ENVIRONMENTAL EDUCATION: DISCOVERIES AND LEARNINGS WITH CHILDREN IN EARLY CHILDHOOD EDUCATION

EDUCAÇÃO AMBIENTAL: DESCOBERTAS E APRENDIZAGENS COM CRIANÇAS DA EDUCAÇÃO INFANTIL

EDUCACIÓN AMBIENTAL: DESCUBRIMIENTOS Y APRENDIZAJES CON NIÑOS DE LA EDUCACIÓN INFANTIL

Raquel Faria DIAS¹
e-mail: raquelfaria@ufu.br

Tatiani Rabelo Lapa SANTOS²
e-mail: tatiani.santos@ufu.br

Fernanda Duarte Araújo SILVA³
e-mail: fernandaduarte@ufu.br

How to reference this article:


| Submitted: 15/02/2023 |
| Revisions required: 28/03/2023 |
| Approved: 09/05/2023 |
| Published: 14/12/2023 |

¹ Federal University of Uberlândia (UFU), Uberlândia – MG – Brazil. Graduate in Pedagogy.
² Federal University of Uberlândia (UFU), Uberlândia – MG – Brazil. Professor at the College of Application (ESEBA). Doctorate in Education - Knowledge and Educational Practices Line (UFU).
³ Federal University of Uberlândia (UFU), Uberlândia – MG – Brazil. Professor at the Faculty of Education (FACED) and the Postgraduate Program in Education (PPGED). PhD in Education (UFU).
ABSTRACT: This article report results of a project carried out with a group of children from Early Childhood Education, from a federal public school in the city of Uberlândia, Minas Gerais. The activities carried out aimed at reflecting with the children on the environmental theme and aware about the importance of caring for the environment where they live. The theoretical-methodological framework was anchored in Historical-Cultural Psychology (HCP) and included participant observation as an instrument for data construction. In general terms, it was identified through the activities carried out that it is possible to work with the referred public from activities that enable investigation actions and discovery of natural phenomena for children to actively participate in the learning process.


RESUMO: O presente artigo resulta do projeto realizado com uma turma de crianças da Educação Infantil de uma escola da rede pública federal de ensino da cidade de Uberlândia, Minas Gerais. As atividades desenvolvidas objetivaram refletir com as crianças sobre a temática ambiental e conscientizá-las sobre a importância do cuidado com o meio onde vivem. O referencial teórico-metodológico ancorou-se na Psicologia Histórico-Cultural (PHC) e incluiu a observação participante como instrumento para a construção dos dados. Em linhas gerais, identificou-se, por meio das atividades realizadas, que se pode trabalhar com o referido público a partir de atividades voltadas a ações de investigação e descoberta de fenômenos naturais para elas participarem ativamente do processo de aprendizagem.


RESUMEN: Este artículo es el resultado de un proyecto realizado con un grupo de niños de una escuela pública federal de la ciudad de Uberlândia, Minas Gerais. Las actividades desarrolladas tuvieron como objetivo reflexionar con los niños sobre el tema ambiental y concientizarlos sobre la importancia de cuidar el medio ambiente donde viven. El marco teórico-metodológico se basó en la Psicología Histórico-Cultural (PHC) e incluyó la observación participante como instrumento para la construcción de datos. En términos generales, se identificó, a través de las actividades realizadas, que es posible trabajar con este público a partir de actividades dirigidas a acciones de investigación y descubrimiento de fenómenos naturales para que participen activamente en el proceso de aprendizaje.

Introduction

This article addresses the results of observations and reflections carried out from a project on environmental education developed with children from Early Childhood Education, aged five years, from a federal public school in the city of Uberlândia, state of Minas Gerais. The activities that make up this project are part of research carried out during the Supervised Internship discipline, of the Pedagogy course at the Federal University of Uberlândia. The central objective of the work carried out with the children was to build reflections on environmental issues, involve them and contribute to the process of raising awareness about the importance of caring for the environment, as well as experiencing possibilities of understanding and interacting with the environment where they live. Regarding the concept of Environmental Education that subsidized the project, it is highlighted that

Environmental Education requires completeness, a movement of diving into a complex reality, in which various types of knowledge are articulated and have the same importance: scientific, everyday, aesthetic and poetic knowledge. This dive – intentional, political – broadens the horizons of active knowledge (aimed at a world governed by the laws of physics), and leads us along the paths of contemplative knowledge (directed at a world of language, memory, history, affective interactions (TIRIBA, 2010, p. 11, our translation).

The theoretical-methodological framework was based on the approach of Historical-Cultural Psychology (PHC), a branch that is based on Historical-Dialetic Materialism (MHD). Regarding these options, we agree with Tuleski, Calvi and Santos (2021, p. 17, our translation), when they state that materialist dialectics, as a method of analyzing reality:

[...] it is an arduous and complex activity, which cannot be carried out by shortcuts or easy paths or answers, it is a constant effort to go back and forth from reality to thought and vice versa, overcoming by incorporation the phenomenal appearance and capturing as many relationships as possible at a given moment in the investigation.

Thus, we seek, through PHC and MHD, to understand objective reality, by considering its totality in movements and contradictions. We also privilege, in the studies developed by Vigotski (2008, 2018) and other PHC researchers, the importance of developing higher psychological functions, such as thinking, abstraction capacity, creativity, imagination, among others. Regarding the formation of typically human activities, Vigotski (2018) cites two types: reproductive, related to the ability to memorize based on lived experiences; and creative, developed through experiences and in which the individual is capable of re-elaborating and creating images and actions. Thus:
[...] the creative activity of the imagination depends directly on the richness and diversity of the person's previous experience because this experience constitutes the material with which the constructions of fantasy are created. The richer a person's experience, the more material is available for their imagination (VYGOTSKI, 2018, p. 24, our translation).

In this way, Vygotski contributes to the present discussion by explaining that we develop and learn through the interactions we establish with others in different cultural contexts, that is, our constitution and our development start from the social/cultural plane to the individual/personal and occurs in a socially mediated way.

In this way, we highlight the relevance of intentional, planned, and organized educational work, which aims to promote children's learning. We consider that understanding children in their sociocultural context requires recognizing them as “historical subjects with rights who, in the interactions, relationships and daily practices they experience [...] construct meanings about nature and society, producing culture.” (BRASIL, 2010, p. 12, our translation). We therefore understand, as stated in the Early Childhood Education Curricular Guidelines, published in 2010, that based on interactions and experiences built in society and shared with peers, the child develops, (trans)forms and becomes a subject.

Therefore, in this work, we value interactions and social experiences in the process of humanizing individuals. We consider that, from an early age, children are capable of developing criticality and feeling integrated into the different contexts in which they are inserted. Thus, the topic addressed was developed through active listening to the target audience to discover what knowledge they had and what they would like to learn about the environment.

To achieve the proposed objective, we opted for qualitative research, with participant observation in the daily life of the “rainbow class”, named in this way for ethical reasons and which includes children from Early Childhood Education at a federal public school. Regarding participant observation, it was chosen because it is a strategy that facilitates “the collection and interpretation of the data collected. It occurs more easily after being accepted by the group studied and the researcher who adopts this profile generally uses varied and specific ways of collecting data” (AZEVEDO; BETTI, 2014, p. 297, our translation), such as field records, photographs and filming. We understand that this methodological option helped those involved in daily life with the children to understand the culture in which they were inserted, to identify what they would actually like to learn.
Research development

The activities were carried out in a federal public school in Uberlândia/MG. The rainbow class had 15 children from Early Childhood Education, aged five years, where participant observation took place twice a week from March to December 2022. Regarding this methodological option, Proença (2007, p. 9, our translation) considers that:

[...] in participant observation the researcher personally experiences the event of his analysis to better understand it, perceiving and acting diligently in accordance with his interpretations of that world; participates in social relations and seeks to understand actions in the context of the observed situation. People act and give meaning to their world by appropriating meanings from their own environment. Thus, in participant observation the researcher must become part of such a universe to better understand the actions of those who occupy and produce cultures, grasp their symbolic aspects, which include customs and language.

In this way, we established a partnership between the researchers and the class teacher to build work proposals based on daily dialogues with the professionals involved in this context and the children.

According to the analysis of the pedagogical project of the researched institution, we noticed an anchoring of the pedagogical work in the assumptions of Historical-Cultural Psychology (PHC). As mentioned in the previous section of this text, this perspective considers the subject to be a social, cultural and historical being, in which personality is constituted by dialectical, material, psychic, social and individual aspects. Thus, we constitute ourselves as human beings in our multiple interactions with others and in the process of cultural appropriation.

When we understand children from this perspective, teaching methodologies must dialogue with this idea, in which children's learning processes need to occur through sociocultural experiences. In the meantime, the researched institution chose to organize pedagogical work through Project Pedagogy, in which methodological proposals cover children's prior knowledge and significant procedural activities are carried out that value everyday experiences and guarantee access to scientific knowledge.

Katz (1994, p. 1, our translation) presents the following definition for Project Pedagogy:

[...] an in-depth investigation of a subject worth learning about. The investigation is generally carried out by a small group of children in a classroom, sometimes by the entire class, and occasionally by just one child. The main characteristic of a project is that it is a research effort deliberately focused on finding answers to questions raised by children.
Therefore, the methodological proposal covers children's doubts and questions about the world, which makes it possible to build investigative work. Among the advantages of this methodology are:

[... contact with real social practices and allow the establishment of multiple relationships, expanding the knowledge of teachers and children on a specific subject. The work stages must be planned and negotiated with the children so that they can participate and follow the journey from the beginning to the end. Projects require cooperation, interest, curiosity, development of strategies for their execution and different types of records (CORSINO, 2009, p. 113, our translation).

Regarding the role of the teacher in Project Pedagogy, Corsino (2009, p. 114, our translation) highlights that:

The teacher is responsible for mediating each stage through the organization of proposals, questioning, research in different sources, observation, reflection, flexibility and knowledge of the content and skills that must be worked on. The duration of a project is variable, due to its great degree of unpredictability, and can be changed when necessary.

In this perspective, school is seen as a privileged environment for plural, inventive development and rich in possibilities, which promotes the construction of knowledge and exchanges between peers, as well as affective experiences and games; therefore, playing must receive special attention in the educational process. According to studies developed by Vygotski (2008, 2018), we argue that, through playing, children appropriate cultural modes and gestures historically produced by society, by mobilizing changes in psychic processes and reorganizing the psychological characteristics of the personality. Through play, it is possible to expand social interactions and understand human relationships, as well as their functions through role-playing games that involve a creative and imaginative nature. For this reason, the project aimed to develop proposals for activities to include play in its various possibilities.

The class plans were created, weekly, by the teacher who works with the group of children and the organization of the activities considered the characteristics of the class and the subjects of interest to them, presented during the conversation circles, in the moments of play and during the course of the day carrying out other activities. We understand that planning must be (re)elaborated on a daily basis and with the participation of the target audience, since daily planning needs to be managed in line with situations and experiences from the previous day, as well as the balance of planned activities and/or carried out at that time (PASQUALINI; TSUHAKO, 2016).
The organization of pedagogical work is flexible and aims to contemplate playful and collective experiences, at the same time as it has an intentionality that corroborates the thoughts of Vasconcellos (2002, p. 41, our translation): “planning is political, it is time to make decisions, to rescue the principles that underpin pedagogical practice. But to achieve this, you have to attribute value to it, believe in it, feel that planning makes sense, that it is necessary.”

Through observation and participation in daily school life, we list some actions developed in this context. It should be noted that they were carried out with a careful look and attentive listening, valuing the interests of the children.

Casa das Minhocas Project: experiences with children

By participating in the daily life of the researched institution, we intended to discover what the children knew and what they would like to learn in this context. In the same way, when we observe how organic waste was discarded by the class at school - together with the enthusiasm shown in experiences with the institution's green spaces and when we consider that, from a very young age, children are capable of developing criticality and integrate into the environments in which they operate –, we understand the importance of contemplating routine issues that problematize the impacts of human existence and consumption on the environment.

Through observation during the first month of carrying out the research, the theme of Environmental Education was chosen to implement a work project. So, the practice of composting would correspond to the axis of the other activities that would be built with the children.

In order to awaken reflections in children regarding the disposal of organic waste, we propose the assembly of a vermicompost bin, which consists of a biological process of valuing organic matter through the action of earthworms. This action is enhanced by the presence of worms, which contribute to greater speed, compared to composting without worms, in which humus is produced as a substrate. The latter is a fertilizer rich in nutrients and great for plants, in which we follow the composting process with them, in addition to promoting investigations and contributing to the development of hypotheses about the reuse of organic waste.

Actions were planned according to the interests and demands of the children, as well as the experiences arising from monitoring the composting process. Furthermore, we were able to work on other subjects in a meaningful way, approaching different textual genres such as instruction manuals, letters, messages, among others.
It is important to highlight that the proposals presented in this subitem are the result of research actions, planned by the researcher and discussed with the teacher who works at the school. We emphasize that, although they are specific actions of the investigation carried out, they were linked to the development of the daily proposals that make up the Teaching Year's Didactic Project.

Regarding the role of the different subjects participating in the research, we emphasize that the researcher, based on observations made in the school space, read about the topic discussed with the children, sought materials and books on the subject discussed, participated in teaching planning and developed the proposed activities with the students.

The teacher who works in the class participated in the action planning process, mediated the proposals made with the group and carried out continuous dialogues with the researcher, in order to reflect on what was being done and the importance of recognizing the child as the center of planning of Early Childhood Education, valuing teaching-learning processes that are appropriate and coherent with children's education, in a reflective, open and respectful manner.

After carrying out the actions with the children, the researcher and the teacher responsible for the class met to reflect on the students' participation and interaction with the proposal developed. These moments were important and significant, as it was possible to evaluate how the activities developed reverberated in the children's daily school life, which was necessary to adapt based on the experiences promoted with the group and also served to plan new proposals, based on the demands that arose in the class.

Given the above, below we present the practical actions developed in the school context. To expose the topic to children and awaken them to earthworms and what is ingested by these worms, we read the book “Worms eat peanuts” (GÉHIN, 2013) (Figure 1) in the institution's external environment. At the end of the dynamic, we asked if they knew what the worms liked to eat and where they lived; Therefore, we started searching for earthworms to see if we could find them at the school.
After reading the book and exploring the school's external space, we discussed Environmental Education with the children who, in turn, were invited to record what they knew about the subject and how they imagined a “worm house”. In Figure 2, we visualize their production and their hypotheses regarding the topic presented:

Figure 2 – Children’s production of what a worm house would be like

Source: Authors’ personal archive (2022)

Through drawings and sensitive listening, we noticed that the children were attentive to the conversation about reusing food, as some drew fruits next to the worms and represented a house intended for these worms. The proposal developed with the class provided moments of interaction, as it was a playful practice that enabled different learning in relation to knowledge that is part of life. In this case, we were able to experience a “dynamic, lively, “playable”,

Figure 1 – Cover of the book “Minhocas comem amendoins”, by Élisa Géhin

Source: All about book website⁴

explorable, transformable and accessible children’s play space for everyone” (BRASIL, 2006, p. 8, our translation).

After the first action developed with the children, we carried out, together with them and the class teacher, an interview with the professional who works in the canteen to discuss aspects related to the use of organic waste from the school and requested a report on the types of organic materials from the snack that were discarded and their respective destinations, since, in the cafeteria, there is a container to collect them. After interviewing this professional and discussing with the children about reusing peels and food scraps, we agreed with her that, every week, especially on Wednesdays, we would save the rest of some food consumed at school to feed the worms. This proposal generated enthusiasm among children, especially with the arrival of the earthworms in May 2022.

After this period, we received a pedagogical compost bin assembled collectively by the class in the room (Figure 3). At that moment, the children were able to pick up the worms, get to know and feel the humus, as well as understand how to assemble such a container with digester boxes:

**Figure 3 – Compost bin assembled by children**

Source: Authors’ personal archive (2022)

With the arrival of the worms, actions related to the subject were developed, such as games in the classroom and the construction of a fictitious worm house using toys (building blocks).

After that, children from another class at the school were curious about the progress of the project on the compost bin and sent a letter to ask about the activities and discoveries. Thus,
the rainbow class also prepared a letter for their friends, with the help of the teacher and researcher, and delivered it personally (Figure 4). In this context, they were able to talk about what they had learned about worms and the compost bin, as well as getting in touch with the letter genre.

Figure 4 – Response letter written for the 2nd period class A

![Response letter written for the 2nd period class A](image)

Source: Authors’ personal archive (2022)

The written record of the letter was made by the researcher who, in turn, listened carefully to the children's expressions and encouraged them to participate in the activity and to take a position on the issue.

Upon arrival of the compost bin, we carry out actions relating to the care and maintenance of the equipment. Every week, we dedicated time to introducing new organic materials into the compost bin, for the children to contribute to this care. Furthermore, we observed the composting process and the appearance of fungi, mites and humidity.

Regarding feeding the worms, we spoke to the children and presented a manual on the foods considered suitable for them, which was posted near the compost bin – when necessary,
we followed the guidelines presented there for carrying out care. We also organized a container in the refrigerator in the teachers' room, for the children to collect food scraps on other days, as they also began to separate the rest of the fruits to contribute to the composting process. As it is something unusual to store in a refrigerator, we decided to put together a message to inform other professionals at the school about the purpose of the jar and guide them so as not to discard it (Figure 5):

**Figure 5** – Note created with the children to post on the refrigerator door

![Figure 5 - Note created with the children to post on the refrigerator door](image)

Source: Authors’ personal archive (2022)

The children and professionals who worked in other Early Childhood Education and Elementary School groups visited our classroom and became interested in the subject – at this juncture, the rainbow group felt happy to share what they learned with the development of the project. Thus, we build meaningful learning with students, based on an ethical, aesthetic, humanized, playful way of educating that values nature and the environment where they live.

As time went by, some children questioned the worms' lack of names, since all the objects in the room had been named. Thus, we took a vote to choose names for the worms in the compost bin and, after recording the names mentioned by the class on the board, the children tried to name the worms on separate activity sheets (Figure 6).
Significantly, we developed several actions related to the environment for children, still in Early Childhood Education, to understand the existence of ways to reuse and dispose of waste more appropriately, take care of nature and animals, in addition to carrying out important actions related to them on a daily basis to the place where they live.

During the project, the children experienced unique moments such as exploring the school's external environment, in which there were new discoveries and significant contact with nature; reading and telling stories related to the theme; appropriate care and food for earthworms; working with different textual genres (letter, note and manual); understanding farm animals; tasting the children's favorite fruits, among other activities.

According to Barbosa (2013, p. 56, our translation), after carrying out the project development, children need to expose, retell and narrate what they learned through different languages, since the “evaluation of the work developed is done based on the reunion with the problem situation initially raised and with the comments made on what was proposed and what was carried out”. In this way, at the end of the project, we organize an exhibition with the children's creations, as well as the products produced in the compost bin, such as humus and biofertilizer liquid, in which each one can physically take the project with them and use the materials in their homes.

Thus, the school community – family members, professionals and other children at the institution – got to know the work through the exhibition and dialogue with the rainbow class. We understand that the actions developed with the class were significant, due to the way in which the children participated, got involved and showed interest in the proposed actions.
Given the observations and propositions made with children, we understand that the “challenge of an Environmental Education project is to encourage people to recognize themselves as capable of taking action” (MEIRELLES; SANTOS, 2005, p. 35, our translation). In this aspect, we believe that it was possible to carry out, in a playful and contextualized way, work to raise awareness and build learning with those involved in the project.

**Final remarks**

The development of this work it favored reflections on the environment and nature for children and professionals who work in the researched institution. We understand, therefore, the importance of children participating effectively in the teaching and learning process in everyday school life, based on speeches, looks, questions and notes that helped in the promotion and development of pedagogical practices that are more appropriate and coherent for the development of this public.

When we consider the theme of environmental education as an educational proposal and based on the relationship with nature, we see the construction of a field of interactions with society and cultures. In this sense, we approach the complexity of the subject through procedural, reflective and critical learning, so that children understand their presence in the world and rethink their interaction with nature. For this, the learning process was considered a dialogical act, in line with the prior knowledge, interests, and curiosities brought by the students during classes.

Experiencing the complex elaboration of a project with the theme of environmental education was a great challenge, as deep-rooted and mistaken ideas are perpetuated in which we are not always aware of our contradictions. However, if there is a desire for change, we must recognize the flaws to correct them *a priori* and, *a posteriori*, understand that we are in a constant process of (trans)formation.

Finally, we must build, with public school children, humanizing work proposals that enable access to arts and science and are consistent with the principles defended for the necessary social transformation.
REFERENCES


CRediT Author Statement
Acknowledgments: Not applicable.
Financing: Not applicable.
Conflicts of interest: There are no conflicts of interest.
Ethical approval: The research respected ethics throughout its development. All individuals who participated in the research signed a Term of Commitment that is with the authors of the text.
Availability of data and material: Not applicable.
Author contributions: Raquel Faria Dias: Responsible for planning, developing the activities presented and writing the article. Tatiani Rabelo Lapa Santos: Leading teacher of the room in which the work presented was developed. Contributed to the planning, execution of the activities presented and writing the article. Fernanda Duarte Araújo Silva: Professor guiding the work. Contributed to writing the article.

Processing and editing: Editora Ibero-Americana de Educação.
Review, formatting, standardization, and translation.