



Guided Digital Interaction Digital Parenting Strategy for Early Childhood Cognitive Development among Working Mothers

Pria Dita Anis Wari¹, Dewi Eko Wati^{2*}, Muqowim³, Khamim Zarkasih Putro⁴,
Noviarti⁵, Febriyanti Aulia Maulida⁶, Siska Herna Putri⁷

^{1,3,4,5,6}UIN Sunan Kalijaga, Yogyakarta, Indonesia

²Universitas Ahmad Dahlan, Yogyakarta, Indonesia

⁷Universitas Al Azhar, Cairo, Egypt

*Corresponding Author: Dewi Eko Wati E-mail: dewi.ekowati@pgpau.uad.ac.id

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ABSTRACT

Digital exposure in early childhood has become an increasingly significant factor influencing cognitive development, particularly in attention, memory, and information processing. In this context, parental mediation plays a critical role in shaping how children interact with digital devices. This study aims to explore how Guided Digital Interaction is implemented as a digital parenting strategy by working mothers to support early childhood cognitive development. This qualitative case study involved working mothers from various professional backgrounds, including teachers, midwives, and notary clerks. Data were collected through in-depth interviews and non-participant observations, and analyzed using the Miles and Huberman interactive model. The findings show that effective digital parenting is not determined by the amount of time mothers spend physically with their children, but by the quality of mediated interaction. Five key dimensions of Guided Digital Interaction were identified: proactive technological adaptation, transforming digital media into learning tools through reflective discussion, active co-engagement in digital activities, dialogic communication to encourage reasoning, and consistent environmental regulation. These strategies function as scaffolding that shifts children from passive digital consumption to active cognitive engagement. The study concludes that structured and interactive digital mediation can serve as an effective parenting strategy to support cognitive development and build cognitive resilience in early childhood, particularly among working mothers managing dual roles.

Keywords: *Guided Digital Interaction, Digital Parenting, Working Mothers, Cognitive Development, Scaffolding*

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INTRODUCTION

The rapid expansion of digital technology facilitates daily activities while presenting significant challenges in early childhood upbringing (Yuliana et al., 2022). Data from the Central Statistics Agency indicates that in 2023, 38.92% of young children utilized digital devices, with 32.17% having internet (Silviliyana et al., 2023). However, unmonitored exposure is empirically linked to developmental disorders and impaired brain health,

specifically disrupting cognitive functions such as concentration and memory (Patrama & Nugroho, 2021; Su'adah et al., 2023).

Research in early childhood development consistently demonstrates that excessive and unregulated screen exposure is associated with delays in executive function development, including inhibitory control, working memory, and cognitive flexibility (Anderson & Subrahmanyam, 2017; Linebarger et al., 2014; Wu et al., 2023; Madigan et al., 2019; Lissak, 2018). Studies further indicate that early and prolonged exposure to digital devices is linked to reduced language acquisition and weaker pre-literacy skills, particularly when parental mediation is limited or inconsistent (Kostyrka-Allchorne et al., 2017; Przybylski & Weinstein, 2019; McNeill et al., 2019; Dore et al., 2020). These findings suggest that digital environments can reshape cognitive development trajectories when not properly scaffolded by caregivers. Moreover, neurodevelopmental research highlights that early childhood represents a sensitive period in which environmental stimulation strongly influences synaptic development and attentional regulation (Christakis, 2019; Swing et al., 2010; Radesky & Christakis, 2016). Despite these concerns, digital device use among preschool-aged children continues to increase globally, emphasizing the urgency of effective parental mediation strategies.

Parental mediation has been widely recognized as a critical protective factor in shaping children's digital behavior and cognitive outcomes (Nikken & Schols, 2015; Livingstone et al., 2008; Mascheroni & Ólafsson, 2018; Sanders et al., 2021). Three dominant mediation strategies have been identified in the literature: restrictive mediation, active mediation, and co-use mediation, each contributing differently to children's understanding and regulation of digital content (Nathanson, 2015; Kirwil, 2009; Shin & Li, 2017; Padilla-Walker et al., 2018; Zhao et al., 2021). However, empirical findings suggest that restrictive mediation alone is insufficient to promote cognitive development, as it often limits exploration without fostering critical thinking skills (Lauricella et al., 2015; Coyne et al., 2020). Active mediation, on the other hand, has been shown to enhance children's comprehension, reasoning, and metacognitive awareness when parents engage in dialogic interaction during media use (Nathanson & Beyens, 2018; Valkenburg et al., 2013; Wang et al., 2022). Nevertheless, most studies conceptualize mediation in static categories and do not fully explain how these strategies are dynamically implemented in everyday family routines, particularly among working parents facing time constraints.

A growing body of literature has emphasized the importance of parental involvement in digital environments, yet most studies remain centered on general parenting populations and do not sufficiently address the lived realities of working mothers balancing professional and caregiving responsibilities (Annisa et al., 2024; Widyandari & Maharani, 2021; Pawiloi et al., 2025; McDaniel & Radesky, 2018). Research indicates that working mothers often experience time scarcity, role conflict, and inconsistent supervision patterns, which may reduce the effectiveness of conventional digital parenting strategies (Sandberg et al., 2012; Milkie et al., 2015; Nomaguchi & Milkie, 2020; Radesky et al., 2016). Furthermore, most existing studies rely on quantitative survey designs that fail to capture the nuanced, context-dependent mechanisms through which digital mediation is enacted in daily life (Plowman et al., 2012). This reveals a significant conceptual and methodological gap in understanding how digital parenting operates as a lived practice rather than a theoretical construct. Addressing

this gap, the present study introduces Guided Digital Interaction as a contextual, scaffolded parenting mechanism that integrates technological literacy, dialogic engagement, and environmental consistency to support children's cognitive development in working mother households.

Preliminary observations in the field further underscore these concerns, as several children demonstrated aggressive attitudes and inappropriate behaviors, such as using harsh language toward older family members and hitting parents, primarily by imitating content observed on social media and online games. This suggests that children at this developmental stage tend to passively absorb digital information without sufficient understanding or the cognitive ability to filter content. To mitigate these risks, digital parenting defined as parental support, guidance, and supervision is essential (Mistiani, 2024; Novarossi et al., 2024). Effectively implemented strategies, including content monitoring and educational communication, have been shown to stimulate cognitive development (Dheasari et al., 2022; Yuliana et al., 2022).

A critical gap exists among working mothers who must navigate the dual pressures of professional responsibilities and domestic care (Annisa et al., 2024). Field observations reveal that many parents struggle with consistency or assume child independence, leading to lax monitoring of screen time (Pawiloi et al., 2025; Widyandari & Maharani, 2021). Some parents also lack consistency in establishing device usage rules aligned with guidelines for regulating children's activities (Widyandari & Maharani, 2021). Enhancing digital literacy and establishing consistent routines are vital to ensuring that digital devices serve as educational tools rather than mere distractions (Su'adah et al., 2023).

While previous research has focused on logical thinking, maternal awareness, or descriptive quantitative surveys regarding supervision roles (Maisari & Purnama, 2019; Su'adah et al., 2023; Widyandari & Maharani, 2021), there is a dearth of qualitative exploration into the specific mechanisms of implementation. This study addresses this gap by employing a qualitative case study approach to explore Guided Digital Interaction as a form of scaffolding, in which parental guidance helps children process and interpret digital information (Humaida & Suyadi, 2021). Theoretically, this research enriches the literature on digital parenting for working mothers, practically, it provides a strategic guide for optimizing digital devices to enhance children's cognitive abilities. Therefore, this study aims to explore how Guided Digital Interaction is practiced by working mothers in managing children's digital device use and how these practices contribute to early childhood cognitive development. Specifically, the study seeks to identify the forms of parental mediation used in daily digital interactions, analyze the mechanisms through which guided engagement supports children's cognitive processes, and construct a conceptual understanding of digital parenting as a scaffolded learning environment within the context of working mothers.

RESEARCH METHODOLOGY

Research Design

This study employed a qualitative case study approach. A qualitative design was selected to gain an in-depth and contextual understanding of how working mothers implement digital parenting strategies to minimize the negative impacts of children's digital

device use while supporting cognitive development. This approach enables the researcher to explore participants' lived experiences, particularly in managing dual roles as professionals and caregivers in the digital era.

The case study approach was specifically chosen because this research focuses on a bounded system, namely working mothers at TKIT Ar-Rahman in West Lombok who have young children using digital devices. This approach allows for an in-depth exploration of digital parenting practices within a specific real-life social and educational context, including the interactions, strategies, and challenges experienced by working mothers in everyday parenting situations.

Research Setting and Participants

The research was conducted at TKIT Ar-Rahman in West Lombok, focusing on families with early childhood-aged children (4–6 years old) who are exposed to digital devices. Participants were selected purposively based on criteria aligned with the research objectives. The selected informants consisted of three working mothers from different professional backgrounds, namely a teacher, a midwife, and a notary clerk. The selection criteria included: (1) mothers who actively work outside the home, (2) having children aged 4–6 years, (3) children who use digital devices for at least two hours per day, and (4) willingness to participate voluntarily in the study.

This purposive selection ensured that participants had direct experience in managing children's digital device use and implementing digital parenting practices within the context of dual roles. The participants' different professional backgrounds also provided contextual diversity, particularly in terms of work schedules, caregiving patterns, and opportunities for supervising children's digital activities, which may influence the implementation of digital parenting strategies in everyday life.

Data Collection Techniques

Data were collected through semi-structured in-depth interviews and non-participant observations. Interviews were conducted to explore mothers' experiences, challenges, and strategies in implementing digital parenting, particularly in regulating screen time, supervising digital content, and stimulating children's cognitive development. The semi-structured format allowed flexibility, enabling the researcher to explore issues such as parental consistency, digital literacy, and the balance between work responsibilities and parenting roles.

Observations were conducted during children's daily activities to examine how digital devices were used and how mothers supervised or interacted with their children in real situations. This technique enabled the researcher to capture actual parenting practices and children's behavioral responses that may not be fully revealed through interviews. Observational findings complemented the interview data by confirming and enriching participants' explanations through direct observation of parenting interactions in natural settings. The combination of interviews and observations allowed for data triangulation and strengthened the credibility of the findings.

Data Management and Analysis

Data management was conducted systematically to ensure accuracy and organization. Interview data were transcribed verbatim, and observation notes were documented immediately after each session. The data were then organized and categorized based on emerging themes related to digital parenting practices and children's cognitive development. Themes were developed through repeated comparisons between interview and observational data to identify recurring patterns and relationships.

Data analysis followed the interactive model proposed by Miles et al., (2014), which consists of three stages: data reduction, data display, and conclusion drawing/verification. In the data reduction stage, the researcher focused on relevant data concerning digital parenting strategies and their impact on children's cognitive aspects such as attention, memory, and problem-solving. The data were then displayed in thematic forms to identify patterns and relationships. Finally, conclusions were drawn and continuously verified to ensure the consistency and validity of the findings.

Trustworthiness

To ensure the credibility and reliability of the findings, this study employed source triangulation and temporal triangulation. Source triangulation was conducted by comparing data from different participants with diverse professional backgrounds, while temporal triangulation was applied by collecting data at different times to ensure consistency. These triangulation procedures helped the researcher compare recurring patterns across participants and verify the consistency of emerging themes during the analysis process.

In addition, member checking was conducted to confirm the accuracy of participants' responses and the researcher's interpretations. Participants were given opportunities to review and clarify the findings to ensure that the interpretations accurately reflected their experiences. Systematic documentation and careful analysis were also maintained to enhance the trustworthiness of the study. Through these procedures, the study aimed to produce valid and meaningful insights into how working mothers implement digital parenting strategies to support children's cognitive development in the digital era.

RESULTS AND DISCUSSION

Result

An Overview of the Impact of Children's Device Use

Based on in-depth interviews with informants, it was found that before the implementation of digital parenting practices, children tended to directly imitate behaviors and expressions encountered on social media and online games. At this stage, children lacked the ability to differentiate between positive and negative content, resulting in inappropriate behaviors such as the use of harsh language toward family members and physical aggression. One informant stated, *"My child often repeats words from YouTube and sometimes even speaks rudely to me without understanding what it means"* (M1). This reflects limited cognitive filtering and behavioral regulation in early childhood, indicating reliance on external guidance in interpreting digital content (Cognitive immaturity, Imitation behavior).

Excessive use of electronic devices for more than two hours per day without supervision was also found to reduce children's attention span. Informants noted that

children struggled to maintain focus and showed delayed responses when called. As expressed by one participant, *“If he is watching gadgets, even when I call his name, he only responds after a long time”* (M3). This suggests reduced attentional sensitivity and impaired sustained attention (Attention deficit, Digital overstimulation).

Sleep pattern disturbances were another reported impact, where children tended to stay up late and experience irregular sleep cycles. One mother explained, *“Since using the tablet more often, my child sleeps very late and becomes easily tired the next day”* (M2). These conditions negatively affect concentration, learning readiness, and emotional stability (Sleep disruption, Cognitive fatigue).

Long-term effects were also observed in memory retention and early literacy development. Children experienced difficulty remembering previously learned materials, such as Hijayah letters. An informant stated, *“Even though I have taught the letters before, my child quickly forgets them”* (M4). This indicates disruption in information storage and retrieval processes (Memory retention failure, Early literacy decline).

Overall, the findings of this study indicate that excessive and uncontrolled use of digital devices can have negative effects on various aspects of early childhood cognitive development, including attention span, responsiveness, memory, and early literacy skills. The lack of parental guidance in digital media use tends to encourage passive learning patterns, limiting children’s ability to actively process and understand information

The Practice of Digital Parenting by Working Mothers

In response to these challenges, working mothers implemented various strategies of digital parenting aimed at optimizing children’s cognitive development. First, mothers developed digital literacy to understand both the benefits and risks of technology. One participant explained, *“I need to understand what my child is watching so I can guide him properly”* (M1). This reflects proactive adaptation to technology (Parental digital literacy, Adaptive supervision).

Second, devices were used as learning tools through guided interaction. Mothers accompanied children during media use and encouraged post-viewing discussions. As stated by an informant, *“After watching videos, I always ask what they learned from it”* (M2). This transforms passive consumption into cognitive engagement (Guided interaction, Cognitive stimulation).

Third, active parental involvement was observed during children’s digital activities. One mother noted, *“I often sit with my child while he is using the phone and ask him questions about what he sees”* (M3). This functions as cognitive scaffolding (Active mediation, Co-engagement).

Fourth, two-way communication was used in establishing screen-time rules. A participant explained, *“I tell my child why screen time is limited, so he understands it is for his health”* (M4). This supports logical reasoning and self-regulation (Dialogic communication, Reasoning development).

Fifth, environmental cooperation was emphasized to maintain consistency in rules. One informant stated, *“We agreed in the family not to give gadgets freely to the child so rules are consistent”* (M5). This shows shared supervision beyond the mother-child dyad (Environmental consistency, Collective supervision).

Overall, these findings indicate that the practice of digital parenting by working mothers is carried out through a combination of technological understanding, active guidance, effective communication, and consistency in supervision. These efforts contribute to directing device use so that it does not have a negative impact but can instead be utilized to support the cognitive development of young children more optimally.

Discussion

Uncontrolled use of digital devices by young children has significant implications for their behavioral and cognitive development. Children's tendency to imitate behaviors observed in digital media can be understood as a form of observational learning, in which children absorb information without fully developed filtering abilities (Harsela & Qalbi, 2020). This aligns with findings that unsupervised exposure to digital content increases the risk of children internalizing negative behaviors (Clemente-Suárez et al., 2024). Furthermore, such exposure may also influence other aspects, such as consumption patterns through advertisements for unhealthy foods (Priftis & Panagiotakos, 2023), indicating that the impact of digital media is multidimensional. These findings are further supported by research indicating that gadget use without parental filtering can affect children's cognitive abilities, as children tend to absorb information directly without adequate screening (Khamidah & Sholichah, 2022). However, unlike perspectives that primarily view children as passive recipients of digital influence, the findings of this study suggest that children's responses to digital media are strongly shaped by the quality of parental mediation and interaction during device use.

From a cognitive perspective, excessive screen time is closely linked to a decline in children's attention span and concentration. This reinforces previous findings that intensive use of electronic media can impair children's ability to focus their attention and increase the likelihood of hyperactive behavior (Skowronek et al., 2023). This decline in attention quality also has implications for other cognitive aspects, such as difficulty retaining information and low readiness to learn. In fact, in the long term, high screen exposure from an early age has the potential to hinder the development of problem-solving skills, which are an important part of children's executive functions. Additionally, sleep disturbances caused by device use further worsen children's cognitive conditions, given that sleep quality plays a crucial role in memory consolidation and learning readiness (Rocha et al., 2023). Nevertheless, this study found that the negative effects of gadget use were not determined solely by screen duration, but also by the absence of guided interaction and meaningful supervision during children's digital activities.

In this context, the practice of digital parenting by working mothers serves as a relevant strategy for minimizing the negative impacts while maximizing the positive potential of digital technology use. Parents' ability to adapt to technological developments serves as the primary foundation in determining the quality of guidance provided to children. This is supported by research indicating that parental digital literacy plays a crucial role in guiding the educational use of technology (Mulyani et al., 2020; Nurkiyah et al., 2025). Furthermore, an understanding of children's developmental stages enables parents to select appropriate content, ensuring that children's interactions with digital media remain within safe and

developmentally supportive boundaries (Shibgohtullah & Furrrie, 2024). Unlike studies that emphasize restriction and screen-time limitation as the primary forms of digital parenting, this study indicates that adaptive guidance and active mediation are more influential in supporting children's cognitive engagement.

The use of digital devices as learning tools also shows potential in stimulating children's cognitive development, particularly in the areas of memory and comprehension. This is further supported by research indicating that digital learning tools, such as digital pop-ups, are effective as engaging learning tools capable of stimulating cognitive development in young children (Khamidah & Sholichah, 2022). Activities such as discussions following the viewing of digital content can encourage the recall process, which contributes to strengthening memory (Mulyadi et al., 2022). Additionally, the use of educational games can stimulate various cognitive skills, including problem-solving and logical thinking, provided they are used with parental guidance and appropriate time limits (Hasanah & Gudnanto, 2023; Sumarni, 2022). These findings align with Vygotsky's perspective, which emphasizes the importance of social interaction in children's learning processes, where parental guidance serves as scaffolding to help children understand information obtained from the digital environment (Humaida & Suyadi, 2021). At the same time, this study extends the scaffolding concept by showing that cognitive mediation in the digital era occurs not only through direct teaching activities but also through guided interpretation of digital content in everyday interactions.

Active parental involvement in children's digital activities has also been shown to be a key factor in creating meaningful learning experiences. Interactions fostered through dialogue and communication during device use allow children not only to passively receive information but also to process and interpret it more deeply. This is supported by research showing that parental involvement can improve the quality of digital learning and help children explore new insights in a more focused manner (Hertinjung et al., 2021; Shibgohtullah & Furrrie, 2024; Vedeckina & Borgonovi, 2021). Furthermore, this involvement also serves as a control mechanism, given that young children do not yet possess optimal self-regulation skills. These findings challenge perspectives that position parental supervision primarily as monitoring behavior, as this study demonstrates that parental involvement also functions as cognitive mediation that supports children's reasoning and interpretation processes.

On the other hand, the use of two-way communication when establishing rules for device use demonstrates a more constructive approach to raising children's awareness. By involving children in the decision-making process, they not only understand the rules but also develop logical thinking and cause-and-effect reasoning skills. This strategy aligns with the concept of a learning contract, which has proven effective in maintaining focus and reducing distractions during the learning process (Mufrihah, 2017). Rather than relying solely on authority-based restriction, this approach positions children as active participants in the regulation process, thereby encouraging the development of self-regulation and reflective thinking.

However, the effectiveness of digital parenting is not determined solely by the parents' role but also by the consistency of the child's social environment. A lack of support

from the environment can hinder the implementation of established rules (Khairunnisa & Fidesrinur, 2021). Therefore, communication and cooperation between parents and the surrounding environment are necessary to create an ecosystem that consistently supports digital parenting practices (Rawanita & Mardhiah, 2024). Thus, device usage time management becomes a form of control that is not only individual but also collective. This finding suggests that successful digital parenting among working mothers depends not only on individual parenting competence but also on collaborative environmental support that reinforces consistent digital routines.

CONCLUSION

The use of digital devices by young children poses risks to behavioral and cognitive development, particularly regarding attention, concentration, and readiness to learn if not accompanied by adequate supervision. However, the findings of this study indicate that in the context of working mothers, time constraints are not the primary determining factor; rather, it is the quality of adaptive and consistent digital parenting practices. The integration of parental digital literacy, guidance in device use, two-way communication, as well as structured and consistent rules supported by the environment have proven to be key strategies in steering children's digital experiences toward a more educational direction. This study contributes conceptually by positioning Guided Digital Interaction as a form of adaptive digital parenting that emphasizes active mediation, cognitive engagement, and collaborative supervision rather than merely restricting screen time. These findings are significant because they reinforce the existing understanding that parental involvement plays a role in mediating the impact of technology, while also demonstrating that for working mothers, the effectiveness of parenting is more determined by planned strategies than by the intensity of their presence. The findings also imply that early childhood education programs and family education initiatives need to strengthen parental digital literacy and guided digital interaction practices to support children's cognitive development in the digital era. Thus, this study confirms that digital parenting is a relevant and context-specific parenting practice in the digital age, and has tangible implications for helping parents, particularly working mothers, manage their children's device use in a balanced manner to minimize risks and optimize children's cognitive development.

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