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DIGITAL MEDIA AS CATALYSTS FOR CHILDHOOD LEARNING: challenges and perspectives

MÍDIAS DIGITAIS COMO PROPULSORAS DAS APRENDIZAGENS NA INFÂNCIA: desafios e perspectivas

LOS MEDIOS DIGITALES COMO IMPULSORES DEL APRENDIZAJE INFANTIL: retos y perspectivas

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Abstract
From the earliest age, children are immersed in Information and Communication Technologies (ICT), as they communicate and play with tablets, smartphones, games, and other electronic devices. It is believed that recreational activities mediated by digital screens contribute to the construction of subjectivities and learning, characterizing the existence of a children's cyberculture, as children imprint their habits and behaviors when interacting with digital media. The purpose of this research, therefore, is to discuss the contributions of ICT to children's learning and development, without disregarding the risks arising from its excessive use. Media dependence can lead to problems for children's physical and mental health, such as increased anxiety, exposure to violence, cyberbullying, sleep disorders, and sedentarism. Of a bibliographic and documentary nature, this research aims, from a critical and dialectical framework, to demonstrate the importance of the partnership between school and family in fostering a safe and dialogical relationship between children, digital culture and its various technological artifacts. Through play, children learn in a more enjoyable and pleasurable way, provided that such activities are mediated by the family and intentionally planned within the educational setting. Therefore, it is essential that both institutions understand and appropriate digital technologies in ways that contribute to a more welcoming and less alienating form of digital education in childhood.

Keywords: Child. Technologies. Learning. Challenges.

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Resumo
Desde muito pequenas, as crianças são imersas nas Tecnologias da Informação e Comunicação (TIC), pois se comunicam e brincam com *tablets*, *smartphones*, jogos e outros dispositivos eletrônicos. Acredita-se que as atividades lúdicas mediadas por telas digitais contribuem para a construção das subjetividades e das aprendizagens, caracterizando a existência de uma cibercultura infantil, uma vez que as crianças imprimem seus hábitos e comportamentos ao interagirem com as mídias digitais. O propósito desta pesquisa, portanto, é discutir as contribuições das TIC para a aprendizagem e o desenvolvimento infantil, sem, contudo, desconsiderar os riscos decorrentes de seu uso excessivo. A dependência das mídias pode acarretar problemas para a saúde física e mental das crianças, como aumento da ansiedade, exposição à violência, *cyberbullying*, distúrbios do sono e sedentarismo. De caráter bibliográfico e documental, esta pesquisa pretende, a partir de uma perspectiva crítica e dialética, demonstrar a importância da parceria entre escola e família na construção de uma relação segura e dialógica das crianças com a cultura digital e seus diversos artefatos tecnológicos. Por meio das brincadeiras, as crianças aprendem de forma mais divertida e prazerosa, desde que essas atividades sejam orientadas pela família e planejadas intencionalmente no contexto escolar. Dessa forma, é fundamental que ambas as instituições compreendam e se apropriem das tecnologias de modo a contribuir para uma educação digital mais acolhedora e menos alienante na infância.

Palavras-chave: Criança. Tecnologias. Aprendizagens. Desafios.

Resumen
Desde muy pequeños, los niños están inmersos en las Tecnologías de la Información y la Comunicación (TIC), comunicándose y jugando con tabletas, teléfonos inteligentes, videojuegos y otros dispositivos electrónicos. Se cree que las actividades lúdicas mediadas por pantallas digitales contribuyen al desarrollo de la subjetividad y el aprendizaje, caracterizando la existencia de una cibercultura infantil, ya que los niños imprimen sus hábitos y comportamientos al interactuar con los medios digitales. Por lo tanto, el propósito de esta investigación es analizar las contribuciones de las TIC al aprendizaje y el desarrollo infantil, sin ignorar los riesgos derivados de su uso excesivo. La dependencia de los medios puede provocar problemas de salud física y mental en los niños, como mayor ansiedad, exposición a la violencia, ciberacoso, trastornos del sueño y sedentarismo. Esta investigación bibliográfica y documental busca, desde una perspectiva crítica y dialéctica, demostrar la importancia de la colaboración entre la escuela y la familia para construir una relación segura y dialógica entre los niños y la cultura digital y sus diversos dispositivos tecnológicos. A través del juego, los niños aprenden de forma más lúdica y amena, siempre que estas actividades sean guiadas por la familia y planificadas intencionalmente en el contexto escolar. Por lo tanto, es fundamental que ambas instituciones comprendan y adopten la tecnología para contribuir a una educación digital más acogedora y menos alienante en la infancia.

Palabras clave: Niño. Tecnologías. Aprendizaje. Desafíos.

Introduction

Information and Communication Technologies (ICT) have been transforming various sectors of society through the continuous advancement of

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telecommunications and digital media. These innovations have promoted significant changes across all areas, providing substantial improvements in quality of life and in the ways we relate to the world around us.

Given the central role that media and technologies play in contemporary society, they not only influence how we construct our perceptions of reality but also act as mediators that shape behavior and interactions within the family, school, and other social spheres. In the educational context, for example, it is evident that schools have been striving to keep pace with changes brought about by the expansion of digital media, especially due to children's increasingly early access to the internet and computers.

It is a fact that, from a very early age, children coexist with technologies and develop skills through different electronic devices, such as computers, tablets, smartphones, and other technological artifacts (Inácio *et al*., 2019; Fantin, 2020; Paschoal, 2023).

This coexistence enables communication among children through message exchanges, electronic games, play activities, image sharing, and other experiences, thereby producing subjectivities and ways of being and relating within the digital universe (Couto, 2013; Inácio *et al*., 2019).

Born immersed in the technological world, children are part of the so-called "Net Generation", a term used by Tapscott (2010) to refer to children of the connection era, especially those born in the twenty-first century. According to the author, new generations organize themselves through interactivity, as they tend to be more active and argumentative rather than merely spectators or passive consumers when engaging with technological language.

Young people contribute to the transformation of all "institutions of modern life; from the workplace to the marketplace, from politics through education to the basic unit of any society" (Tapscott, 2010, p. 16). Thus, it is likely that "a young person from the internet generation turns on the computer and simultaneously interacts with several different windows, talks on the phone, listens to music, does homework, reads a magazine, and watches television" (Tapscott, 2010, p. 32).

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In this sense, we believe that children have the right to access and enjoy technological resources for learning purposes. However, it is the responsibility of families and institutions to adapt in order to reduce potential risks arising from the inappropriate use of these tools, as indicated by the Brazilian Society of Pediatrics (SBP) (Brasil, 2024).

The frequent use of technologies from early childhood can generate significant impacts on behavior and health, influencing habits through the digital world. Although technologies may be incorporated into the school environment from the early years of Basic Education, their excessive use poses risks such as increased anxiety, sleep and eating disorders, sedentary lifestyles, and difficulties in learning and socialization. These effects result from the growing dependence on digital media, which, although fostering new ways of learning, can also harm physical and mental health (Armstrong and Casement, 2001; Carlsson and Feilizen, 2002).

Partnerships between families and schools are essential in the educational process, especially regarding the use of digital technologies. Rather than restricting access to these resources in school contexts, which could limit the development of digital literacy, parents and teachers may act as guides, supporting children as they explore these tools (Inácio *et al*., 2019).

Although Brazilian legislation protects children's rights by criminalizing the dissemination of images or content that may compromise their physical and moral safety (Brasil, 1990; Brasil, 2018), responsibility for monitoring daily internet use falls primarily on families and schools. Furthermore, it is essential to create and implement public policies and educational campaigns aimed at the "prevention of risks related to the use of the internet, social networks, video games, and many other applications" (Brasil, 2019, p. 4).

It is within this context that the importance of the present study lies. While acknowledging the role of technological artifacts in the educational field, we also recognize that their early use without adult mediation may compromise children's physical and mental health. This bibliographic study aims to discuss the contributions of technologies to learning and child development, without disregarding the risks arising from their excessive use.

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Although recognized by law as citizens and rights-bearing subjects (Brasil, 1988; Brasil, 1990), a major challenge remains: ensuring that all children fully experience childhood through play, fantasy, imagination, and access to education from birth, including access to Information and Communication Technologies. Replacing excessive engagement with games and videos with more meaningful social interaction activities, those that contribute more effectively to learning and children's cognitive and emotional development, is a responsibility shared by families, schools, and public authorities. Therefore, collaboration among members of the digital protection and safety network is essential, as all share responsibility for safeguarding children in virtual environments.

The Education of Connected Children: Between the Real and the Virtual

Reflecting on childhood means returning to the beginning of life, a stage marked by laughter and tears, play and imagination, as well as countless discoveries and surprises. It is also a constant attempt to understand and conquer a world that gradually reveals itself through the senses and lived experiences (Paschoal and Machado, 2007; Mello, 2007). Thinking about this period simultaneously evokes memories of our own childhood experiences, whether pleasant, sad, enchanting, playful, or challenging. In reality, each of us constructs a conception of childhood based on the child we once were or on the relationships established with other children with whom we have interacted.

The way each child experiences childhood is directly linked to their social context, particularly their social class, which highlights the diverse realities that shape this stage of life. From a historical perspective, in ancient societies, childhood was not afforded recognition regarding its specificities, as children lived almost invisibly, without social protagonism (Ariès, 1981; Kramer, 2003).

In the contemporary context, children are recognized as citizens and rights-bearing subjects, as established in Brazilian legislation (Brasil, 1988; Brasil, 1990). This allows us to assert that the conception of childhood is a historical

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construction, subject to transformations over time, as it does not present itself uniformly within a given culture or historical period (Kramer, 2003).

Within this scenario, essential reflections emerge, such as: Who is the child for us? How does the child understand the world around them? How do children play? How do they relate to and appropriate digital technologies? What competencies do they demonstrate? These questions are fundamental, as it is from our understanding of who the child is, and how they learn and develop, that we construct educational practices and contribute to their formative processes.

To address these issues, it is important first to distinguish between the concepts of "child" and "childhood". Children have existed since the beginning of humanity; however, the notion of childhood as a distinct stage of life is a social construction that began to take shape between the seventeenth and eighteenth centuries (Sarmento, 2008). When considering the child in contrast to the adult, whether in terms of age or level of maturity, the child is often perceived as an incomplete being who must develop in order to reach adulthood (Franco, 2006; Sarmento, 2008).

This adult-centered perspective reduces childhood to a transitional stage, subordinated to the future. However, according to Franco (2006) and Kramer (2003), when childhood is understood as a historical and social construction, it becomes inappropriate to assume the existence of a homogeneous childhood. Historical processes reveal multiple childhoods, marked by diverse and unequal experiences of socialization (Kramer, 2003; Paschoal and Machado, 2007).

While children from more privileged social classes often experience an abbreviated childhood due to an intense schedule of daily commitments, such as English classes, sports, swimming, and computer courses, those living in situations of extreme poverty are also deprived of fully experiencing childhood, as they frequently assume responsibilities typical of adult life (Kramer, 2003; Paschoal and Machado, 2007).

As Franco (2006, p. 31) emphasizes, "there are many possible definitions of childhood, since, as a historical concept, it varies according to the context in which it is situated". Thus, it is understood that the idea of childhood has been transformed over time and, in contemporary society, presents itself as a dynamic construction

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shaped both by adults and by children themselves (Sarmento, 2008). The concept of childhood "emerges in the historical and social context of modernity, with the reduction of infant mortality rates, due to scientific advances and economic and social changes" (Kramer, 2003, p. 18).

Through interactions with adults and other children, children construct meanings and representations related to the symbols, actions, and languages present in their daily lives (Gomes, 2008). In symbolic play, for example, "children produce a reality that is different yet simultaneously similar to everyday life. It is a form of enactment that allows for conflict, interaction, and multiple languages" (Gomes, 2008, p. 186).

From this perspective, children are embedded in a broad network of shared knowledge and social relationships that extend beyond the family and school environment. Through digital media, such as television, cartoons, theater, music, and other cultural forms, they gain access to culture. For this reason, all generations involved in social, historical, and cultural processes hold significant relevance (Gomes, 2008). Each stage of life presents its own particularities and characteristics, with childhood being one of them.

According to Couto (2013), childhood is a period of life influenced by multiple elements, including cultural, political, social, economic, family, and educational aspects. Within this context, there is continuous interaction between adults and children, in which both participate in teaching and learning processes.

Unlike previous generations, today's children are immersed in the daily use of technologies such as computers, tablets, and smartphones. This familiarity allows them to use these resources spontaneously to interact, build friendships, learn, play, and share their experiences within digital environments, as highlighted by Couto (2013).

The so-called children's cyberculture manifests itself in the ways children relate to electronic devices. Through these interactions, they express behaviors, habits, and ideas that are shared and often re-signified in virtual environments. In general terms, cyberculture can be understood as a way of life mirrored in social networks and in

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the various interactive and participatory processes that occur within these spaces (Armstrong and Casement, 2001).

This phenomenon contributes to the formation of subjectivities and modes of human coexistence, influencing and transforming ways of being and relating in society (Lévy, 1999; Feilizen, 2002; Tapscott, 2010; Couto, 2013). In this sense, interaction with digital devices during childhood goes beyond practical use; it becomes almost an extension of the subject, characterized by speed, interactivity, dynamism, and accessibility. As Couto (2013) explains:

> Digital culture favors children, enabling and enhancing intellectual conditions that allow them to participate in digital media and increasingly recognize themselves as authors within this environment. Connected children are pioneers in the society of digital technological imagination, as they feel they are creating their own terrain of adventure, inventing something new, and differentiating themselves from previous generations without having to justify themselves (Couto, 2013, p. 904).

Inácio *et al*. (2019), argue that being born into a hyperconnected society facilitates children's access to and development of skills related to the use of mobile devices, such as computers, video games, tablets, electronic games, and other digital apparatuses. Adults themselves have become increasingly dependent on technology, resulting in an "inversion of authority, as children often assist adults with the various functions of electronic devices" (Inácio *et al*., 2019, p. 42).

In this context, education emerges as a possibility for comprehensive formation that integrates rationality and sensitivity. It is therefore necessary to understand and use technologies in a critical, participatory, and reflective manner, especially within pedagogical practices. Collaborative work between schools and families is essential to ensure that children are not exposed exclusively to the virtual world. Rather, it is important that they establish dialogical relationships and social interactions with family members, peers, teachers, and other social institutions.

> Within this process, it is impossible to deny the social and educational benefits that technological artifacts can offer. One need only imagine contemporary life without computers or mobile phones connected to the internet. Digital technologies, in addition to facilitating expression,

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> communication, and interpersonal relationships, have the potential to stimulate children's reasoning and creativity (Inácio, *et al*., 2019, p. 42).

Digital technologies can therefore be allied with educational practices, as they contribute significantly to teaching and learning processes. Through their use, it is possible to enhance children's imaginative capacity, fostering the development of more critical thinking, as well as to "develop different languages, forms of knowledge, and character simulations as constitutive elements of integrative worldviews" (Inácio *et al*., 2019, p. 43).

The incorporation of technological artifacts into everyday school practices becomes essential for the development of collaborative activities that are meaningful to children, provided that such activities are intentionally planned and mediated by teachers. The authors clarify that "although technologies are not a magical solution to educational problems, they can contribute to the collective reconstruction of social learning" (Inácio *et al*., 2019, p. 43).

Fantin (2018, p. 41), argues that the school environment can function as a "platform for dialogue among different sensibilities and needs, dealing with the plurality of knowledge, sources, and interactions from the perspective of learning to interconnect information, knowledge, and languages". In this way, various technological artifacts, such as photography, cinema, radio, social networks, computers, among others, may be incorporated into pedagogical proposals within educational institutions.

> Within the multiplicity of languages and metalanguages articulated through linguistic design, writing, audiovisual, sound, gestural, spatial, and multimodal dimensions, numerous possibilities emerge for dialogue among the fields of education, art, and culture. These interactions allow curricular content to be meaningfully related to students' daily experiences and lived realities (Fantin, 2018, p. 42).

From this perspective, the classroom can become a fertile space for learning situations that integrate culture, art, and communication with diverse bodies of knowledge constructed through the school curriculum (Fantin, 2018). Such integration promotes more meaningful, critical, and interdisciplinary education (Lévy, 1999; Armstrong and Casement, 2001; Feilizen, 2002).

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According to Amante (2007), it is essential that digital media be integrated into the school context from the earliest stages of Basic Education in a planned manner, as they make it possible to broaden, enrich, and diversify curricular objectives, while also enhancing children's learning experiences.

For this reason, the author advocates the use of technologies as a valuable resource for designing pedagogical proposals for children, since work carried out "around computers is particularly stimulating for interaction, encouraging children to communicate both with one another and with adults" (Amante, 2007, p. 57).

Beyond simply meeting children's immediate needs, teachers are responsible for fostering meaningful exchanges during and after activities, transforming these moments into rich learning opportunities. In this context, teacher education becomes essential for changing pedagogical practice, as it enables the recognition of more conscious and reflective uses of technologies in daily work with young children.

According to Amante (2007, p. 58), several aspects are particularly relevant and should be considered in teacher education processes, especially the need to "help teachers understand how the work they typically carry out with students and the experience they already possess can be adapted through the development of activities that involve the use of technology". The creation of spaces that encourage collaborative work and the sharing of successful pedagogical experiences should also be valued within professional development.

Within the diversity of experiences promoted through teacher education, it is important not to overlook "aesthetic experience, sensory knowledge, bodily knowledge, and their transformations within the scope of sensitivity and cognition fostered by digital technologies" (Fantin, 2020, p. 5). Despite the widespread adult assumption that children learn to use electronic devices almost entirely on their own, Fantin (2020) argues that this autonomy occurs primarily at an instrumental level.

In the realm of critical reflection, the "mediation of the other, of questioning, and of the destabilization of certain hypotheses and certainties is necessary, leading students to reflect on their cultural and media practices" (Fantin, 2020, p. 9), particularly regarding the content they access and share.

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> At the same time, mediation involves negotiation and the movement of meanings from one context to another, from one discourse to another, and from one event to another. This understanding allows mediation to be seen as a constant transformation of meanings, which also constitutes an integral part of the formative process (Fantin, 2020, p. 10).

Despite their strong appeal, digital media may pose risks to health, especially when used excessively. Continuous engagement with online games and applications focused on videos and films can compromise social interaction and negatively affect academic performance (Brasil, 2024). Therefore, it is essential for families to play an active role in regulating the amount of time children spend connected to the internet, whether on tablets, smartphones, or other electronic devices.

Families are responsible for supervising the content accessed by children online. Ideally, computers should be located in visible and easily accessible areas of the home, allowing parents or guardians to monitor usage. Furthermore, according to guidelines issued by the Brazilian Society of Pediatrics (SBP) (Brasil, 2019; 2024), it is recommended that screen time be reduced and replaced with more interactive activities, such as play, sports, or outdoor experiences in contact with nature.

Accordingly, screen exposure time should be adjusted according to each child's or adolescent's age and stage of cognitive, emotional, and social development (Armstrong and Casement, 2001).

Children under two years of age should not be exposed to digital media, as during this early stage of life, direct interaction with adults and other children contributes far more significantly to the development of language, cognition, and social skills than early exposure to electronic devices (Brasil, 2019; 2024).

For children between two and five years of age, screen exposure should be limited to a maximum of one hour per day, considering total time spent watching television or using smartphones, tablets, or video games. From six years of age onward, the recommended limit increases to up to two hours per day, always under supervision and with content restrictions appropriate to each age group (Brasil, 2019; 2024).

It is not recommended that children aged zero to ten have televisions or computers in their bedrooms, according to the SBP (Brasil, 2019; 2024). Therefore, it is important for families to establish specific times for the use of these devices and to

accompany children during access, assisting them in interpreting content such as online games or television programs.

Collaborative work between families and schools supports digital education in early childhood; however, digital literacy among parents and teachers is fundamental to this process. Thus, children's digital language must be understood by both institutions, as Müller and Fantin (2022) emphasize the importance of considering children's needs and sensitivities, particularly with regard to their sense of belonging within socialization environments.

Within this scenario, the central role of mediation carried out by families and educational institutions becomes evident. Such mediation should focus on fostering the development of multiple forms of children's expression, promoting a conscious and balanced use of screens. By acting as mediators, adults have the opportunity to enrich children's cultural experiences, making constructive use of the opportunities provided by digital media.

The advantages that information and communication technologies offer to children, particularly in terms of expression, communication, and social interaction, cannot be ignored. Nevertheless, it is essential that the use of these tools be accompanied by adults (Inácio *et al.*, 2019; Müller and Fantin, 2022). It is precisely at this point that the importance of families and schools becomes evident, as they update their practices and learn to engage in dialogue with children's interests, incorporating technological resources in ways that redefine their applications and promote a more dialogical and critical digital education.

In light of the various challenges involved in achieving a more humanized and less alienating digital education in childhood, three main aspects deserve emphasis: first, encouraging parental participation in mediating technology use alongside digital literacy initiatives in schools, supported by ethical guidelines for healthy technology use (Brasil, 2019; 2024); second, the need to comply with and respect social protection legislation that ensures safe access to technologies (Brasil, 2018); and finally, social responsibility in preventing risks and protecting the physical and mental health of children and adolescents in the digital age.

The construction of a more critical and reflective digital education is possible from early childhood. However, parents and teachers must become familiar with

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technological language and the modes of communication characteristic of this generation. Together, they can use Information and Communication Technologies in more humanizing and healthy ways.

Final Considerations

This study provided an opportunity to reflect on the contributions of Information and Communication Technologies (ICT) to children's learning processes and integral development. Marked by intense digital connectivity, contemporary childhood reveals that early contact with digital technologies not only becomes part of children's socialization processes but also directly influences their educational formation from the earliest years of life.

When compared to many adults, children demonstrate greater dexterity in handling electronic devices such as smartphones, tablets, computers, and other technological resources, using them naturally in their daily routines. On the other hand, although technologies can enrich learning processes, it is essential to recognize that excessive or inappropriate use may compromise children's physical and mental health. For this reason, an active partnership between schools and families is fundamental in guiding children regarding the use of these resources.

Moreover, adults must regulate both the duration of screen exposure and the type of content accessed by children, as easy access to instant information may encourage passivity and alienation, hindering the development of critical and autonomous thinking. In this process, open dialogue among families, schools, and children is essential for establishing clear guidelines for the safe and responsible use of the internet, with particular attention to privacy protection and digital safety.

Through interactions with digital screens, children have the opportunity to learn in more playful and pleasurable ways, especially when these experiences are mediated by families and intentionally planned by schools. The incorporation of technological languages should therefore be integrated into pedagogical practices within educational contexts, given that children are exposed to a wide range of technological devices from a very early age.

The major challenge lies in balancing access to technologies with the appreciation of free play, outdoor activities, and peer interactions, moments in which imagination, fantasy, enchantment, and joy are expressed intensely. Such experiences promote meaningful learning and respect the singularities of childhood.

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