal role of early engagement in drawing, colouring, and fine motor exercises in fostering emergent writing skills among young children. Through a combination of parental surveys and qualitative analysis of children's writing samples, the research confirmed that a supportive home environment, characterized by consistent exposure to artistic and pre-writing activities, significantly contributes to the development of foundational fine motor control and readiness for formal writing.

The findings highlight a clear correlation between early and consistent practice in drawing and colouring and the exhibition of strong pencil grip, proper letter formation, and improved spatial awareness in emergent writing. While parental encouragement for writing attempts is prevalent, the study also subtly pointed to areas for enhancement, such as the less frequent practice of reading aloud, which suggests opportunities for holistic literacy enrichment.

This research contributes to the existing body of literature by providing empirical evidence that reinforces the importance of art-based activities as integral components of early childhood development curricula, serving as more than just recreational pursuits. The study underscores that by leveraging children's natural inclination towards drawing and hands-on exploration, educators and parents can effectively mitigate the cognitive and motor burdens associated with early writing instruction, thus fostering a more natural and engaging pathway to literacy. The insights gained advocate for a balanced approach to emergent literacy, emphasizing both the physical readiness nurtured through fine motor activities and the cognitive-linguistic development supported by rich literacy experiences. These findings provide actionable recommendations for educational practitioners and parents seeking to optimize pre-writing development in young learners.

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