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Screen Time and Media Consumption: The Role of Technology in Childhood Development

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Introduction

For the last century, technology has actively shaped the childhoods of many generations and has become a fundamental aspect of childhood. From the introduction of the radio and television in the 1900s to digital technology and gaming platforms in the 21st century, children have constantly been exposed to various forms of technology that have aided their understanding of the world. Technology use is not inherently harmful, as its establishment and progression have contributed to a comprehensive understanding of childhood. Notably, the introduction of the internet has enabled national and global access to information, allowing individuals to gain valuable knowledge related to children's development from educated professionals. Further, the interconnectedness of social media facilitates the exchange of information worldwide, expanding an individual's perspective and understanding of childhood. However, the rapid advancement of technology from the early modern world to the contemporary digital world has perpetuated issues associated with the overreliance on digital devices. Children's unrestricted access to technology, in conjunction with the intensification of media consumption and screen time, is particularly concerning for children's cognitive development and social interactions. It has raised public health concerns, threatening the healthy and normal development of children.

Early exposure to digital devices like tablets leads to delayed cognitive development and reduced attention spans, as infants and young children passively engage in popular educational children's shows like Cocomelon and Bluey. Further, young adolescents consume media through mainstream social media apps, like Tiktok and Instagram. This results in low self-esteem and negative body image issues, as the content emphasizes unrealistic standards and romanticized lifestyles.

Technology's Effect on Early Childhood Development

Exposure to digital technology in early childhood is increasingly normalized and becoming a core component of childhood. Popular educational television shows, specifically Cocomelon and

Bluey, are concerning for young children's "behavioural, cognitive, and social development" (Madigan et al., 2019, p. 244). Research conducted by Madigan concludes that a correlation exists between two and three-year olds increased exposure to screen time per week and poorer performance on screening tests. (2019, p. 247). Further, parents' use of educational television shows to engage their children can have counterintuitive effects when young children passively consume the content rather than actively engage with it. Without parental supervision and active interaction, there is a decrease in the educational benefits of cognitive and social development.

Additionally, excessive screen time in early childhood has progressively raised public health concerns regarding children's educational capacities and ability to succeed in an academic environment. Increasingly, "preschoolers become familiar with digital devices before they are exposed to books." (Gottschalk, 2019, p. 6). This emerging pattern suggests that digital technology is increasingly becoming the primary means through which young children explore diverse worldviews that encourage imagination and critical thinking beyond traditional boundaries. Despite Pappas's strong research findings that "screens aren't an effective teaching tool for the baby and toddler set" (2022, "babies, toddlers, preschoolers, and screens" para. 14), the dominant role of digital technology in education suggests it may replace the foundational learning experience that books provide to young, developing minds. Further, reliance on educational children's television instead of children's books stifles creative exploration and curiosity.

Developmentally, screen time usage correlates with memory, affecting multiple other learning abilities. In a study conducted by Zhang about cross-sectional associations between screen time and cognitive development in preschoolers, findings suggest that excessive screen time affects working memory. (Zhang et al., 2021, p. 107). Therefore, there is a correlation between screen time usage and cognitive development functions, like working memory, "the site of ongoing cognitive activity" that is "allocated to the cognitive processes responsible for determining the meanings of individual words" and "briefly [storing] results of analyses" to "give meaning to words and sentences" (Kail & Barnfield, 2021 as cited in Baddeley, 2012, p. 175). A preschooler's ability to utilize cognitive functions like working memory is crucial for literacy development. Difficulty using working memory suggests challenges in processing and retaining language-related information, which are key milestones in preschool learning. These challenges threaten a child's ability to listen and comprehend new words and their meanings.

The absence of foundational skills developed through building blocks hinders a child's ability to meet academic expectations and acquire essential skills in kindergarten. Following the Alberta Kindergarten Curriculum, children are expected to "[comprehend] and [respond] personally and critically to oral, print, and other media texts" (Alberta Education, 2011). While screen time usage affects cognitive processes, it also affects social development. Pappas concludes that screens "could displace the kinds of face-to-face interactions that actually help young kids learn" (2022, "babies, toddlers, preschoolers, and screens" para. 14), insinuating a possible decrease in socialization processes, like interactions with friends and peers.

Vygotsky's sociocultural theory of cognitive development reinforces the significance of social interactions in development by arguing that "children learn through guided participation and collaborative dialogues with more knowledgeable others, such as parents, teachers, and peers" (Clemente-Suárez, 2024, p. 6). His theory suggests that reducing physical interaction between

children and peers is particularly destructive, as it deprives them of interpersonal interactions and socialization, hindering the development of "social cognition, empathy, and emotional regulation skills" (Clemente-Suárez, 2024, p. 6).

Social and cognitive development are equally critical when considering the effects of excessive screen time usage in young children, as they often overlap and affect multiple developmental aspects. Badarneh's study of the association between executive functions, "a family of top-down neurocognitive processes involved in conscious, goal-directed behaviour, and control of thought and emotion processes" and social cognition, "neurocognitive processes through which people perceive, interpret, remember, process, and apply information about themselves and others within the social realm" in the childhood years, asserts that the core executive functions (inhibitory control, working memory, and cognitive flexibility), are correlated with both cognitive and affective social cognition (2024, pp. 1-2). This association underscores the potential impact of excessive screen time on young children's social cognition and executive functioning, while emphasizing how it exacerbates challenges in critical areas of development.

As per the Alberta Kindergarten Curriculum, the "personal and social responsibility" of students to "[experience] and [express] feelings in socially acceptable ways" (Alberta Education, 2011) within the classroom, demonstrates how social cognition and executive functions work together. Evidently, when excessive screen time usage disrupts the ability of both functions to work effectively, young children struggle with emotional regulation and cooperation in classroom settings.

Technology and Attention Span in School-Aged Children

As advancements in digital technology continue to shape daily life in the digital age, it also redefines the nature of childhood, extending to the fundamental component of education. Schools are increasingly integrating technology use into education by utilizing digital learning platforms like Google Classroom to organize courses, assign assessments, and facilitate group discussions. The additional use of technology in schools reinforces children's increased exposure to digital media.

A Canadian study regarding digital media use in school-aged children's everyday lives reported that "three-quarters of Canadian parents are concerned about how much time children spend using social media." (Ponti, 2019, "school aged children: impacts on development and mental health", para. 4). This finding suggests a growing concern of the potential risks associated with increased media consumption in children. Not only were parents concerned for their children's well-being, but "one-third of students" were also "concerned about the amount of time they spend online" (Ponti, 2019, "school aged children: impacts on development and mental health", para. 4), indicating an increasing need for screen time regulation inside and outside the classroom. Children's agency in how they engage with technology, coupled with parents growing apprehension about their children's educational experiences, validates the "[increasing] [requirement] of digital media at home and in school" (Ponti, 2019, "school aged children: impacts on development and health", para. 4).

Early media presence within childhood further affects children as "entertainment TV, video

games, and social media take up more leisure time, usually by age 8" (Ponti, 2019, "school aged children: impacts on development and health", para. 4). Media's growing role in childhood has reduced children's participation in other leisure activities, including extracurricular activities. Additionally, "dividing attention between two or more devices simultaneously ("media-multitasking") makes learning especially difficult" (Ponti, 2019, "risks", para. 4). When children attempt to complete assignments while watching educational videos, their attention is divided between two tasks, reducing the focus on both. Schools should be wary of technology use during classroom activities and tasks, as it encourages multitasking and negatively affects "academic outcomes" (Ponti, 2019, "risks", para. 4). Multitasking is a common yet dangerous habit many children develop to balance the digital and physical tasks involved in classroom assessments. However, students and teachers should be aware of its negative consequences, which "disrupt reading efficiency, impair problem-solving and may undermine children's confidence in their ability to do homework" (Ponti, 2019, "risks", para. 4).

Another research study conducted by the Quebec Study of Child Development on early screen media exposure and cognitive abilities observed that each time TV exposure was increased by one hour at age two, "a 7% unit decrease in participation in class and 6% unit decrease in math proficiency" was found (Muppalla et al., 2023, p. 2). Findings suggest that a link between media consumption may be associated with cognitive and social development. Class participation requires cognitive skills such as attention and memory, along with social functions like interpersonal communication to share ideas and collaborate with others. Math proficiency requires children to engage in cognitive skills like problem-solving and critical thinking, while social functions of group work help stimulate idea sharing and collaboration to enhance problem-solving. TV exposure at age two affecting learning and functioning in fourth grade, insinuates that early screen exposure has long-term impacts on cognitive and social development.

Piaget's theory of cognitive development "posited that children progress through a series of stages of cognitive development, each characterized by different abilities and ways of thinking" (Clemente-Suárez et al., 2024, p. 6). Early exposure to television in the sensorimotor stage, "the first of Piaget's four stages of cognitive development" that "spans birth to 2 years old" in which "the infant progresses from simple reflex actions to symbolic processing" (Kail & Barnfield, 2021, p. 164) is associated with prolonged development of foundational skills necessary for progression within the other three stages (preoperational, formal operational, and concrete operations.) Psychologists Kail and Barnfield characterize the sensorimotor stage by three critical domains of development: "adapting to and exploring the environment, understanding objects, and using symbols" (2021, pp. 164-165). These three aspects of the sensorimotor stage develop through direct engagement with the physical environment and active, interactive learning experiences. Therefore, additional time spent watching television results in less physical, hands-on experience, leading to delayed acquisition of skills.

Social Media's Influence on Young Adolescents

Media consumption in young adolescents is arguably the most worrisome, as they exercise greater autonomy in their media usage and choices compared with younger children. This

increased independence makes them more susceptible to the dangers of media consumption, such as mental health issues and body image struggles. The growing consumption of short-form content affects early adolescents by lowering their self-esteem through the reinforcing of unrealistic standards and idealized lifestyles perpetuated through popular social media apps, like Instagram and Tiktok.

Lafontaine-Poissant conducted a Canadian study on the impact of social media use on sleep health in adolescents aged 11-17. A distinction was made between "the presence of addiction-like symptoms" either, intense "spending a lot of time on social media" or problematic, "implicates the presence of behavioural and psychological symptoms of addiction that affect daily functions" (2024, pp. 338-339). Results revealed that "intense and problematic social media use were associated with greater odds of poor sleep health among adolescents in Canada, with stronger associations among girls than boys" (Lafontaine-Poissant et al., 2024, pp. 338-339). This finding suggests a distinction in content preferences between genders and discrepancies in effects. Additionally, because "sleep is essential to the health and development of adolescents and a contributor to their well being through its influence on learning capacities, emotional regulation, and memory processes" (Lafontaine-Poissant et al., 2024, p. 339), effective learning is compromised due to reduced cognitive capacities and unsustained attention, leading to poor performance on academic assessments. Further, difficulties in emotional regulation may manifest through increased irritability and difficulty collaborating with peers.

Leon Festinger's social comparison theory proposes that "individuals determine their self-worth by comparing themselves to others" (Kayala et al., 2023, "introduction" para. 1). They tend to "use other people as sources of information" to determine how they are doing "relative to others" or how they "should behave, think, and feel." (Kayala et al., 2023, "introduction" para. 1). His theory suggests that social media usage influences early adolescents through the saturation of content that emphasizes a romanticized version of other people's lives and curated beauty standards. Constant viewing of this content reinforces cognitive and behavioural patterns that encourage the adoption of ideals related to lifestyle and appearance. Young adolescent's engagement with media shapes their self-concept, which influences how they think, behave, and feel about themselves.

Conclusion

Media consumption and screen time uniquely affects children of all ages. While technology is not inherently harmful, it perpetuates harmful behaviour like reduced attention spans, which leads to difficulty learning and comprehending information in school environments. In the first years of life, hands-on experience while interacting with one's environment is imperative to developing lifelong skills, like social and cognitive functions, throughout childhood and early adolescence. When media consumption outweighs interaction with the environment, children are susceptible to delayed developmental milestones, leading to learning challenges in school-aged children. Parents and educators should regulate technology use within school settings and at home due to its harmful effects on social functions and cognitive skills. Greater awareness of the dangers surrounding excessive technology use in children, parents, and teachers is also imperative to ensure children's healthy and typical development.

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