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Growing Up in the AI Era: Digital Dependency and the Transformation of Childhood Values

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Abstract : This study analyzes the profound and multi-layered transformations impacting childhood in the age of artificial intelligence (AI), particularly within socially and environmentally unstable contexts such as forced migration, poverty, and climate-related displacement. It argues that the child is no longer formed within traditional frameworks—like family or school—but rather within algorithmic digital environments that reconstruct knowledge, reshape emotions, and reprogram values and behaviors.

The analysis focuses on three interrelated dimensions: (1) **cognitive development**, which may be accelerated by AI tools but often at the cost of imagination, creativity, and reflective autonomy; (2) **hidden behavioral addiction**, rooted in algorithmic repetition, digital rewards, and emotional programming that alter children's attentional and emotional patterns; and (3) **value formation**, through which consumerist, globalized norms are subtly imposed at the expense of local cultures, especially among migrant, refugee, and low-income children.

The study underscores that these digital environments operate differently across demographic and socioeconomic lines, with children in vulnerable communities often exposed to unregulated content, lacking access to critical pedagogy, and facing digital dependency without institutional safeguards. Despite its conceptual depth, the study recognizes the absence of empirical data as a limitation: no case studies, demographic breakdowns, or direct observation from affected communities are currently included.

It concludes that AI acts as a **dual force**—educational in potential yet hegemonic in structure—necessitating urgent ethical, pedagogical, and policy responses that are culturally grounded, socially inclusive, and informed by the lived realities of children in precarious settings.

Keywords: Artificial Intelligence - Childhood Vulnerability - Cognitive Development - Behavioral Addiction - Value Formation

Research Problem

Contemporary childhood is undergoing radical transformations due to the rapid infiltration of artificial intelligence technologies into daily life, particularly in the educational and cognitive domains. Children no longer receive knowledge solely from family or school; instead, they interact from their earliest years with smart applications, talking robots, and virtual characters powered by real-time learning and response algorithms—marking a near-complete rupture from traditional socialization methods based on sensory experience and human storytelling (Livingstone & Blum-Ross, 2020).

This shift toward digital socialization has produced a new educational environment where the "algorithmic educator" holds more influence than the teacher or parent. AI does not merely deliver information—it redirects children's attention, shapes their desires, and structures their emotions using design mechanisms rooted in immediate reward and gratification, as highlighted by theories of behavioral addiction (Griffiths, 2005; Twenge & Campbell, 2018). Human interaction is thus replaced by algorithmic systems that monitor, guide, and reshape awareness through meticulously engineered behavioral responses.

This transformation raises a fundamental dilemma regarding the pedagogical limits of technology. Though seemingly neutral or educational, smart content often embeds coded values and symbols that are planted in the child without conscious awareness, ultimately reshaping their worldview within a cultural and ideological system driven by digital market logic rather than authentic social values. The child shifts from being an active learner to a "programmed subject" within a system designed to produce predictable and controllable behavior—rather than critical thinking and creativity freedom (Hachemi, 2017).

Such changes also signal a reconfiguration of educational values. A child who learns from a voice assistant, listens to stories through smart apps, and interacts with virtual characters is being emotionally and socially restructured through non-human communication patterns—impacting self-construction, emotional development, and interpersonal relationships. This raises crucial questions about the future role of families and schools amid the expanding authority of algorithms, and about who holds the educational and cognitive decision-making power in a child's digital life.

Central Research Question

To what extent does artificial intelligence contribute to reshaping childhood cognitively, behaviorally, and morally? And in this accelerated digital environment, is the child a free agent capable of critical engagement—or is he/she being transformed into a subject

molded by algorithmic logic that reproduces standardized behavioral and cognitive models?

Conceptual Definitions

1. Artificial Intelligence

Artificial intelligence is defined as the ability of digital systems to perform complex cognitive tasks that typically require human intelligence, such as perception, learning, decision-making, and problem-solving.(Russell & Norvig, 2021)

It is the simulation of human behavior by machines using software and algorithms capable of self-learning and interacting with the environment, ultimately reaching independent decision-making.(Al-Faqi, 2012)

Artificial intelligence is a computing system capable of modifying its behavior based on the analysis of past data, aiming to improve performance and make decisions without direct human intervention.(Nilsson, 1998)

2. Childhood

Childhood is a biological, psychological, and social life stage in which the fundamental functions of the self are formed; it is a foundational period for building personal and social identity.(Piaget, 1970)

Childhood is understood as a social and cultural construct that varies according to changing social contexts and systems, and not merely a natural biological phase.(James & Prout, 1997)

Childhood is a historical social condition reflecting society's perceptions of children, reshaped through institutions of socialization such as the family, school, and media.

3. Cognitive Development

Cognitive development is the process by which a child's thinking, perception, language, and memory evolve through organized developmental stages.(Piaget, 1952)

It is a social and cultural interaction that contributes to the construction of higher mental functions through mediation between the child and their environment.(Vygotsky, 1978)

Cognitive development is the trajectory by which a child enhances their ability to understand, analyze, and learn through the interaction of environment and genetics.(Flavell, 1985)

4. Behavioral Addiction

Behavioral addiction is the compulsive attachment to a certain behavior—such as the use of technology or gaming—despite awareness of its negative consequences, and is characterized by loss of control and social withdrawal.(Griffiths, 2005)

It is a psychological disorder manifested by an urgent and recurrent need to engage in a specific behavior due to the brain's habituation to the immediate stimulus it produces.(American Psychiatric Association, 2013)

Behavioral addiction is a type of addiction not related to external substances, but to a behavior that generates pleasurable feelings and becomes difficult to abandon, affecting daily functioning.(Young, 1998)

5. Value Formation

It is the process by which a child constructs a system of principles that guide their choices and behaviors, acquired through socialization and social institutions.(Rokeach, 1973)

Value formation is the gradual moral development a child undergoes through interaction with peers, adults, and institutions, shaping their ethical standards.(Kohlberg, 1981)

It is the progressive production of value identity within cultural and social contexts, influenced by traditions, religious discourse, education, and media.(Durkheim, 1961)

6. Symbolic Domination

Symbolic domination is a form of social control exercised without direct violence, through language, education, and culture, producing unconscious acceptance of the prevailing conditions.(Bourdieu, 1991)

It is the ability to impose certain modes of thinking and perceptions as natural and neutral, while concealing underlying class and ideological interests.(Bourdieu & Passeron, 1977)

Symbolic domination is a form of mental alienation exerted by media, education, and cultural elites through the reproduction and legitimization of power relations.(Chomsky, 1989)

7. Digital Environment

The digital environment is the informational space emerging from the development of communication technologies, encompassing digital platforms, interactive media, and smart content that reshapes both individual and collective consciousness.(Castells, 2001)

It is an integrated technological system combining software, hardware, and algorithmic structures that influence user behavior through real-time interactions.(Zuboff, 2019)

It is a communicative and cognitive space that reconfigures learning, play, and socialization relationships, characterized by immersion, customization, and behavioral control.(Livingstone, 2009)

Significance of the Study

The significance of this study stems from its engagement with one of the most complex issues in the digital age: **childhood vulnerability in the era of artificial intelligence**.

Artificial intelligence is no longer limited to a technical or functional role; it has evolved into a **cultural and educational actor** that reshapes the very structure of childhood—its behavior, emotions, and values. The scientific and social importance of this study lies in the following aspects:

- It highlights childhood as one of the most symbolically and behaviorally vulnerable groups in a context where smart media have become part of daily life, and algorithms have turned into tools for communication, learning, and guidance—often without clear accountability or sufficient educational oversight.
- It offers a **complex analysis** of the relationship between the child and technology through a central triad: **behavioral addiction, value transformation, and symbolic control**—an analysis that blends psychological, sociological, and symbolic dimensions to explain the deep changes affecting the very structure of childhood.
- It reveals the **hidden impact of algorithmic design** on shaping children's behavior, where digital content is not presented as a neutral educational tool but as an **encoded system** that reinforces cognitive and behavioral patterns based on instant reward and digital obedience.
- It reexamines the roles of traditional socialization agents (family and school), showing how AI infiltrates educational influence without facing **cultural immunity systems or alternative pedagogical models**, thereby causing imbalances in the socialization process.
- It opens a **new critical horizon** for dealing with artificial intelligence by questioning its symbolic and commercial structure and exposing its **educational and emotional risks** for groups unable to distinguish between technical interaction and hidden guidance.
- It paves the way for **developing informed digital educational policies** that balance human and technological interaction, and calls for integrating **critical and media literacy skills** into early education stages, aiming to build psychological and cultural resilience in children.

Hypotheses of the Study

This study is grounded in a set of theoretical hypotheses that seek to interpret the evolving relationship between artificial intelligence and childhood within the context of rapid social, educational, and cultural change. Drawing on recent literature in digital sociology, educational technology, and developmental psychology, the following hypotheses are proposed:

• **Artificial intelligence accelerates the acquisition of specific cognitive skills in children**, particularly in interactive and adaptive learning environments. However, it

may also diminish children's social and reflective capacities, especially when human interaction is reduced. This hypothesis aligns with studies highlighting the trade-off between screen-mediated engagement and interpersonal development (Livingstone & Blum-Ross, 2020; Papadakis et al., 2021).

• **Digital learning environments**, structured around instant gratification and real-time feedback, foster subtle forms of behavioral dependency. These environments may contribute to hidden digital addiction, which gradually undermines children's emotional regulation and psychological resilience. This draws on findings from behavioral psychology concerning attention loops and dopamine-driven reward systems (Anderson & Jiang, 2018).

• **Artificial intelligence systems transmit culturally embedded content that is often not value-neutral**, potentially leading to forms of value alienation among children. Exposure to commercialized and globalized narratives may promote consumerist behavior patterns at the expense of critical thinking and cultural identity, especially in contexts lacking parental mediation. This is supported by critical media studies and research on symbolic consumption in childhood (Chaudron et al., 2015; Brikel Hachemi, 2024).

This study adopts a theoretical-descriptive methodology, grounded in a critical reading of contemporary literature, media discourses, and sociological theory. It does not involve fieldwork, empirical data collection, or statistical analysis. As such, the findings and hypotheses presented are conceptual in nature and serve as a foundation for future empirical research in diverse cultural contexts.

Theoretical Framework

- **1. Cultural Capital Theory – Pierre Bourdieu**

  This theory is one of the most prominent tools for understanding the transmission of values and symbols within societies. Bourdieu (1986) argues that the child is produced and reproduced within what he terms *"cultural capital"*, which manifests in language, taste, and behavior. However, this educational environment is no longer exclusive to the family or school, as artificial intelligence technologies have begun to play the role of a *"algorithmic educator."* With this technological expansion, cultural capital is redistributed according to a new logic: those who possess the tools to navigate smart technologies and access algorithmically encoded knowledge enjoy cognitive advantages, while other children are left with general digital content produced for commercial or entertainment purposes (Brikel & Hachemi, 2017). This leads to a digital reproduction of class and cultural inequalities.
  Despite the theory's centrality, it has yet to fully incorporate the concepts of algorithmic control and smart media, necessitating an expansion of the "symbolic

field" to include digital platforms as spaces for the production of behavioral and cognitive disparities.

- **2. Social Learning Theory – Albert Bandura**

This theory asserts that children learn through imitation and observation of behavioral models in their environment (Bandura, 1977, 2001). However, these models are no longer limited to real people; they now include talking robots, voice assistants, and interactive characters embedded in games and apps. Here, the child interacts with *"artificial models"* programmed algorithmically to deliver specific content that directs behavior and reshapes emotional understanding. This new form of learning is not based on natural imitation but on manufactured simulation that promotes a singular consumerist and value-driven pattern, distant from human diversity and experiential learning (Brikel & Hachemi, 2014).

The theory has not yet developed adequate analytical tools to understand the *"artificial model"* and its emotional and communicative impact in the absence of live human relationships, opening the door to its renewal under the concept of *"non-interactive algorithmic learning."*

- **3. Behavioral Addiction Theory – Mark Griffiths**

This theory explains how repetition and immediate rewards lead to pathological attachment to smart applications, especially those designed to attract children and keep them engaged for extended periods (Griffiths, 2005). Algorithms are built on the principle of *"behavioral economics,"* constantly stimulating the child with animations, cheerful sounds, and virtual rewards that psychologically reinforce habitual use.

In this context, AI becomes a factor that not only produces learning but also fosters addiction, reshaping the child's internal motivations—where emotion becomes tied to external stimulation, and awareness of time and engagement in the physical world diminish.

The theory focuses on the psychological-behavioral dimension but overlooks the economic and political structures that produce this addiction model. Therefore, it is essential to connect it with the analysis of *data economics* and *surveillance capitalism* (Zuboff, 2019).

- **4. Symbolic Control Theory – Bourdieu and Chomsky**

This theory posits that cultural domination is not necessarily exerted through violence but through control over language, knowledge, and media (Bourdieu & Passeron, 1977; Chomsky, 1989). In the digital environment, this control turns

into a hidden algorithmic system of guidance that shapes the child's preferences and constructs their value and social awareness.
Smart systems transmit values through entertainment or educational interfaces, but they are, by design, subject to commercial or ideological agendas. Thus, cultural patterns are reproduced through children's games, recommended videos, and embedded advertisements, while neither the child nor the family possesses tools for critique or resistance (Hachemi & Brikel, 2015).
Although the theory is radical in nature, it has not yet developed effective tools for deconstructing digital control or incorporated the logic of the *"algorithm"* as a new cultural actor. This calls for its expansion to analyze *"invisible control"* through AI structures.

Methodological Considerations

Although this study is primarily conceptual and grounded in theoretical frameworks, it acknowledges the absence of original empirical data as a methodological limitation. No fieldwork, interviews, or observational studies were conducted to substantiate the claims discussed. The findings, therefore, remain speculative and indicative rather than generalizable.
Moreover, while the study emphasizes the potential risks posed by artificial intelligence to childhood development—particularly in terms of behavioral addiction and value alienation—it recognizes the need for a more balanced perspective. Future iterations of this research should critically engage with the educational and developmental benefits of AI, such as personalized learning, improved accessibility for children with learning difficulties, and enhanced cognitive engagement when used within pedagogically sound frameworks.
Thus, a more comprehensive analysis—grounded in both theoretical inquiry and empirical investigation—is necessary to fully understand the complex and context-specific implications of AI for childhood.

- **Childhood in the Grip of Artificial Intelligence: Between Cognitive Development, Hidden Addiction, and Value Formation**

  Over the past two decades, childhood has undergone profound transformations that have affected the foundations of traditional socialization and education. These shifts are largely due to the rapid infiltration of artificial intelligence (AI) technologies into the fabric of everyday life. The child is no longer a passive recipient of knowledge or entertainment, but rather an active participant embedded within intelligent interactive environments, algorithmically designed to

target their perception, shape desires, direct behavior, and assess cognitive and emotional performance in real time (Hachemi Brikel, 2018).

AI has entered the educational sphere forcefully—through adaptive learning platforms, virtual assistants, and interactive applications—making it a central component of contemporary childhood experiences. However, despite the promises of enhanced educational performance and cognitive expansion, these technologies also raise fundamental concerns related to behavioral and symbolic control, as well as the very deconstruction of the concept of childhood itself. This stage of development has become an open experimental space for digital market practices, where children's awareness is reshaped far from the influence of family and school, and where value and behavioral models are constructed outside of pedagogical oversight or ethical regulation.

In this context, the AI environment emerges as a hidden cultural actor, not merely supporting education or providing entertainment, but actively participating in the engineering of childhood. Through algorithmic strategies, AI works to mold perception and adapt behavior to pre-coded patterns of consumerism and individualism. This is evident in the growing reliance on auto-customized content and the decline in direct human interaction, alongside the increasing role of smart media in shaping emotions, organizing preferences, and determining what should be learned or liked.

The severity of this interaction becomes more apparent when we consider that children lack the cognitive and critical immunity necessary to distinguish between educational tools and directive systems (Djamel, Ghembaza & Brikel, Hachemi, 2024). The algorithms powering these applications are not neutral—they are built on market logic, behavioral analytics, and influence strategies. As a result, new forms of hidden behavioral addiction emerge, in which children's emotions, moods, and attention are reshaped within closed loops of repetition and reward.

On the other hand, the value system of childhood is being reconstructed through these digital ecosystems, where applications, games, and smart assistants transmit standardized patterns of thinking and behavior. These patterns are promoted indirectly and often conform to politicized cultural and economic norms. Thus, the child appears to be learning and interacting freely, while in reality, they are being reprogrammed within a directed digital environment that imposes preconfigured models of success, happiness, and social acceptance.

From this standpoint, the present study aims to analyze the complex relationship between childhood and artificial intelligence through three interrelated dimensions:

- **The impact of AI on children's cognitive development**, focusing on adaptive learning mechanisms, algorithmic personalization, and accelerated perception—often at the expense of critical thinking and creativity freedom.
- **Hidden addiction** stemming from continuous interaction with smart media, shaped by design strategies rooted in instant reward and emotional stimulation, which lead to diminished attention spans and heightened dependency on immediate responses.
- **Value formation within the digital environment**, where value systems and behavioral norms are reproduced outside traditional socialization contexts. This raises critical questions about identity, belonging, and symbolic immunity in the age of algorithms.

This analysis is grounded in a critical sociological approach that views artificial intelligence not merely as a tool, but as a symbolic and economic structure that re-engineers life and exerts soft power over the most vulnerable group: children. Under this system, the child is no longer simply a learner, but a project being shaped within designed environments targeting behavior and consciousness. This process contributes to the reproduction of childhood not as a stage of free growth, but as a domain of epistemic and economic control. Hence, there is a pressing need for a critical deconstruction of these digital environments and the development of new models for conscious digital education (Khelifa, Mohamed & Brikel, Hachemi, 2025).

Artificial Intelligence and Children's Cognitive Development Between Accelerated Potential and the Conditioning of Intelligence in the Digital Environment

Cognitive development is one of the fundamental pillars in shaping a child’s personality and in forming their mental and emotional framework. It does not occur in isolation from the educational and social contexts in which the child lives, but rather emerges through complex interactions between genetic abilities, upbringing styles, the quality of human relationships, and the nature of the educational environment to which the child is exposed. What distinguishes contemporary childhood, however, is the transformation of the learning space from a tangible human environment into a smart algorithmic one, where knowledge content is reshaped through adaptive systems based on artificial intelligence.

Today, children learn and evolve through connected digital platforms that analyze their behavior and adjust the way content is presented according to their explicit or implicit preferences. Smart education, which relies on algorithms and machine learning, has become—on the surface—a viable alternative to traditional pedagogical models,

especially in contexts marked by overcrowded classrooms, a shortage of educational staff, or the desire to personalize learning pathways (Brikel, Hachemi, 2024).

Numerous studies (Papadakis et al., 2021) have shown that AI can contribute to accelerating cognitive skills and improving comprehension and analytical abilities in children, particularly those with intellectual disabilities or learning disorders, thanks to its ability to detect cognitive weaknesses and offer precisely tailored educational solutions. Moreover, this smart environment provides a personalized, flexible, and highly responsive learning experience that may surpass traditional models in certain aspects.

While risks of AI-related standardization and behavioral conditioning are real, a growing body of research emphasizes the transformative educational potential of AI. When applied thoughtfully, AI can enhance student engagement, personalize instruction, and support learners with special needs—contributing to more inclusive and adaptive learning environments. These benefits, however, require ethical oversight and pedagogical design to avoid reinforcing social inequalities or algorithmic bias.

Nevertheless, these technological transformations are not without structural and contextual concerns. Cognitive development is not achieved solely through the quantity of information or computational speed; it also requires an environment rich in creativity, human interaction, open-ended questioning, and sensory engagement with the world. Excessive reliance on artificial intelligence to shape knowledge may lead to what some describe as a "shrinkage of reflective consciousness," where intelligence is reproduced in pre-configured, measurable templates at the expense of exploratory thinking and critical creativity (Livingstone & Blum-Ross, 2020).

Furthermore, while AI technologies offer considerable cognitive advantages, these benefits are not experienced uniformly across all children. Factors such as socioeconomic status, access to stable internet, the quality of parental mediation, and the cultural relevance of content significantly influence the impact of smart education. Children from marginalized or under-resourced communities may face disproportionate risks of digital dependency or reduced critical engagement.

Importantly, this section, while conceptually grounded, lacks empirical data or field observations. No comparative studies are cited to demonstrate how children from diverse backgrounds experience AI-driven learning. Future research should incorporate mixed-method approaches—including classroom observation, interviews with educators and families, and performance tracking across digital and non-digital learning contexts—to validate the claims made here and explore how adaptive intelligence reshapes learning trajectories in real-life educational environments.

Artificial Intelligence: Between Hegemony and Empowerment

While this study highlights the symbolic domination and risks associated with artificial intelligence—particularly its role in reinforcing consumerist models and shaping value systems through algorithmic control—it is essential to acknowledge that AI is not inherently hegemonic. Rather, its impact on childhood is contingent upon the ethical, educational, and cultural frameworks within which it is deployed. In pedagogically guided environments, AI can become a transformative force that fosters individualized learning, enhances access to quality education, supports children with special needs, and stimulates creative expression. Moreover, when communities and educators retain agency over the design and implementation of AI tools, these technologies can serve as instruments of inclusion, critical awareness, and cultural preservation, rather than standardization or alienation. It is, therefore, reductive to frame AI solely as a source of symbolic violence. A more balanced perspective recognizes the dual nature of AI: both as a potential mechanism of control and as a medium for empowerment, depending on who controls it, for what purposes, and within which social context.

Moreover, the algorithmic design of these systems carries a hidden normative dimension, as educational pathways are programmed according to market priorities and efficiency standards, rather than the child's psychological needs or cultural background. Thus, knowledge becomes a "digital service" in which content is consumed in a pre-structured manner, leading to the development of a child who can respond intelligently, yet is deprived of tools for intellectual questioning.

What emerges here can be described as the "conditioning of child intelligence"—a process where cognitive potential is reshaped within closed digital frameworks that leave no room for divergence or creativity error. The algorithms managing these environments are not neutral; rather, they reflect specific cultural and ideological logics that reproduce a standardized model of childhood at the expense of diversity and personal experience.

Analytical studies suggest that excessive use of smart media can weaken creativity and experimental faculties, distort the perception of real time, and hinder social communication skills. A child who becomes accustomed to learning from fast-reacting digital interfaces may later find it difficult to cope with educational situations that require patience, dialogue, or reflection.

In this light, the impact of artificial intelligence on children's cognitive development cannot be understood without a critical perspective on the automated learning systems that govern these environments. We are witnessing the emergence of a new form of childhood, one shaped by the logic of digital productivity and evaluated based on its

compliance with smart models—rather than its capacity for independent thought or free expression.

Hidden Addiction: When Artificial Intelligence Becomes a Tool for Distorting Children's Perception

Amid the rising promises surrounding the use of artificial intelligence in education and entertainment, a new behavioral issue is emerging—what can be described as *hidden addiction*. This addiction doesn't always appear as direct attachment, but rather as a gradual reconfiguration of the child's relationship with digital devices and the world perceived through them. Children's smart applications are not designed neutrally; they rely heavily on models derived from behavioral psychology—instant rewards, repetitive visual and auditory stimuli, and progressive tasks—forming what has come to be known as *digital behavioral engineering* (Zuboff, 2019).

Although these models appear educational or entertaining on the surface, they restructure the child's brain around a new center: the *instant stimulus*. Over time, this weakens capacities for patience, sustained attention, and interest in human or physical interaction. Psychological studies show that overexposure to smart media leads to cumulative disorders, including anxiety, mental distraction, compulsive attachment to digital content, and progressive disconnection from familial and social environments (Twenge & Campbell, 2018).

The danger of this addiction lies in its *invisibility*. It doesn't begin with shocking symptoms or deviant behavior but infiltrates emotions and awareness through subtle pathways. Emotions and internal motivations are reshaped via seductive, exciting digital designs that conceal a logic of repetition, consumption, and instant responsiveness. Educational games, for example, are presented as tools to enhance intelligence, but at their core, they are programmed to foster attachment, habituation, and constant responsiveness to digital rewards (Brikel & Hachemi, 2010).

From a sociological perspective, this type of interaction can be understood as a form of *soft symbolic domination*—a power that does not exert coercion but rather normalizes the child's behavior gradually through pre-designed digital content. This content delivers behavioral and value models without granting the child space for critical thinking or questioning. The child may appear to interact freely, but in reality, they are being reshaped within a closed digital environment that dictates how they think, react, and even play.

Reports in digital psychology have linked this type of addiction with:

- Decline in reflective abilities;
- Weakening of real-life social relationships;

- Emotional detachment from close surroundings;
- Erosion of creativity faculties;
- Growing reliance on external stimulation for joy and emotional arousal.

The issue of hidden addiction is not limited to screen time—it lies in *how* the interaction unfolds and the design logic behind smart applications. The danger isn't merely spending three or four hours in front of a device, but whether the device encourages critical thinking or reinforces automatic reactions; whether it opens spaces for dialogue or instills pre-programmed patterns of desire and interaction.

Superficial policy responses, like merely regulating "screen time," are insufficient. What is needed is a comprehensive deconstruction of the addiction ecosystem—from market logic to content design and the absence of rich cultural alternatives. The responsibility does not fall solely on the child, but on the educational, media, and legislative systems that allow highly engaging apps to be marketed without educational oversight or behavioral regulation.

Building resilience to this addiction requires:

- Offering alternative educational and entertainment content that fosters imagination, reflection, and human interaction;
- Training children in *conscious disconnection* from devices;
- Integrating media education and digital criticism into school curricula;
- Strengthening social institutions such as families and schools to confront the expansion of digital mediation.

From Cultural Socialization to Algorithmic Programming

In traditional educational systems, values were acquired through daily interactions with primary socialization institutions: the family, school, neighborhood, and local community. Morality was transmitted through storytelling, daily behavior, and living examples. In the digital age, however, the value system has been transformed into a closed algorithmic structure that reprograms children's behavior and value perceptions indirectly—yet deeply and effectively.

Today's child does not absorb values solely through folktales or school texts but engages with intelligent environments embedded with invisible symbolic patterns transmitted via digital games, short videos, smart assistant apps, and virtual characters. The risk lies not in the visible content, but in the *interactive structure* of that content—what is rewarded and what is ignored, what is repeated and what is excluded. This structure generates a hidden model of socialization that no longer reflects local cultural or educational specificities but instead reconfigures values according to the logic of the digital marketplace (Nieborg & Poell, 2018).

This logic suggests that the child is trained not on ethical principles, but on how to respond to what captures attention and what is algorithmically classified as "preferred," in the absence of critical discussion or real-life experiences. Values are thus implanted indirectly, and behavior becomes a product of programmed interactions that simulate consumption, competition, individualism, and symbolic superficiality.

In this context, algorithms do more than present content—they reshape preferences themselves, within what researchers term a *"value bubble"* (Coeckelbergh, 2020), where children are only exposed to what reinforces their current beliefs and confirms them, thereby weakening critical thinking, the capacity for accepting difference, and openness to cultural and value diversity.

This process goes beyond individual choice and involves deeper dimensions such as:

- Constructing a global normative model of the digital child;
- Excluding non-dominant cultural patterns;
- Normalizing commercial values within play and learning spaces.

From a sociological analytical perspective, this shift from *socialization* to *algorithmic programming* represents a transformation in educational authority. The family and school are no longer the primary guides; instead, digital platforms have become the main educators and sources of symbolic and behavioral models. Children today learn more from virtual characters than from teachers, and are more influenced by the responses of digital assistants than by parental advice (Brikel, H., & Thliji, O., 2023).

The danger in this transformation lies in the lack of educational awareness among many schools and families, which perceive these media as merely "assistive tools," while in fact, they are deeply reshaping children's taste, judgment, and moral conscience. Algorithms do not merely transmit knowledge—they smuggle in hidden representations of success, beauty, superiority, and the "other."

Addressing this covert value shaping cannot be reduced to mere calls for caution or parental monitoring; it requires a profound reassessment of the very concept of education in the digital age. What is needed is the development of what could be called *"digital value immunity"*—empowering children with critical tools to distinguish between content and *directed* content, between genuine values and those cloaked in technological neutrality.

This responsibility lies with families, schools, and cultural institutions, through:

- Strengthening critical dialogues with children about digital content;
- Integrating media and value education into school curricula;
- Developing smart applications that respect local cultural contexts and offer non-stereotypical models of success, excellence, and happiness.

In the age of artificial intelligence, children do not merely need *technical protection*, but a *symbolic compass* that restores their right to reflect, critique, and choose freely. The danger is no longer just in *what* children learn—but in *who decides* what they should learn, and *why*. If we fail to rebuild a conscious value environment, we risk raising generations that reproduce digital obedience and algorithmic conformity, rather than free, diverse, and critically aware human beings.

Conclusion

This study has argued that childhood in the age of artificial intelligence is undergoing a profound transformation—from being shaped primarily within familial and educational institutions to being increasingly molded by algorithmic systems. These digital environments not only monitor children's movements and preferences, but also propose behavioral patterns, linguistic codes, and value systems that influence identity formation from an early age.

While artificial intelligence holds potential for personalized learning and cognitive support, particularly in under-resourced educational contexts, its growing presence also raises concerns about the standardization of imagination, the programming of desires, and the emergence of behavior shaped more by algorithms than by human interaction. The child's world is now co-constructed by invisible data flows and predictive analytics that often reflect market-driven logic rather than pedagogical or ethical considerations.

In socially and environmentally fragile contexts—such as those marked by forced migration, poverty, or cultural displacement—the risks are magnified. Digital technologies can replace storytelling, emotional warmth, and cultural continuity with fast-paced, consumer-oriented content. This dynamic may erode symbolic resilience and contribute to identity dislocation.

Yet, these outcomes are not universal nor inevitable. The impact of AI on childhood varies across regions, cultures, social classes, and degrees of digital access. Therefore, it is crucial to approach AI not as a monolithic force, but as a socially embedded technology that must be critically examined and ethically guided. Rather than declaring childhood a battleground, we must engage it as a complex and contested space—one that demands renewed pedagogical, ethical, and cultural strategies to preserve the richness of human development in the digital age.

Recommendations:

- **Develop comprehensive digital educational policies** that integrate artificial intelligence into learning environments through a critical lens—balancing automated interaction with human connection, and enforcing oversight over educational algorithms.

- **Produce culturally grounded smart content** inspired by the linguistic and cultural specificities of Arab and African children, offering it as an interactive educational alternative that protects identity and ensures equitable cultural representation.
- **Integrate digital and media literacy** into curricula from early childhood, strengthening critical awareness and enabling children to deconstruct digital content rather than blindly follow it.
- **Train educators and parents** to understand the psychological structure of digital addiction and to adopt conscious engagement strategies with smart applications, rather than relying solely on restriction or prohibition.
- **Support sociological and psychological research** on the impact of AI on childhood in vulnerable settings, facilitating the production of independent critical knowledge outside Western epistemologies.
- **Establish regional ethical oversight bodies** to evaluate AI tools used with children, ensuring a balance between educational benefits and psychological safety.
- **Develop the concept of "conscious digital citizenship"** as a foundational educational approach to nurture a child who uses technology from a position of agency, not dependency—aware of the boundaries between digital freedom and covert algorithmic control.

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