

تأثير الوسائط الرقمية للأطفال في العصر الرقمي: الوعي المعرفي والاجتماعي

The impact of digital media on the cognitive and social awareness of children in the digital era

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الملخص:

يهدف هذا المقال إلى استكشاف تأثير الإعلام الرقمي على الوعي المعرفي والاجتماعي لدى الأطفال في العصر الرقمي. مع الانتشار المتزايد للأجهزة الرقمية والمنصات التفاعلية، أصبح الأطفال غارقين في بيئة إعلامية غنية. سيتم تحليل الآثار الإيجابية والسلبية المحتملة لهذا التعرض، مع التركيز على التطور المعرفي مثل مهارات حل المشكلات والانتباه، وكذلك الوعي الاجتماعي الذي يشمل التعاطف والتفاعلات بين الأقران. إلى مراجعة منهجية للأدبيات العلمية المنشورة في قواعد بيانات رصينة، وتهدف إلى تقديم فهم شامل للتحديات والفرص التي يطرحها الإعلام الرقمي على نمو الأطفال. وستقدم التوصيات لمعالجة الاستخدام الآمن والفعال للإعلام الرقمي بما يدعم النمو الصحي للأطفال.

الكلمات المفتاحية:

الإعلام الرقمي، الوعي الإدراكي، الوعي الاجتماعي، الأطفال، العصر الرقمي، النمو

Abstract:

This article explores the impact of digital media on the cognitive and social awareness of children in the digital age. With the increasing proliferation of digital devices and interactive platforms, children are immersed in a rich media environment. The potential positive and negative effects of this exposure will be analyzed, focusing on cognitive development such as problem-solving skills and attention, as well as social awareness encompassing empathy and peer interactions. The study is based on a systematic review of scientific literature published in reputable databases, aiming to provide a comprehensive understanding of the challenges and opportunities posed by digital media on children's development. Recommendations will be provided to address the safe and effective use of digital media to support children's healthy growth.

Keywords:

Digital Media, Cognitive Awareness, Social Awareness, Children, Digital Age, Development.

1- Introduction:

The pervasive integration of digital media into contemporary society has profoundly reshaped the landscape of childhood. Children today are growing up in an increasingly digitized world, where smartphones, tablets, computers, and various online platforms are not merely tools but integral components of their daily lives. This ubiquitous presence of digital media offers unprecedented opportunities for learning, communication, and entertainment. However, it also presents complex challenges regarding its impact on the fundamental aspects of child development, particularly their cognitive and social awareness.

The digital age has ushered in a paradigm shift in how children acquire knowledge, process information, and interact with their peers and the world around them. Early exposure to diverse digital content, from educational apps and interactive games to social media and streaming services, can influence brain development, attention spans, problem-solving skills, and emotional intelligence. While proponents highlight the potential for enhanced cognitive abilities through interactive learning and access to vast information, critics raise concerns about issues such as screen addiction, decreased face-to-face social interaction, and exposure to inappropriate content.

Understanding the multifaceted impact of digital media on children's cognitive and social development is paramount for parents, educators, policymakers, and researchers. This article aims to critically examine the current state of research concerning how digital media influences these crucial developmental domains. By synthesizing findings from reputable scientific sources, we seek to provide a comprehensive overview of the benefits and drawbacks, offering insights into the complex interplay between technology and child development in the 21st century.

The central problem addressed in this article revolves around the increasingly complex and often contradictory findings regarding the influence of digital media on children's cognitive and social awareness. While the digital environment offers rich stimuli and learning opportunities, there is a growing concern about its potential to disrupt traditional developmental pathways. Specifically, how does sustained exposure to digital media affect attention span, memory, critical thinking, problem-solving skills, empathy, prosocial behavior, and real-world social interactions in children?

The pervasive integration of digital media has ushered in a nuanced and intricate relationship with child development, presenting both profound opportunities and

discernible challenges for children's cognitive and social awareness. This section systematically examines these multifarious effects, drawing upon contemporary research to elucidate the multidimensional nature of digital media's influence.

2- Previous Research and Recent Studies (2017-2025):

Prior scholarship offers a varied perspective on this critical issue. On the cognitive front, a segment of the literature indicates that interactive digital media can indeed enhance specific cognitive functions. For instance, empirical evidence suggests that educational games, as explored by Blumberg et al. (2019) in their work *Digital Games as a Context for Children's Cognitive Development: Research Recommendations and Policy Considerations*, contribute to the improvement of problem-solving abilities and logical reasoning. Furthermore, early exposure to programming applications may foster the development of computational thinking skills, a finding supported by Bers (2018) in *Coding and computational thinking in early childhood: The impact of ScratchJr on young children's problem-solving abilities*. Conversely, considerable concerns have emerged regarding potential detrimental impacts, such as the fragmentation of attention, a diminished capacity for deep reading, and the cultivation of superficial information processing, often attributed to the rapid-fire nature inherent in many digital platforms, as discussed by Carr (2011) in *The Shallows: What the Internet Is Doing to Our Brains*. Studies by Ophir et al. (2009), in their paper *Cognitive control in media multitaskers*, for example, underscored the challenges that multitasking with digital media poses to sustained attention.

Regarding social awareness, the extant literature is similarly divergent. Digital platforms, particularly social media, can serve as conduits for connection and community building, especially benefiting children with niche interests or those experiencing geographical isolation, as highlighted by Reich et al. (2013) in *Skills and social identity: Exploring the digital literacy and social impact of YouTube for adolescents*. These platforms can also facilitate identity formation and provide crucial spaces for self-expression. However, a significant body of research concurrently points to potential detriments. Concerns include the displacement of substantive face-to-face interactions, which may lead to underdeveloped social cues and communication skills, a topic explored by Twenge (2017) in *iGen: Why Today's Super-Connected Kids Are Growing Up Less Rebellious, More Tolerant, Less Happy—and Completely Unprepared for Adulthood—and What That Means for the Rest of Us*. The phenomena of cyberbullying and the inherent pressures associated with presenting an idealized self online can adversely affect self-esteem and exacerbate social anxiety, as discussed by Pabian and Vandebosch (2016) in *The role*

of online self-presentation in adolescents' perceived popularity and social anxiety. Moreover, the comparatively limited opportunities for direct empathetic responses within digital interactions, as opposed to real-life encounters, remain a subject of ongoing academic discourse, noted by Choudhury et al. (2017) in *Impact of social media on empathy: A cross-sectional study among undergraduate students in Kolkata.*

Digital media has fundamentally reconfigured the developmental paradigm for children globally, profoundly reshaping the modalities through which learning, social interaction, and cognitive development manifest. Researchers increasingly observe that children's engagement with digital technology exerts influence not only on their academic performance but also on their social awareness, emotional regulation, and interpersonal competencies. Early investigations, exemplified by Anderson and Subrahmanyam (2017) in *Digital Screen Media and Cognitive Development*, revealed that screen media can yield both salutary and deleterious effects, contingent upon children's chronological ages and the intrinsic nature of the content consumed.

As digital devices achieve ubiquitous integration, it becomes imperative to comprehensively understand the myriad influences exerted by interactive, educational, and entertainment media. A primary objective across numerous studies is to ascertain the precise conditions under which digital media may foster cognitive enhancement while simultaneously identifying critical thresholds beyond which detrimental outcomes—such as language delays or attenuated attention spans—become empirically evident. Across both international and Arabic scholarship, there is a consistent emphasis on the intricate interplay among content quality, exposure duration, and the crucial role of parental mediation.

Anderson and Subrahmanyam (2017): Their investigation, *Digital Screen Media and Cognitive Development*, sought to delineate the relationship between digital screen media and children's cognitive development. They particularly emphasized that for infants and toddlers under two years of age, screen exposure largely correlates with adverse outcomes in language acquisition and executive functioning. Their comprehensive reviews indicated that from approximately two years of age, children begin to comprehend child-directed television, with educational programming demonstrably exhibiting positive influences on cognitive development during the preschool years.

James et al. (2017): This research, titled *Digital Life and Youth Well-being, Social Connectedness, Empathy, and Narcissism*, extended the scope of inquiry into the domain of digital life by examining how extensive media use influences youth

well-being, social connectedness, and empathy. Their objective was to elucidate the multifaceted psychological effects of digital media engagement. Utilizing survey-based methodologies and observational studies, they reported that while digital media can establish social support networks and facilitate family connectivity via video chat, its excessive use is concurrently associated with reduced life satisfaction and heightened incidences of depressive and anxiety symptoms.

Barr (2019): In her study *Growing Up in the Digital Age: Early Learning and Family Media Ecology*, Barr reoriented the focus from mere exposure metrics to the broader framework of family media ecology, situating digital media use within the context of parental involvement and joint media engagement. The objective was to evaluate how digital media—and its embeddedness within the family environment—impacts early learning and socio-cognitive outcomes. Methodologically, Barr employed mixed methods, integrating longitudinal observational data with parent-report surveys and direct cognitive assessments. Her study concluded that while direct media exposure offers potential for educational benefits, excessive background media actively interferes with high-quality parent–child interactions, thereby negatively impacting language development and executive functions.

Blumberg et al. (2019): This research, *Digital Games as a Context for Children's Cognitive Development: Research Recommendations and Policy Considerations*, further elaborated on the discussion by analyzing digital games as a specific context for cognitive development. Their work pursued the dual objective of identifying the precise cognitive functions that video games can augment—such as working memory, perceptual skills, and selective attention—while also discerning the potential social and emotional risks associated with violent or unsupervised gaming. The principal findings suggested that interactive digital gaming, particularly when involving parental co-play, can foster improvements in academically relevant skills and executive functions; however, they underscored that these benefits are highly contingent upon content quality and motivational engagement.

Muppalla et al. (2023): This contribution, *Effects of Excessive Screen Time on Child Development: An Updated Review and Strategies for Management*, presented an updated review specifically addressing the ramifications of excessive screen time on child development. Their objective was to quantify the negative cognitive consequences of prolonged digital media exposure, particularly in relation to executive functioning and language development. The methodology encompassed a critical literature review and meta-analytical techniques, with findings indicating a robust association between prolonged screen time and poorer academic performance alongside an increased risk for attentional deficits.

Panjeti-Madan and Ranganathan (2023): They also provided a comprehensive review titled *Impact of Screen Time on Children's Development: Cognitive, Language, Physical, and Social and Emotional Domains*, investigating the impact of screen time across multiple developmental domains in children under eight years old. Their objective was to rigorously assess both the potential educational benefits and the inherent risks associated with excessive digital media exposure. Employing a mixed-method approach that integrated quantitative analyses of experimental studies with qualitative assessments of parental practices, they concluded that educational media can support early literacy and numeracy skills. However, unmoderated exposure—especially to adult-oriented or violent content—can precipitate behavioral problems and language delays.

Clemente-Suárez et al. (2024): Their objective, presented in *Digital Device Usage and Childhood Cognitive Development: Exploring Effects on Cognitive Abilities*, was to provide an extensive narrative synthesis of over 157 peer-reviewed studies evaluating the impact of digital device usage on children's cognitive abilities. Their methodology adhered to stringent inclusion criteria and systematic reviews of findings across prominent databases such as PubMed, Embase, Scopus, and Web of Science. They identified a dual-edged effect of digital media: on one hand, interactive educational applications and games demonstrated the capacity to enhance multitasking skills, problem-solving abilities, and cognitive flexibility; on the other hand, excessive passive consumption of digital media correlated with cognitive overload, diminished attention spans, and poorer language acquisition.

Existing literature frequently contends with methodological challenges, including the precipitous evolution of digital technologies, the inherent difficulty in isolating specific variables, and the complexities associated with assessing long-term impacts on developmental trajectories. This section thus provides a comprehensive overview, setting the stage for the subsequent comparative analysis and proposed future directions.

3- Methodology:

This article adopts a qualitative research approach primarily based on a systematic literature review. Given the broad and evolving nature of digital media's impact on child development, a comprehensive review of existing academic literature is the most suitable method to synthesize diverse findings and identify key themes, challenges, and opportunities. This approach allows for a nuanced understanding of complex interactions rather than focusing solely on quantitative measurements.

4- Conceptual Definitions:

4-1. Digital Media:

Digital media generally refers to any form of content or data encoded in a machine-readable format that can be accessed, created, and disseminated using digital electronic devices. This broad category encompasses a wide range of technologies and content, including but not limited to: internet-based platforms such as websites, social networking sites (e.g., Facebook, Instagram, TikTok), video-sharing platforms (e.g., YouTube), online games, and educational apps. It also includes digital devices like smartphones, tablets, laptops, desktop computers, gaming consoles, and smart televisions. Furthermore, digital content covers videos, images, audio, interactive applications, e-books, and text-based communications (e.g., instant messaging). (Livingstone & Helsper, 2008)

4-2. Children:

For the purpose of this article, the term "children" generally refers to individuals from infancy (0 years) through late adolescence (up to 18 years of age). This broad age range acknowledges that the impact of digital media can vary significantly across different developmental stages. Where relevant, distinctions will be made between early childhood, middle childhood, and adolescence to highlight specific developmental considerations. (Subrahmanyam & Greenfield, 2008)

4-3. Cognitive Awareness:

Cognitive awareness refers to the mental processes involved in acquiring knowledge and understanding. In the context of child development and digital media, it specifically relates to a set of crucial cognitive abilities. This includes attention, which is the ability to focus on specific stimuli and filter out distractions; memory, the capacity to encode, store, and retrieve information; problem-solving, the ability to effectively identify and resolve issues; critical thinking, which involves the objective analysis and evaluation of information to form a judgment; language development, the acquisition and use of linguistic abilities; and executive functions, which are higher-order cognitive processes like planning, self-regulation, and working memory. These components are vital for understanding how digital media influences a child's capacity to process information and reason. (Diamond, 2013)

4-4. Social Awareness:

The concept of social awareness encompasses a child's understanding of social cues, norms, and the ability to interact effectively with others. In relation to digital media, this aspect includes several important dimensions. It involves empathy, the capacity to understand or feel what another person is experiencing from within their frame of reference; social skills, the abilities needed to interact and communicate with others effectively and appropriately; prosocial behavior, voluntary actions intended to benefit another person or society as a whole; relationship building, the formation and maintenance of connections with peers, family, and other social groups; and finally, self-identity and social comparison, which refers to how children perceive themselves in relation to others, particularly in online contexts. This comprehensive understanding of social awareness is essential for evaluating the impact of digital interactions on a child's socio-emotional development. (Eisenberg & Spinrad, 2014)

4-5. Digital Age:

The term "Digital Age" characterizes the current era, marked by the widespread adoption and deep integration of digital technology into daily life. This period has fundamentally transformed how individuals access information, communicate, learn, and entertain themselves. It implies a pervasive environment where digital interactions are increasingly common and influential, reflecting a fundamental shift in social, economic, and cultural structures driven by technological advancements. (Tapscott, 1995)

5 - The Dual Impact of Digital Media:

The widespread rise of digital media has created a complex relationship between technology and child development, offering both powerful opportunities and notable challenges for children's cognitive and social awareness. This section explores these diverse effects based on recent research, highlighting the multidimensional nature of digital media's impact.

5-1. Cognitive Awareness: Between Enhancements and Concerns

Research shows that digital media's impact on children's cognitive development is not one-dimensional—it brings both potential benefits and serious concerns.

Potential Enhancements	Major Concerns
Problem-Solving and Critical Thinking Apps and games promote logic, strategy, and problem-solving with feedback. (<i>Bers, 2018</i>)	Shortened Attention Span & Multitasking Fast, fragmented content reduces focus and memory. (<i>Ophir et al., 2009</i>)
Information Access and Research Skills Internet access encourages independent learning	Cognitive Overload Excessive stimulation overwhelms young

and critical evaluation. <i>(Leu et al., 2011)</i>	brains and hinders effective learning. <i>(Sweller, 1988)</i>
Visual-Spatial Development Games enhance hand-eye coordination and spatial reasoning. <i>(Greenfield et al., 1994)</i>	Memory and Deep Thinking Reliance on digital tools reduces effort to internalize and analyze. <i>(Carr, 2011)</i>
Language and Literacy Skills Digital tools support vocabulary growth and adaptive learning, especially for children with learning difficulties. <i>(Dalton & Smith, 2013)</i>	Reduced Creativity and Imagination Passive content consumption limits independent, imaginative thinking. <i>(Sigman, 2012)</i>

Digital media is not inherently harmful; on the contrary, it holds immense potential to enhance cognitive skills when used thoughtfully and interactively. However, excessive or unguided use can contribute to reduced attention span, diminished creativity, and shallow thinking. The key lies in maintaining a balanced approach—through adult supervision, careful selection of content, and the inclusion of real-world alternatives that enrich the overall cognitive experience.

5-2. Social Awareness: Connection and Disconnection

Digital media’s influence on children’s social development is equally complex. It allows for new types of connection and learning, while also raising concerns about reduced quality of social interaction.

Table: Social impact of digital media on children

Positive Contributions	Challenges to Social Development
Social Connection and Belonging Digital platforms help children—especially the isolated—connect with peers and explore identity. <i>(Reich et al., 2013)</i>	Decline in Face-to-Face Interaction More screen time reduces chances to practice empathy and interpret social cues. <i>(Twenge, 2017)</i>
Prosocial Behavior and Empathy Exposure to diverse perspectives fosters empathy and civic participation. <i>(Livingstone, 2008)</i>	Cyberbullying and Online Risks Digital anonymity enables bullying, causing psychological harm. <i>(Pabian & Vandebosch, 2016)</i>
Learning Social Norms and Communication Online platforms allow children to observe norms and test social	Social Comparison And Mental Health

roles.	Idealized Social Media content can trigger low self-esteem and anxiety. (<i>Vogel et al., 2014</i>)
Parental Mediation and the Digital Divide Parents play a critical role in shaping children's digital experiences (Livingstone & Helsper, 2008). However, many struggle to keep up with rapidly evolving technologies, making it difficult to set effective boundaries, monitor content, and teach essential digital literacy skills.	Empathy Deficits Lack of face-to-face interaction and algorithmic filtering may hinder genuine empathy. (<i>Choudhury et al., 2017</i>)

Digital media offers rich opportunities for social growth, enabling children to form peer connections, develop empathy through global exposure, and explore communication norms in digital spaces. These positive contributions are particularly important for children who feel socially isolated, as online environments can offer a sense of belonging and emotional safety. However, these benefits are tempered by critical challenges. Excessive screen time may reduce face-to-face interactions essential for emotional intelligence. Risks such as cyberbullying, exposure to unrealistic portrayals on social media, and algorithm-driven content bubbles may negatively affect mental health and empathy development. Furthermore, the role of parents is increasingly complex: many are ill-equipped to monitor, guide, or model healthy digital use due to the rapid pace of technological change, creating a digital divide that limits their ability to mediate effectively. Addressing these challenges requires not just technological literacy among youth, but also support and education for parents to bridge the gap and promote balanced digital engagement.

The impact of digital media is not purely positive or negative—it holds vast potential for supporting cognitive growth and social connection, but also poses real risks to attention, memory, creativity, and face-to-face social skills. The challenge is to strike a balance: to harness the benefits of digital media while protecting children from its potential harms, through informed, thoughtful, and collaborative efforts from families, educators, and society at large.

6- Recommendations:

Addressing the multifaceted impact of digital media on children’s cognitive and social awareness requires a concerted effort from parents, educators, policymakers, and technology developers. By working together, these stakeholders can maximize the benefits of digital media while mitigating its associated risks.

Parents and caregivers should begin by establishing balanced, age-appropriate screen-time limits, emphasizing quality over quantity. For instance, the American Academy of Pediatrics recommends no screen time for children under 18–24 months (except video chatting), and limited, high-quality programming-with parental co-viewing-for those aged 18–24 months to five years. As children grow older, caregivers ought to prioritize active, engaging content rather than passive consumption. Beyond setting limits, parents should practice active mediation and co-viewing: watching educational programs together, discussing game strategies, and debriefing online experiences. This engagement not only enriches learning but also fosters critical thinking and strengthens family bonds. Equally important is nurturing digital literacy: teaching children to evaluate information critically, navigate privacy settings, and recognize manipulative content. Encouraging respectful, empathetic online communication helps mirror positive real-world behavior in the digital realm. To support holistic development, parents must also ensure ample time for unstructured play, face-to-face social interactions, reading physical books, outdoor activities, and family time-experiences that digital media cannot fully replicate. Finally, caregivers serve as role models: demonstrating balanced digital habits and prioritizing inperson connections sets a powerful example for children to follow.

Schools play a pivotal role in preparing students to navigate a digital world responsibly. Integrating digital literacy into the curriculum means more than teaching technical skills -it involves lessons on cybersecurity, media evaluation, managing one's digital footprint, and practicing respectful online communication. When used strategically, digital tools can enhance-but not replace- traditional learning. Interactive educational platforms that promote problemsolving, creativity, and collaboration should align with clear pedagogical goals, ensuring technology serves as a catalyst for deeper understanding rather than a distraction. Moreover, schools can extend their influence by supporting parental education: offering workshops and resources to help families stay informed about emerging digital trends, potential risks, and effective strategies for guiding children's media use.

To safeguard children in the digital landscape, both policymakers and technology developers must adopt a childcentric approach. Technology companies should design platforms and content with children's developmental needs in mind, incorporating features that foster healthy habits, protect privacy, limit excessive engagement, and filter out harmful material. Policymakers, meanwhile, must demand greater transparency from tech companies regarding their algorithms, datacollection practices, and contentmoderation policies, and hold platforms accountable for designs that encourage addictive behavior or expose minors to inappropriate content. Finally,

sustained progress relies on funding interdisciplinary research into the longterm effects of digital media on child development, as well as investing in public awareness campaigns that equip parents and children with the knowledge needed to practice safe, balanced, and healthy digital media habits.

7- Conclusion:

The digital age irrevocably shapes the developmental landscape of children, embedding digital media as an omnipresent force. Its impact on cognitive and social awareness is not a simple dichotomy of good or bad, but rather a complex interplay of benefits and challenges. While digital media offers unprecedented opportunities for enhancing problemsolving skills, facilitating information access, and fostering novel forms of connection, it simultaneously poses risks to attention spans, deep cognitive processing, and the nuanced development of inperson social skills and empathy.

The research highlights a critical need for balanced engagement and informed mediation. Children who navigate the digital world with guidance, purpose, and a strong foundation in realworld interactions are better positioned to harness its advantages while mitigating its drawbacks. Future research must continue to explore the longitudinal impacts, the role of individual differences, and the effectiveness of various interventions. Ultimately, fostering healthy cognitive and social development in the digital era requires a collaborative effort from families, schools, and the wider society to cultivate digitally literate, resilient, and welladjusted individuals capable of thriving in an increasingly interconnected world

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