

Discovering new paths: an experience of appropriating digital technologies in Early Childhood Education cultural contents

Descobrendo novos caminhos: uma experiência de apropriação das tecnologias digitais na Educação Infantil

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ABSTRACT

This article aims to reflect on the possibilities of appropriating technologies with children in Early Childhood Education. The study is characterized by a qualitative approach in the exploratory modality based on the studies of Historical-Cultural Theory. The study was conducted in the context of ongoing teacher training in the use of digital technologies. The data were collected through observations and document analysis, involving two Early Childhood Education teachers and six pedagogy undergraduate students in training at the schools, as well as two classes of children aged 4 and 5 from two Municipal Early Childhood Education Centers. The results show that digital technologies, when appropriated intentionally, can go beyond entertainment and promote active interaction between children and cultural content.

Keywords: Early Childhood Education. Digital Technologies; Appropriation.

RESUMO

Este artigo tem como objetivo produzir reflexões acerca das possibilidades de apropriação de tecnologias com crianças da Educação Infantil. O estudo caracteriza-se por uma abordagem qualitativa na modalidade exploratória, fundamentado nos estudos da Teoria Histórico-Cultural. O estudo se deu a partir do contexto de uma formação continuada de professores para uso das Tecnologias Digitais. Os dados foram coletados por meio de observações e análise documental, envolvendo duas professoras da Educação Infantil e seis estudantes de licenciatura em Pedagogia, em atuação formativa nas escolas, além de duas turmas de crianças de 4 e 5 anos de idade, provenientes de dois Centros Municipais de Educação Infantil. Os resultados evidenciam que as tecnologias digitais, quando apropriadas de forma intencional, podem ir além do entretenimento, promovendo uma interação ativa das crianças com os conteúdos culturais.

Palavras-chave: Educação Infantil. Tecnologias Digitais. Apropriação.

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1 Introduction

You can't use a tape measure, scales, barometers, or
anything else to measure how important something is.
We must measure the importance of something by how
much it enchants us.
On importance - Manoel de Barros (1997)

Manoel de Barros's poem makes us think about how we should judge the value and importance of things in life, it says that the true value of something is the sense of wonder it gives us. This viewpoint makes us realize that not everything can or should be measured objectively. Some of the most important things that happen in life can't be put into numbers or metrics. So, the poem puts human experience at the center of what it values.

With this in mind, the study talks about how important human experience is in Early Childhood Education (ECE). In this context, when we talk about experiences, we mean any kind of experience that is truly humanizing and makes children need things, like access to culture in its most refined forms (Mello, 2015).

Mello (2019, p. 95) posits that the process of humanization arises from the appropriation of human qualities, as elucidated by Historical-Cultural Theory (HCT), this movement transpires through the activities that the child engages in with both individuals and cultural artifacts, including language, art, cognitive frameworks, habits, customs, values, scientific knowledge, techniques, objects, and tools. As children learn how to use these tools, they go through a process of internalizing the skills that come with them. In light of this, the significance of the content that educators deliver to children is underscored, as the absence of more sophisticated cultural forms precludes the full realization of the child's developmental potential (Pasqualini, 2015).

Digital Technologies (DT)⁵ are everywhere in our society. However, there are many problems with using them in schools, such as not having enough infrastructure and needing to train teachers to use them in a way that is appropriate for the age of the children. In early childhood education, these problems are even more obvious because of how this age group is different. Some schools use technology to make mechanical and decontextualized tasks more difficult, which doesn't help kids learn or grow much.

On the other hand, we believe that social interaction and access to the most complex forms of culture are important for the growth of children. In this regard, DT, as a cultural instrument, also engages in this process. But bringing them in requires carefully planned actions that help people understand the world and cultural appropriation better.

In this context, the central question of this investigation is: how do digital technologies, as cultural artifacts, facilitate the process of cultural appropriation among children in Early Childhood Education? To address this inquiry, our primary aim is to contemplate the potential applications of technology in Early Childhood Education as a component of the humanization process.

To examine this problem, we focus on two cohorts of children aged four and five attending two Municipal Early Childhood Education Centers (CMEI). During the academic year in 2023, the lead teachers at these schools took part in keeping doing education that focused on how to use DT.

In the first part of the text, we talk about the Historical-Cultural Theory and how people use culture and digital technologies. In the second part, we talk about how we did the study. Finally, we talk about and look at the data we got. In

⁵ We start with the idea that technology is a collection of knowledge, skills, tools, and techniques that people have made to solve problems, improve their abilities, or change the world around them. This includes things like books, phones, and pens that people use to talk to each other, as well as the ways we interact with the world (SANCHO, 2001). Digital technologies can be defined as a collection of resources, languages, and practices facilitated by digital devices and environments that allow for the creation, sharing, storage, and transformation of information in various formats. They are more than just technical tools; they are cultural things that change how people think, act, talk, and learn, as well as how they interact with others and learn in school (LÉVY, 1999; KENSKI, 2012).

the final remarks, we review the study's contributions and suggest potential implications for pedagogical practices.

2 The Historical-Cultural Theory and Human Development: Appropriation of Culture and Digital Technologies

According to the Historical-Cultural Theory (HCT), the sociocultural development of a person is an important historical process that has to do with how people use cultural products. In this context, education in schools is very important for promoting a type of learning that helps the mind develop to its fullest (Duarte, 2000; Martins, 2013).

The Historical-Cultural Theory posits that social relations—specifically, the interactions and norms established within a society—are internalized by the individual. This means that what happens outside of the person, in interactions with other people, is taken in and changed into internal processes that make up the person's psychology and behavior. Consequently, our cognition, behavior, and consciousness are fundamentally shaped by the tangible and social actions that constitute our existence.

The evolution of Historical-Cultural Theory is fundamentally connected to the understanding of Man, Society, and Culture. Human accomplishments are intrinsically linked to labor, facilitated by the appropriation of culture, which subsequently fosters dependence on its own production.

Understanding society as the material and symbolic objectification of social labor, shaped by historical social relations of production, it recognizes the interconnectedness and interdependence between the subject and society, as well as between the subject and object, viewing them as fundamental components for the development of both (MARTINS, 2016, p. 103–104).

This idea emphasizes a close connection between subject and society, recognizing that both are mutually constituted through social relations and production processes throughout history. By viewing society as the material and symbolic manifestation of human labor, it is underlined that the advancement of

higher cognitive processes, such as contemplation and consciousness, occur not in isolation within the individual, but rather as a reflection of social practices and interactions within a particular historical framework. Consequently, the interdependence between subject and object emerges as a fundamental principle for understanding human development, as the subject not only adapts to the social environment but also transforms it through conscious activity, which, in turn, shapes the subject itself (MARTINS, 2016).

The same author stresses that work always involves pre-ideation, which means thinking about the product before starting it. This means that work requires certain mental skills, like being able to picture the reality you want to change in your mind. The author notes that Vygotsky sees social labor as the event that marked the end of the natural history of animals and the beginning of the social history of humans.

The author continues her analysis of Vygotsky's work, stressing that signs are extra tools that help solve psychological problems. Signs, like physical tools, require people to change the way they think and act in order to be useful. Signs are also helpful tools for solving psychological problems. Just like physical tools need people to change how they act and think to work properly, signs also need people to change how they act and think.

Martins (2016, p. 106), drawing on Marx's historical-dialectical materialism, asserts that signs are not merely passive representations; they actively mediate our actions and thoughts. In this context, the author thinks that mediation is very important. This indicates that both signs and tools function as mediators, intervening in the relationship between the subject and the world, thereby affecting our cognition and behavior.

For historical-dialectical materialism, activity is a fundamental action, signifying that the evolution of society and individuals is interconnected with the tangible and pragmatic activities performed in the real world. Leontiev (2014, p. 160) said this:⁶

⁶ The basic answer to this question lies in acknowledging that these processes are those that realize a person's actual life in the objective world by which he is surrounded, his social being in all the richness and variety of its forms. In other words, these processes are his activity.

The basic answer to this question lies in acknowledging that these processes are those that realize a person's actual life in the objective world by which he is surrounded, his social being in all the richness and variety of its forms. In other words, these processes are his activity (Our translation).

When the subject interacts with the object, they change and shape their consciousness through these interactions. They don't just get stimuli; they also do things that change how they see the world. Libâneo (2004) asserts that human activity constitutes a socio-historical process wherein learning and development are defined by the appropriation of cultural artifacts and the internalization of external behaviors.

Davydov (1988) posits that human activity is a theoretical abstraction of all universal human practices. In other words, activity is how people work, talk to each other, and change the world around them. Historically, the initial form of activity entails collective labor; consequently, its social nature is manifested within the activity.

One of the first things this reflection present is how Digital Technologies (DT) could help kids in the appropriation of culture. We introduce with the premise that technologies are manifestations of human agency interacting with nature (MARX, 1987). Moreover, when discussing the idea of appropriation, we refer to Leontiev's (2001) work, which says that this is a process that is mostly shaped by human activity and teaching, and that it is very important for children's psychological development. Leontiev (2001) posits that activity serves as the focal point for cultural appropriation, conducted by needs and directed by objectives. The author views teaching as a developmental activity crucial for cultural appropriation and asserts that it must be intentional and structured to facilitate the individual's engagement with culture. This process is not passive; it is an active exchange of ideas and values between student and teacher, during which cultural knowledge is shared, talked about, and absorbed.

So, children need to use Digital Technologies (DT) in a way that helps them grow and learn. To achieve this, it is crucial to transcend a purely instrumental or

technical perspective on technologies, as well as their simplification to terms like “novelty,” “innovation,” or “trend.” When you use DT, you need to plan around that and make sure that their use fits with teaching methods and child development. The teacher's role is very important.

Martins (2013) emphasizes a fundamental triad: form, content, and recipient, which pertains to the methodologies of instruction, the subject matter, and the target audience. This focus on planning aims to foster the perception that technologies should not be viewed solely as "cool resources," but as integral components of learning and development. Without this kind of purpose, they could easily become just a way to have fun, which doesn't help kids learn about the culture they are a part of.

This way of thinking is different from ways of thinking that verify Digital Technologies (DT) as just extra tools for doing mechanical tasks, as isolated educational games or reinforcing content that is not relevant to the situation. The main thing that joint intentional planning apart is that it makes sure that technologies are used to keep in culture, not just as a way to help with traditional teaching. The teacher's role is to help these interactions happen by guiding the child's experience so they do not only use the tools but also understand what they mean and how to use them in social situations.

Regarding with that, the way that Early Childhood Education is organized must go beyond not only adding technology and it must create an environment with tools that let kids explore, experiment, and use digital resources in a critical and active way. Pasqualini (2015) asserts that lesson planning should make possible the child's engagement with more complex cultural forms, thereby increasing their developmental opportunities. Thus, pedagogical intentionality in the application of digital technology is a crucial element in ensuring that these tools genuinely facilitate the process of humanization, transforming into instruments for the mediation of knowledge rather than merely serving as sources of entertainment.

In terms of pedagogical organization, children should have access to a diverse array of experiences and learning opportunities that include the

fundamental elements of interaction and play. From this viewpoint, the child's interaction with technology must be meticulously strategized, as it is recognized that, in modern society, the pervasive and unregulated exposure to screens has yielded detrimental effects on their development.

Centrality must be assigned to the child, rather than to DT themselves, as technological tools, akin to any other resource, cannot independently facilitate the teaching and learning process, and the “other” is indispensable in these relationships (FERREIRA; DAL PIZZOL; MELLO, 2024, p. 2–3).

We believe that Early Childhood Education needs a planned and welcoming learning space that can help children grow in all areas. From this viewpoint, the teacher's role extends beyond recognizing the children's initial needs; they are also tasked with fostering an environment conducive to the emergence of new cognitive, emotional, and social demands within the educational process.

Additionally, it is essential to emphasize that our existence in a digitally saturated society has incited numerous discussions regarding children's utilization of technology within the educational environment. In this regard, while acknowledging research on children's excessive screen time, we assert that technologies can function as mediators of cognition. To achieve this objective, the teacher's efforts must be informed by a comprehensive understanding of the function of technologies as cultural artifacts that can facilitate humanization.

3 Metodology

This study is qualitative and exploratory. It is part of a larger project called "Ambiências Formativas com o uso de Tecnologias Digitais" (Formative Environments with the Use of Digital Technologies), which the Research Ethics Committee approved under opinions no. 5.968.649 and no. 6.328.262. The project was a continuing education program called "Tecnologias Digitais como mediadoras das práticas educativas" (Digital Technologies as Mediators of Educational

Practices) that lasted for 100 hours and took place from April to October 2023. There were four thematic stations in the training that were related to using and adapting DT in education. There were also monthly meetings via Google Meet and activities that could be done at any time.

Some teachers from Basic Education at seven public schools served as supervising mentors in the Pedagogical Residency Program (PRP). This article share and analyzes an experience that two of these teachers had with six undergraduate Pedagogy students who were residents of a state university in northern Paraná.

These two teachers collaborated at various Municipal Early Childhood Education Centers (CMEIs), where they attend classes of 4- and 5-year-olds with about 15 students each. The proposal examined in this study was formulated within the framework of the continuing education program, wherein teachers were encouraged to design and implement a didactic experience utilizing DT, informed by the discussions and formative guidelines reviewed. This stage lasted four weeks, to be exact. It is important to emphasize that the children were not research subjects, and no data collection or targeted observations were conducted with them; the investigative focus was exclusively on the actions and outputs of the teachers participating in the continuing education program. However, the children were essential to the pedagogical wisdom, as their curiosity, connections, and modes of participation influenced the teachers' practices, highlighting the importance of considering children's engagement as a driving force for teacher training initiatives.

After having a conversation with the teachers, residents, and kids, the main idea of the planning was decided to be "healthy eating." The two classes, which this article calls Class A and Class B, worked together to come up with the activities. The kids took part in a process of inquiry that included research, discussion groups, reading pictures, watching school meals, going to the CMEIs' gardens, talking to the person in charge of the meals, and picking food that was grown nearby. These actions gave the kids more options and made the content more like what they were used to. Based on these experiences,

digital tools like Google Earth and Google Maps were added, which made it possible to explore the CMEIs' locations and the paths between them. The kids also wrote letters in which they talked about how people ate at each school. This made the exchange among the groups more symbolic and meaningful.

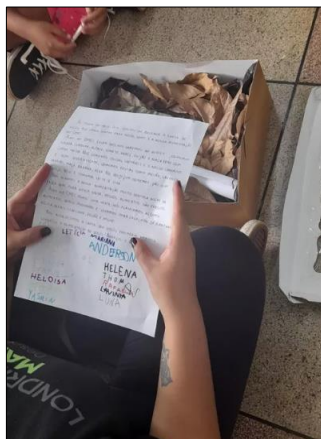
The data gathering was executed via the examination of lesson plans formulated by the educators and through responses from participants undertaken during the execution of the activities. The goal of the data analysis was to find groups of things that had to do with how DT was used in everyday teaching and how to encourage kids to have meaningful interactions with each other.

Results and Discussion

The following experience illustrates the proactive involvement of children in knowledge construction, emphasizing that learning occurs through relationships and purposeful engagement. We provide below an overview and evaluation of the main practices involved in the research to talk about these issues.

The research participants created a collaborative educational proposal centered on healthy eating, a theme anticipated for Early Childhood Education and incorporated in the Brazilian National Common Curricular Base (BNCC), specifically within the domain of Body, Gestures, and Movements, under the learning goal “Adopt self-care habits related to hygiene, nutrition, comfort, and appearance.” The proposal combined this material with children's books and the "letter" genre of writing. The activity involved two classes that sent each other letters about their eating habits at school, as we can see below:

Figure 1 – Letter from Class A to Class B.



Collection of the authors (2023)

Sticking with the texts, the kids made symbolic gifts out of things from nature, like leaves, seeds, and flowers. This made the experience feels like reality. The kids were expressly interested in the objects because they were emotional and curious when they gain them, as shown in the following conversation:

Student 1: “Pass it to me, I want to see the gift!”

Teacher: “Come on, children, pass the souvenirs we received so your classmates can see them.”

Student 2: “I can’t stop looking at it, these things are so beautiful.”

This emotional and intellectual involvement shows that the actions were not just made for the kids, but with them, respecting their interests and skills. Leontiev (2001) supports this view by making a distinction between activity and action. He stresses that action is always part of a larger activity that is driven by social factors. Human development is consequently influenced by cultural and historical factors that shape lived experiences.

Leontiev (2001) posits that human development transpires within a context, shaped by historical and social conditions. Consequently, these conditions influence the stages the individual experiences throughout their life during psychological development. This shows that the history and social context of each subject are very important in how they act.

The children experienced traditional writing models when they composed letters, inserted them into envelopes, and completed them with sender and

recipient details. This exposure allowed them to assimilate cultural content crucial for effective communication with others.

Miller and Mello (2008) emphasize the necessity of comprehending the entirety of the letter's communicative process, encompassing its function and the linguistic prerequisites essential for proficient writing. This means that you need to know what the letter genre is for and how it gets from sender to receiver, including things like how much it costs to send, but also need to know what writing skills are necessary for communication to happen effectively, which means that you need to learn some ideas that are related to this method.

When the students got the letters, they were very interested in finding out more about the kids, their teachers, the neighborhood where the CMEI was, and other things. To keep improving the experience and satisfy the kids' curiosity, the proposal started to focus on finding out where the institutions were in relation to each other. In this context, Horn (2017, p. 27) reiterates that “[...] the role of the teacher is to organize opportunities to support children’s experiences.” The investigation of the concept of location commenced with the use of a globe, which, despite not being a digital technology, serves as an educational instrument that facilitates the development of abstractions and aids children in comprehending spatial concepts such as belonging, scale, and location. After that, the conversation got bigger by using *Google Maps*, which showed the path between the institutions and the things that were around them, as shown in Figures 2 and 3.

Figure 2 – Observation – Address of the sender institution.



Figure 3 – Use of *Google Maps*.



Source: Collection of the authors (2023)

The images above clearly show how important it is to plan how technologies will be used in early childhood education in a way that meets human needs. The Historical-Cultural Theory posits that the child must assimilate “[...] what has been historically created by human beings, from spoken language to technological tools to the everyday trivial objects” (PASQUALINI, 2016, p. 48–49).

In this educational activity, we recognized the utilization of technologies as cultural tools integrated into children's daily experiences, facilitating their interaction with an area that, at that moment, was inaccessible in person.

Thoughts about the temporal and geographic processes that people are a part of our historical, coming from their desire to learn about the world and their ability to change it. People have always needed to understand the world in order to fully explore it.

Leontiev (2014) posits that the subject's activity is conceptualized as a connection between the object and the subject. He stresses that consciousness is not directly influenced by stimuli but is shaped by the subject's active engagement

with the environment. This subject does not merely receive stimuli but alters their interaction with the world through activity.

As part of the activity, the kids from Class B gave each other their home addresses so they could find them on Google Earth. This helped them understand their surroundings better. Oliveira, Mello, and Franco (2020, pp. 80–81) assert that “practices with technological advances should take into account the students’ daily lives in a society mediated by technologies.” The authors also stress how important it is to make sure that kids are not just consumers, but also holders of expertise that helps them understand a wide range of content related to the context of history, which lets them create things in school.

The kids used the search tool to see their addresses through the app, which shows a three-dimensional representation of the globe with the supervising guide and the residents helped them do this.

Figure 4 - Home address via Google Earth.



Fonte: Collection of the authors (2023)

Geographical knowledge relies on methodologies of observing, analyzing, and trial and error. Consequently, the advancement of the psychological aspect of sense is a crucial prerequisite for this process. The focus is not on the technological artifact itself, but on the socially mediated

actions that facilitate the acquisition of knowledge—such as identifying the addresses of homes, schools, neighborhoods, and other institutions—representing a form of environmental exploration that allows children to engage directly with the elements of their daily lives.

Anjos and Francisco (2021) assert that children cultivate their unique methods of engaging with technologies, illustrating autonomy and the proactive construction of knowledge. In this regard, it is insufficient to merely replicate content; it is imperative to provide children with tangible opportunities for interaction, creation, and contemplation of their surrounding environment.

Morais and Santos (2022) assert that knowledge does not arise from repetition but from mediated exposure to culture. Consequently, it is imperative that technologies be incorporated into deliberate pedagogical frameworks with a specified objective, facilitating children's comprehension of the social application of tools and thereby altering their interaction with the world. In this context, Moraes and Mello (2020) underscore that the utilization of specific artifacts can enhance the execution of cognitive tasks. But the focus shouldn't be on the artifact itself; it should be on the kinds of activities that are suggested. We comprehend that the utilization of Digital Technology in Early Childhood Education is fully actualized only when these tools are integrated with pedagogical practices that have explicit objectives, thereby elucidating the intended social applications for which they were granted.

This analysis allows deeply for a description of how the components of Martins's (2013) triad—form, content, and recipient—were focused on in the didactic experience. About "form," the selection of interactive activities, like using Google Maps and writing letters to each other, assisted kids gain the knowledge in a real way. In terms of "content," the experience not only instructed people about healthy eating, but it also show and taught them about space and geography. Finally, the planning deceived account the "receiver," which in this case was the child audience. It ensured that the activities were appropriate and meaningful to the kids in ages four to five.

The data examined in this study indicate that DT can be effectively integrated into the framework of Early Childhood Education, promoting children's cultural appropriation. The conducted experience demonstrated that the deliberate integration of technologies broadens the modalities of teacher mediation and improves interactions among children.

We examined the activities conducted through the lens of Historical-Cultural Theory, contemplating the potential integration of technologies in Early Childhood Education as an essential component of humanization and the advancement of higher psychological functions.

4 Final considerations

The observations and analyses of the experiences demonstrate that, when deliberately and thoughtfully incorporated into educational activities, Digital Technologies (DT) can enhance the human development of children. The experiences narrated illustrate that these technologies not only increase comprehension of the world but also promote curiosity, social engagement, and critical analysis. They can also assist people learn important skills like communication, teamwork, and problem-solving, which will help them understand and use cultural and technological forms in a significant way.

The findings indicate that the application of digital technology in Early Childhood Education transcends mere entertainment, promoting active engagement of children with cultural content. In this scenario, technologies must be regarded as components that alter, form, and set up the trajectories of individual transformation, like other cultural artifacts.

Considering the BNCC's guidelines, especially those for Computing, it is clear that there is a potential to improve teaching methods that, starting in Early Childhood Education, promote basic ideas about computational thought, innovative problem-solving, and the ethical and responsible use of technology. Consequently, the imminent research may examine the systematic, intentional, and contextual integration of these BNCC elements into didactic proposals,

investigating, for instance, the interplay between unplugged computing and children's literature.

This strengthens the case for the significance of structured and deliberate activities that can forge meaningful links between children's learning and life experiences, thereby fostering a more cohesive and contextualized educational experience.

Descubriendo nuevos caminos: una experiencia de apropiación de las tecnologías digitales en Educación Infantil contenidos culturales

RESUMEN

El objetivo de este artículo es producir reflexiones sobre las posibilidades de apropiación de las tecnologías con los niños en la Educación Infantil. El estudio se caracteriza por un abordaje cualitativo, exploratorio, basado en los estudios de la Teoría Histórico-Cultural. El estudio tuvo lugar en el contexto de la formación continua de los profesores en el uso de las tecnologías digitales. Los datos se recogieron a través de observaciones y análisis de documentos, con la participación de dos maestras de Educación Infantil y seis estudiantes de licenciatura en Pedagogía en formación en las escuelas, así como dos clases de niños de 4 y 5 años de dos Centros Municipales de Educación Infantil. Los resultados muestran que las tecnologías digitales, cuando son apropiadas intencionalmente, pueden ir más allá del entretenimiento, promoviendo la interacción activa entre los niños y los contenidos culturales.

Palabras clave: Educación infantil. Tecnologías digitales. Apropiación.

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