



EACH - Early Childhood and Sustainable Citizenship Routes in the Digital Era

KA220-SCH-54F05CB2

GOOD PRACTICE REPORT

Index

1.	Introduction.....	1
2.	Executive summary	1
2.1	Overview	1
2.2	Key elements and good practices	3
2.3	Critical aspects and factors to be considered	4
3.	Detailed reports: annexes with narrative reports from each country	5

1. Introduction

The objective of EACH project is to promote collaborative educational approaches and practices which – through the use of digital technology as a tool for inquiry, discovery, and discussion – can support the development of critical thinking, environmental awareness, and sensitivity to climate change issues.

Work Package no. 3 (“Along the route & suggestions for future travellers) aims at **providing ECEC professionals and practitioners with adequate tools, know-how and competences to properly implement the methodological and conceptual framework for educational intervention** developed in WP2. Indeed, an experimentation of guidelines resulting from WP2 is the core of WP3.

This document summarizes contents and **key findings of the first round of experimentation**, which took place in 3 countries (Italy, Poland and Portugal), from December 2024 until April 2025.

In each country, 3 different groups of children (9 groups in total) were involved in a cycle of 10 collaborative and participative sessions each (90 sessions in total). Practitioners have constantly received support from academic partners.

2. Executive summary

2.1 Overview

Based on the observation of the sessions, two elements deserve to be emphasized:

1. **Children's commitment was highly driven by emotional engagement.** In particular, **wonder and surprise** were elicited by:
 - a. **Digital technologies.** They proved **to be important in prompting and fostering involvement and attention.**

For example, during one of the activities, including the use of **Google Earth**, the observation of the Earth from 63,000 km above prompted awe and imaginative reasoning. Questions were addressed to the adults (e.g., "How did you manage to take a picture of the planet?"), children formulated hypotheses (e.g., "With a rocket that had a phone attached to it") and engaged in critically evaluating and refuting hypotheses provocatively suggested from adults (e.g., "We tied a camera to a bird's leg and made it fly beyond the atmosphere"). Additionally, the **images and simulated travel experiences** using Google Earth sparked curiosity and willingness to explore the characteristics of various locations around the planet. These tools also encouraged children's proactiveness and narrative expression. During other sessions, looking at the **pictures that children had taken** in a PowerPoint presentation on the big screen of the class prompted several discussions. **Recording short videos or voice messages** to take notes and explain ideas helped in gaining children's engagement and commitment, too.
 - b. **Open-ended stimuli**, involving children **not only at a cognitive but also at an emotional, creative, and physical level. They allowed children to have embodied experiences.**

Children had the opportunity to experience a combination of tactile engagement, open-ended material use, freedom of movement, and an emotionally safe atmosphere that encouraged spontaneous exploration.

It is worth noting that **when excessive time was dedicated exclusively to dialogue**, without accompanying physical or creative engagement, **attention dropped very rapidly.**
2. **Dialogue is one of the outcomes, not a given starting point. Different** results were observed among **classes that had and had not previously experienced the Philosophy for Children (P4C) approach**, as well as among classes consisting of children of **different ages**. In particular,
 - a. **In the classes where P4C was introduced for the first time**, children rarely addressed each other directly. Their verbal and non-verbal communication was primarily directed toward the facilitator. The focus of the sessions often remained on self-presentation, claiming one's own point of view, and defending its uniqueness and correctness (e.g., "I already said that," "What you said isn't true"). Personal narratives unrelated to the initial prompt and instances of imitation (echoing others' answers) were frequently observed. Overall, the children showed **interest towards the activities. However, this was more often motivated by a desire to be "seen and heard" individually, rather than by a shared commitment to collective dialogue or group growth.**

For this reason, it was essential to **provide clear rules and structures for the activities.** While such frameworks may at times limit children's free expression, which is highly valued in the pedagogy of P4C, they also establish the conditions necessary for the effective implementation of the workshop. For example, the use of the "talking stick" (only the person holding it may speak, while others are expected to listen) imposes certain constraints on children's freedom of speech. Yet, it facilitates the observance of silence, attentive listening, and respectful turn-taking. Similarly, the use of 'directive' or guiding questions can serve to shape the dialogue without entirely restricting openness.
 - b. **In classes with 4-year-old children, difficulty and resistance in perspective shifting and taking** were observed. Five-year-old children participated in dialogue in a more organized way than younger ones. Additionally, the observation of younger children's interactions

suggests a **need for adaptive pacing and more varied modes of participation**, particularly for kinaesthetic learners.

In sum, time and practice are crucial. It is essential to **establish the foundations of the process first**, and to carefully **consider the socio-cognitive developmental stage** reached by the children, adapting activities and goals accordingly.

Overall, **the emotional tone of the sessions played a vital role.** The sense of psychological **safety and joy** supported risk-taking, openness to feedback, and willingness to adapt. **Trusting adult-child relationships** and a **non-judgmental atmosphere** enabled children to express themselves freely. **Thought-provoking questions** helped children explore both concrete and abstract reasoning.

What fostered collaboration was not formal planning or adult-guided division of labour, but rather a prepared environment that offered freedom within structure, rich sensory materials, shared physical space, space for slow thinking, and shared meaning-making.

2.2 Key elements and good practices

Valuable practices identified throughout the countries are the following:

1. **Drawing** can be taken up as a **tool for thinking, which allows children (all of them, including those with disabilities or special educational needs) to express themselves when they find it hard to articulate their points of view verbally**, and when they reach a moment in which no more reasons can be given. Therefore, it seems essential to use it to foster collaborative thinking. Additionally, drawing might be the most effective way **to confirm when some progress in awareness has been achieved.**
2. **Engage children in multisensorial experiences** (e.g. looking at photos also meant “feeling” the sounds, smells, and bodily sensations: “brrr, it feels cold”; “it’s really hot”), which proved to involve children with severe cognitive disabilities, too.
3. **Build on the complementary and mutually enriching relationship established between digital and analogue experiences** (e.g. Google Earth images and drawings; use of magnifying glasses and of the zooming function of the digital camera, etc. For example, the use of digital photos enabled children to revisit and reflect on their ideas, helping them bridge experience with abstract thought. They discussed differences between photo and drawing, as well as subjectivity in representation, laying a foundation for critical literacy) **and on integration of expression and reflection** (e.g., after recording, the children engaged in conscious processing of their experience, discussing the emotional qualities of the sounds, expressing preferences, and creating visual representations. This helps to attribute a personal meaning to every experience).
4. **Build on self-efficacy perception.** For instance, when **taking photographs by themselves**, children showed great satisfaction (“I took this one!”, “I managed to do it myself!”). Taking digital photos without adult supervision was engaging for all and seeing their own photos after they had taken them provided **a sense of recognition of the accomplishments and a sense of ownership over their ideas.**
5. **Focus on purposeful use of real, functioning tools: digital devices** should be framed as **tools for discovery**, not for entertainment.

6. **Outdoor activities** proved to be crucial for fostering collaborative behaviour and maintaining attention and engagement. In particular, the forest setting (Be Montessori school, in Poland) further encouraged an emphasis on sensorial engagement and interpersonal dialogue. The natural environment provided a rich stimulus for inquiry and dialogue. Children’s reasoning evolved from intuitive associations to more layered reflections, especially during group discussions and photo presentations.
7. **Different sessions duration can be considered:** whether classes are familiar with P4C, sessions can last up to 1/1,5 hours. If not yet, the session may last a maximum of 50 minutes.

2.3 Critical aspects and factors to be considered

1. **Existence of rules and precepts taught by adults, as far as environmental awareness is concerned.**

It is crucial to recognize that children do not approach these topics with a neutral background, as they carry with them a set of acquired knowledge and norms. In general, children are already quite aware of what to do in terms of recommended behaviours (recycle, avoid cars, don’t waste water).

As a result, fostering the expression of personal ideas often becomes complex, as children’s words sometimes come across as “empty and repetitive”: they recall rules and precepts they have been taught and they feel the need to demonstrate to adults what they have learned, without necessarily understanding the reason behind certain environmentally responsible behaviours. **They hold to beliefs they’ve been taught but have not internalized them as their own.**

The element that most effectively fostered a connection with Nature, the environment, its features and related issues has been the **opportunity to link these themes to the children’s own intimate world and/or to embodied and sensory engagement with materials and spaces** (e.g. not just talk about the environment, but also build it, shape it, and care for it). In general, environmental awareness was supported by **sensory, embodied, and imaginative learning experiences that were emotionally relevant, rather than relying on verbal abstraction** (e.g. when children engaged physically and imaginatively with materials – such as touching tree bark, recording bird sounds, and collecting seeds – and emotionally connected with others).

Therefore, practitioners should refer to activities that **introduce children to the themes of environmental sustainability and to the question “why should I care about Nature?”, not by invoking adult-like moral reasoning, but by engaging them through their personal, intimate, and emotional-affective experiences.** Questions concerning environmental ethics should not be posed through adult rationales (e.g., “what should we do to help the environment?”), as such questions often elicit responses that merely echo adult norms and lack authenticity or personal significance. Instead, stimuli that genuinely matter to children and activate their curiosity and attention should be prioritized (what do I love about Nature and why? Might that be threatened? What could I do to protect and preserve it?).

In general, since “indoctrination” is not the goal, **expectations** about environmental awareness should be redefined **based on children’s age and their cognitive/moral development stage:** unlikely, 4-5-year-old children will develop a specific vocabulary and/or understanding and sense of urgency about specific environmental issues and concerns (e.g. pollution, global warming, etc.), making explicit connections and using cause-effect reasoning.

2. **Focusing on one of the three axes of the project** (climate change and environmental awareness, digital education, and collaborative critical thinking skills) **at a time** (in each session) might help to have clearer and more sustainable objectives (**vs. excessive focus and load of information**). They should be chosen in turn as to make sure that there is interconnection, establishing continuity between the different sessions.
3. **Limited time was dedicated to explore each stimulus.** Although there was an effort to avoid rushing, exploring the material in the portfolio revealed that a sequence of only ten sessions is too short to promote a durable critical stance towards digital technologies. Spending more time on each theme enhances both the attribution of meaning and the perceived relevance for children. Therefore, fewer but more in-depth activities are recommended.
Without comparison and **follow-up sessions to build upon the introduction of technological tools**, it feels impossible to build a critical attitude towards the digital world, suggesting continuity might be key to ensure a critical attitude for the digital transformation. In general, expectations about digital competences and literacy should be set based on children's age and their cognitive development stage, too. For example, adults cannot probably expect 4-5-year-old children to understand how smartphones or digital cameras work and/or explore their affordances and implications.
4. **In some of the schools involved in the experimentation, the school garden is usually experienced by children as a setting for unstructured free play and physical activity** rather than as an extension of the indoor learning environment. Under these circumstances, it was challenging to reframe that space in a short time as an open-air classroom. As a result, it proved **challenging to maintain focus** during the initial outdoor activities: attention spans and levels of concentration were notably brief. Therefore, **after the first 2 sessions, it was decided to carry out outdoor activities in a different setting** (a nearby public park), which could take on a new and different meaning for the children.
Within the forest school context, a need for stronger strategies to sustain reflective attention in open-air settings, particularly during longer circle discussions arose.

3. Detailed reports: annexes with narrative reports from each country



**EACH - Early
Childhood and
Sustainable
Citizenship Routes**



EDUCATIONAL EXPERIENCES NARRATIVE REPORT

School name and location:	Scuola dell'infanzia Abba, Bologna (Italy)
Number of groups:	1
Number of children involved:	13
Age range:	5 years old
Term:	December 2024 – March 2025

1. BACKGROUND: contextual information and educational approaches

Brief description of the project (general purpose/objectives, number and dates of the meetings, timeline, proposed activities, starting points for discussion selected in each of the meetings, etc.)

The **ten scheduled sessions** were held **weekly** (every Wednesday) **from December 4th 2024, to March 5th 2025**, with a break during the Christmas holidays.

The group consisted of **13 children, all five years old**, from the same class. Among them were **two children diagnosed with autism spectrum disorder (ASD) and four with special educational needs** (related to selective mutism or to difficulties in socio-emotional and/or verbal communication areas).

The objective of the programme was to promote collaborative educational approaches and practices which – through the use of digital technology as a tool for inquiry, discovery, and discussion – would support the development of environmental awareness, critical thinking, and sensitivity to climate change issues.

The educational and pedagogical methodology chosen for the intervention was Philosophy for Children (P4C), an approach that the children had not previously experienced.

Each session included a welcome and presentation of the planned activity, an initial activation phase, and a collective closing moment with elaboration of the experience (sometimes in the form of individual drawings), concluding with farewells and a preview of the next meeting.

The prompts used to activate discussion varied and were linked to key themes such as:

1. What does a Nature explorer do, and what belongs to Nature?
2. Which elements of Nature are interconnected, and why?
3. What do humans need in order to survive? Why? What do I need?
4. What is extraordinary and special about the school garden? Are trees alive?
5. Can we recognize sounds produced by the computer? Do sounds trigger emotions? Which ones?
6. Let's observe the photos of a photojournalist and then let's take pictures of our favourite tree.
7. If someone wanted to cut down all the trees in our garden, what would we say and how would we behave?
8. What do I see with my naked eye, through a magnifying glass, and what/how do animals see? The relativity of perspective.
9. Let's observe the world from above using Google Earth.
10. The myth of Atlas.

2. COLLABORATIVE KNOWLEDGE-BUILDING PROCESS

2.1 OBSERVATION

<p>1. How have the children participated? How (if) has their participation changed throughout the sessions?</p>	<p>The first session was designed as an “ice-breaker” to allow the group and the facilitator – who was new to the children – to get to know each other in a playful manner. Each child introduced themselves by saying their name at different speeds (normal, slow, fast) and shared something they enjoyed doing.</p> <p>Throughout the sessions, the level and type of participation evolved, particularly in how the children responded and gave meaning to stimuli. However, children rarely addressed each other directly; their verbal and non-verbal communication was primarily directed toward the facilitator. Many showed difficulty engaging in dialogical space and listening to others’ contributions. Overall, the children displayed significant interest in the activities, although this was more often motivated by a desire to be “seen and heard” individually, rather than by a shared commitment to collective dialogue or group growth.</p>
<p>2. What was the role and the activities of the adult/guide/facilitator?</p>	<p>All sessions were facilitated by a member of the Filò association, whose primary role was to stimulate dialogue and reflection (especially encouraging children to justify their points of view) and ensure that each child had the opportunity to express himself and to be listened to. The facilitator also played a crucial role in synthesizing the session’s content, making each phase explicit and meaningful. Furthermore, the facilitator adapted the guidelines to the specific context, taking into account her external role relative to the class’s regular educational staff.</p>
<p>3. If different from the practitioner, what role did the class teacher play?</p>	<p>Classroom teachers were present throughout the project, observing and assisting with the practical activities.</p>

2.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

<p>1. What fostered the collaborative-participative process? Which were the factors impacting on social, critical thinking and meta-cognitive skills?</p>	<p>The following elements fostered collaborative knowledge-building and supported active listening and dialogue:</p> <ol style="list-style-type: none"> 1. Shared rules for the discussion environment, including the use of a “talking stick” (a coloured wooden stick) to manage turn-taking and a silent signal for quiet. While the talking stick may have limited some children, it enabled others – such as the child with selective mutism – to participate. Holding the stick did not compel speaking, but no
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one could speak without it. These moments of silence and waiting created space for contributions from those who do not usually speak and helped the people who often dominate interactions to establish self-control.

2. **A playful and relationally close facilitation style:** the facilitator took a personally involved and friendly posture, ensuring everyone had a chance to speak.
3. **The use of drawing as a valuable mediating tool** for all children, including those with disabilities or special needs.
4. **The ability to elicit wonder and surprise**, for instance during the Google Earth activity, when the group observed Earth from 63,000 km above. This prompted awe and imaginative reasoning. Questions were addressed to the adults (e.g., “How did you manage to take a picture of the planet?”); the children formulated hypotheses (e.g., “With a rocket that had a phone attached to it”) and engaged in critically evaluating and refuting hypotheses provocatively proposed from the adult (e.g., “We tied a camera to a bird’s leg and made it fly beyond the atmosphere”).
5. The **use of digital technologies**, which effectively captured and maintained the children’s attention.
6. **Time and repeated practice:** dialogue is the outcome, not the starting point. During the 4th session, for instance, a child asked: “How can we remember that we need to raise our hand if we want to speak?” Classmates responded with several suggestions, such as: “You can ask a classmate,” “You can observe the example set by others,” and “I can remind V. to raise her hand if she needs help.” These interactions revealed more evident signs of active listening, mutual support, and a cooperative attitude. In the 10th and final session, when the adult asked, “Do you think we should help Atlas?”, it was possible to observe how listening to others’ perspectives led some children to reconsider their initial stance. One child, who had initially stated, “No, because he didn’t ask for help and we’re not strong enough,” revised his position after hearing others’ reasoning: “Yes, because he needs to rest. He needs to go home, have a snack, and relax. We are strong enough to help him.” The child subsequently stated, “OK, I’ve changed my mind.”
7. The **nature of the stimuli proposed**, which were **open-ended and involved not only cognitive engagement but also emotional, creative and bodily dimensions**. For example:
 - a. The activity of connecting various natural elements, which implied **physically linking different images with adhesive tape**, encouraged the articulation of individual viewpoints. It also brought out unexpected or unconventional connections (e.g., mouse–forest: the mouse hides among the forest leaves; hen–

	<p>sun: the hen lives in the countryside, and there is sun in the countryside; bird–sun: the bird flies in the sky, where the sun is; cat–water: cats dislike water).</p> <p>b. The use of digital sound stimuli (produced by a computer) prompted reflection based on a “both-and” mode rather than the “either-or” one: can a sound represent more than one thing? Could this sound be <i>both</i> a river flowing <i>and</i> rain falling? Could it be thunder or a firecracker? The fact that sounds could only be heard and not seen made their interpretation even more subjective.</p> <p>c. The use of digital photographic images, which could be enlarged or reduced, enabled different perspectives, which were then articulated and justified (“It’s fog/It’s low clouds”; “It’s light from a fire/It’s a beam of sunlight”). Children also noticed specific details (“From the man’s hat and clothing, I can tell it’s cold”; “The sand-covered car tells me we’re in a desert”).</p> <p>d. The picture book “<i>Eye Spy: Wild Ways Animals See the World</i>” facilitated perspective-taking. The children were invited to imagine themselves as a tiny snail, first on someone’s hand, then on the grass: what would they see and hear? Some responses included: “The grass would be huge,” “I’d be afraid of pigeons and all the other animals that might eat me.”</p> <p>e. Google Earth, which enabled aerial views (“It’s like we’re an eagle, a bird, a seagull”; “It’s like we’re riding on an eagle’s back”) and fostered a new observational perspective (“The trees look like broccoli,” “The bushes look like lettuce,” “The school roof looks like melted chocolate”).</p>
<p>2. What might have hindered the collaborative-participative process?</p>	<p>Factors that limited the development of a co-constructive knowledge-building process were mainly:</p> <ol style="list-style-type: none"> 1. Limited familiarity with collaborative and participatory learning processes. The lack of prior experience meant that – particularly in the initial phases – the focus of the sessions often remained on self-presentation, the assertion of one’s own point of view, and the defence of its uniqueness and correctness (e.g., “I already said that,” “What you said isn’t true”). 2. Occasionally excessive time dedicated exclusively to dialogue, without accompanying physical or creative engagement. In most cases, after approximately 10-15 minutes of purely verbal interaction, conversations became repetitive. For this particular group, relying solely on cognitive-verbal engagement (without bodily or playful involvement) represented a limiting factor. Consequently, the proposed activities – compared to those outlined in the official guidelines – were reduced both in terms of content and duration.

	<p>3. The typical use of the school’s outdoor space. Since the school garden is usually experienced by children as a setting for unstructured free play and physical activity – rather than as an extension of the indoor learning environment – it is difficult to reframe that space in a short time as an open-air classroom. As a result, it proved challenging to maintain focus during the initial outdoor activities: attention spans and levels of concentration were notably brief. Therefore, in the final three sessions, it was decided to conduct outdoor activities in a different setting (a nearby public park), which could take on a new and distinct meaning for the children.</p>
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3. ENVIRONMENTAL AND CLIMATE-CHANGE CHALLENGES

3.1 OBSERVATION

<p>1. Have children generated a shared knowledge about environmental issues? What was the process?</p>	<p>In general, it proved challenging to stimulate reflections on environmental sustainability and issues related to climate change. The following observations were made:</p> <ul style="list-style-type: none"> ● Children showed limited familiarity with elements of the natural world. During the sound recognition activity (using digital audio clips), children generally found it easier to identify human-made sounds than those from nature. For instance, the sound of crickets was described as “the sound of the night and the moon”, rather than being recognized as the sound of a specific animal. ● Responses to adult questions about the environment and the importance of its protection (e.g., “Why should the mayor not cut down all the trees in our garden?”) often appeared “adult-like” and not really problematized (“because trees produce oxygen,” “it’s not good to leave the water running, cut down trees, or waste tissues,” “we wouldn’t have paper anymore”). It is important to recognize that children do not approach these topics with a neutral background, as they carry with them a set of acquired knowledge and norms. As a result, fostering the expression of personal ideas becomes complex, as children’s words sometimes come across as “empty and repetitive”: they recall rules and precepts they have been taught and feel the need to demonstrate to adults what they have learned, without necessarily understanding the reasoning behind certain environmentally responsible behaviours. This raises the question of whether they truly disagree with cutting down trees, or whether they are simply saying what they believe adults expect to hear. ● A strong focus on the self and one’s immediate world. When asked, “What do you need to survive?”, children’s responses were highly personal and intimate (e.g., “my
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	<p>mom,” “my family,” “my favourite pillow,” “football”). At this developmental stage, such responses are expected. However, when the question was reframed as “What do human beings need to survive?”, answers shifted toward universal primary needs, with references to the natural world (e.g., “grass,” “air”), and biological conditions (“having blood, lungs, etc.”). It would have been particularly insightful to have time to compare these two types of responses, by asking children why they thought their answers differed depending on the phrasing of the question.</p>
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3.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

<p>1. What <u>fostered</u> children's environmental awareness and the promotion of their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>The element that most effectively fostered a connection with Nature, the environment, its features and related issues was the opportunity to link these themes to the children’s own intimate, personal, and emotional spheres. Examples include reflections such as: “The sound of traffic makes me feel anxious because it reminds me of when we’re in the car and we’re going fast”; “The sound of crickets reminds me of a phone ringtone: when it rings, it means I can’t play with my mom, dad, or siblings anymore because they have to answer it.” Similarly, some children opposed the idea of cutting down the garden’s trees with arguments grounded in personal experience or emotional reasoning: “There wouldn’t be any more goals to play football,” “There wouldn’t be places to play hide and seek”, “The trees would feel pain and it would hurt the Earth”, “It would be dangerous because when the trees fall, they could destroy the school”.</p>
<p>2. What might have <u>hindered</u> children's environmental awareness and their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>The factors that hindered the development of a critical environmental awareness were primarily the following:</p> <ol style="list-style-type: none"> 1. The developmental stage and level of moral reasoning typical of children of this age group (see Kohlberg 1984, Gilligan 1982, Matthews 1994, Narvaez 2005 - https://www.ebsco.com/research-starters/religion-and-philosophy/moral-development). At the age of five, how can children perceive their own well-being and happiness (i.e., their personal utility) as being directly connected to Nature and environmental stewardship? It is essential to identify pathways that introduce children to the themes of environmental sustainability and to the question “why should I care about Nature?”, not by invoking adult-like moral reasoning, but by engaging them through their personal, intimate, and emotional-affective experiences. Questions concerning environmental ethics should not be posed through adult rationales (e.g., “what should we do to help the environment?”), as such questions often elicit responses that merely echo adult norms and lack authenticity or personal significance.

	<p>Instead, stimuli that genuinely matter to children and activate their curiosity and attention should be prioritized.</p> <ol style="list-style-type: none"><li data-bbox="922 172 2020 528">2. The (often implicit and latent) tendency of adults to impose their own beliefs. In the domain of environmental sustainability and the climate crisis, this risk is particularly high, given that we, as adults, perceive our very survival to be at stake in relation to the environment. It is thus inevitable that a certain tension arises when using a community of inquiry approach in conjunction with an educational agenda aimed at transmitting specific values and ideas to children. On one hand, Philosophy for Children (P4C) values freedom of thought and aims to create the conditions for children to develop autonomous and critical thinking through dialogue. On the other hand, in the field of education for sustainability and climate awareness, we clearly hope that children will internalize specific values and beliefs.<li data-bbox="922 528 2020 671">3. The difficulty in identifying a coherent narrative thread that could link and give meaning to all the carried-out activities. Activities specifically related to environmental themes may have appeared somewhat disconnected or isolated from one another, lacking a unifying conceptual framework.<li data-bbox="922 671 2020 971">4. The limited time allocated to exploring each stimulus. Especially when stimuli are not integrated into the everyday school routine (for example, when the project is led by external experts who meet with children only once a week), it becomes crucial to dedicate more time to each activity, allowing for deeper exploration and reflection. Spending more time on each theme enhances both the attribution of meaning and the perceived relevance for children. Consequently, fewer but more in-depth activities are recommended. Ideally, greater continuity with the groups would allow for more substantial engagement and thematic development.
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4. DIGITAL TECHNOLOGIES

4.1 OBSERVATION

1. How have children used Digital Technologies?

Children actively interacted with digital technologies, sometimes directly (e.g., through the use of a digital camera), and other times indirectly or in a mediated way (e.g., by participating – through guidance and requests – in the use of Google Earth). The kind of interaction they had with the computer indicated that it is a “familiar” tool for them (in response to the adult’s question “Do you ever listen to sounds coming from a computer or tablet?”, the answer was: “Yes, music”).

4.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

1. What fostered a critical approach to digital technologies?

The elements that fostered an active and critical approach to digital technologies included:

1. **The opportunity to engage in multisensory experiences**, which also fully involved children with severe cognitive disabilities. Looking at photos also meant “feeling” the sounds, smells, and bodily sensations: “brrr, it feels cold”; “it’s really hot”.
2. **The chance to reflect on the “advantages” offered by the digitalization of images, sounds, and information**: “I like computer pictures because you can see places in the world where I’ve never been”; “I like computer pictures because they remind me of happy memories”.
3. **The perception of self-efficacy**. For instance, when taking photographs themselves, children showed great satisfaction: “I took this one!”, “I managed to do it myself!”. The ease and intuitiveness of certain digital tools support the development of self-efficacy.

2. What might have hindered a critical approach to digital technologies?

A lack of knowledge and deeper understanding of how children actually use and experience digital technologies in their daily lives (i.e., which devices they use, how they use them, what experiences/thoughts/emotions are linked to this use, etc.) makes it more difficult to promote a truly critical use of these technologies.

APPENDIX - EXPERIMENTATION DOCUMENTATION

Session nr. - Date	Topic	Pictures
<p>#1 4/12/2024</p>	<p>What does a Nature explorer do, and what belongs to Nature?</p>	
<p>#2 11/12/2024</p>	<p>Which elements of Nature are interconnected, and why?</p>	
<p>#3 18/12/2024</p>	<p>What do humans need in order to survive? Why? What do I need?</p>	

<p>#4 15/1/2025</p>	<p>What is extraordinary and special about the school garden? Are trees alive?</p>	
<p>#5 29/1/2025</p>	<p>Can we recognize sounds produced by the computer? Do sounds trigger emotions? Which ones?</p>	

<p>#6 5/2/2025</p>	<p>Let's observe the photos of a photojournalist and then let's take pictures of our favourite tree</p>	
<p>#7 12/2/2025</p>	<p>If someone wanted to cut down all the trees in our garden, what would we say and how would we behave?</p>	
<p>#8 19/2/2025</p>	<p>What do I see with my naked eye, through a magnifying glass, and what/how do animals see? The relativity of perspective</p>	

<p>#9 26/2/2025</p>	<p>Let's observe the world from above using Google Earth</p>	
<p>#10 5/3/2025</p>	<p>The myth of Atlas</p>	



**EACH - Early
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EDUCATIONAL EXPERIENCES NARRATIVE REPORT

School name and location:	Scuola dell'infanzia Progetto 1-6, Bologna (Italy)
Number of groups:	2
Number of children involved:	22
Age range:	4 years old
Term:	January – March 2025

1. BACKGROUND: contextual information and educational approaches

Brief description of the project (general purpose/objectives, number and dates of the meetings, timeline, proposed activities, starting points for discussion selected in each of the meetings, etc.)

Two groups of children (10 and 11 children respectively), from three different classes but of the same age (4 years old), participated in a 10-session educational program designed to explore questions and connections related to nature, the environment, and the tools used to investigate and deepen understanding of these themes. This exploration also included the use of digital tools, such as cameras and projection-based applications like Google Earth. In the second group, named "Group 2", there was a child with a certified disability and special educational needs. Overall, she was able to participate in the proposed activities, although often through parallel engagement, as she does not use verbal language and experiences attention and visual attunement difficulties. These characteristics limit her active participation; however, she enjoys spending time with her peers, particularly during outdoor activities in the garden, where she is free to move around and interact, albeit under the constant supervision of a support educator.

The pedagogical-didactic approach selected for this program was Philosophy for Children (P4C), an approach that the children had not previously experienced.

Each session included an introductory welcome phase, a presentation of the activity to be carried out, an activation phase, and a collective closure with opportunities for both individual and group reflection, followed by a farewell and anticipation of the next session.

Activation elements were varied and linked to specific thematic prompts, such as:

1. What does a nature explorer do?
2. What belongs to nature and what does not? Are things connected, and why?
3. What do I see in the school garden that I have never seen before?
4. How many details can we observe in a tree?
5. The sounds of nature
6. The sounds of nature and photographs of its elements taken by the children
7. What should the ideal garden include?
8. The other inhabitants of nature (animals)
9. Observing the world from above or from the ocean floor (Google Earth)
10. The myth of Atlas

2. COLLABORATIVE KNOWLEDGE-BUILDING PROCESS

2.1 OBSERVATION

<p>1. How have the children participated? How (if) has their participation changed throughout the sessions?</p>	<p>Throughout the entire program, both groups showed difficulty in establishing a conversation rhythm leading to respectful dialogue. Most often, the children responded individually to the facilitator's questions, with limited instances of extended conversations emerging from peer-to-peer exchanges or reflections. Nonetheless, by the end of the process, the children demonstrated an improved understanding of the steps proposed by the facilitator. They showed a greater inclination toward activities that incorporated physical movement and embodied experiences. Overall, attention levels during circle-time sessions tended to decline after approximately ten minutes.</p> <p>Carrying out certain sessions outdoors proved beneficial for prompting engagement and subsequently gathering more meaningful feedback during the closing phase. Conversely, conducting entire sessions indoors was almost always particularly demanding in terms of maintaining focus and participation. Peer collaboration was consistently more effective when the proposed activities allowed for or encouraged one-to-one interactions.</p>
<p>2. What was the role and the activities of the adult/guide/facilitator?</p>	<p>The facilitator from the association Filò fully carried out all P4C sessions. Her primary role was to activate and stimulate dialogue and reflection – particularly encouraging children to articulate and justify their own points of view – and to ensure that each participant had the opportunity to be heard. She also played an important role in synthesizing the content of each session, making the various steps explicit and helping the children to attribute meaning to them.</p>
<p>3. If different from the practitioner, what role did the class teacher play?</p>	<p>The role of the pedagogical coordinator – who was present at all sessions – was that of an external observer, albeit in close proximity to the group. In some instances, she supported group dynamics, particularly when children's attention began to drift. The classroom teachers participated only in a few sessions, and in those cases, their role was primarily focused on helping to regulate the children's attention.</p>

2.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

<p>1. What <u>fostered</u> the collaborative-participative process? Which were the factors impacting on social, critical thinking and meta-cognitive skills?</p>	<p>Collaboration was supported through group feedback moments – such as the creation of posters – and by the facilitator’s consistent emphasis on the “here and now” and on the activity at hand. The children frequently provided decontextualized responses, often shifting to personal narratives unrelated to the initial prompt. The response process frequently showed signs of imitation, with children echoing one another's answers. As a result, it was often necessary to reformulate questions using more engaging and imaginative entry points. Children’s responses were often limited to simple affirmations or negations ("yes" or "no"); however, in some cases, a few children articulated their thoughts more fully and hypothesized possible solutions to imagined scenarios (e.g., “If the garden had no more trees, I would call the gardeners to plant them again”).</p> <p>Although each session was initially planned to last one hour, in several instances the duration was reduced to 45–50 minutes due to declining attention levels and a general lack of responsiveness to the facilitator’s guidance.</p> <p>Certain activation tools proved effective in enhancing attention – for instance, the session involving cameras, videos, and printed photographs taken by the children. In general, the integration of digital tools supported concentration, particularly due to the element of surprise and wonder that characterized their introduction.</p> <p>More broadly, collaborative processes tended to be short-lived and were effective only when accompanied by continuous facilitation from the educator leading the session. Visual aids – such as drawn "maps" to guide the children’s thinking (e.g., the “tree drawing”) – also proved helpful in supporting reflection and structuring thought.</p>
<p>2. What might have <u>hindered</u> the collaborative-participative process?</p>	<p>Overall, a key factor that hindered the collaborative process was the children’s limited attention span, which did not facilitate the exchange of opinions among peers, except in a few specific instances that were actively encouraged by the facilitator.</p> <p>Furthermore, the indoor space used for the sessions – a transitional area with frequent passage of other individuals – did not support concentration. This negatively impacted both collaboration and active participation.</p>

3. ENVIRONMENTAL AND CLIMATE-CHANGE CHALLENGES

3.1 OBSERVATION

1. Have children generated a **shared knowledge about environmental issues**? What was the **process**?

Given the difficulty in nurturing dialogue, it was equally **challenging to perceive a cohesive group position in relation to the topics introduced**. On several occasions, the facilitator asked the children to express support for one viewpoint or another by raising their hands. However, in many cases, the session proceeded with a change of question, as the group did not appear interested in exploring or expanding on the topic. Only a few individual contributions led to thought-provoking discussions, though these were not followed up by the group. Rather, they unfolded within a “one-to-one” dynamic between the child and the facilitator, while the rest of the group displayed limited attention and engagement.

3.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

1. What **fostered** children's environmental awareness and the promotion of their active role in addressing climate change issues and promoting environmental sustainability?

The **images and simulated travel experiences** using Google Earth **stimulated curiosity and openness toward exploring the characteristics of various locations around the planet**. These tools also encouraged children’s proactiveness and narrative expression. Similarly, **viewing photographs** – both their own and those of their peers – fostered mutual exchange and interaction. The structure of the sessions included an **alternation between playful, physical activities and reflective moments**: this alternation gradually fostered a connection between practice and thought. With regard to the topic of climate change, reflections remained quite general or were guided by the facilitator, who prompted children to express preferences on specific questions (e.g., “more plants or more playground equipment in the garden?”).

2. What might have **hindered** children's environmental awareness and their active role in addressing climate change issues and promoting environmental sustainability?

Overall, **the ten sessions should be considered as an initial introduction to basic reflections** which – if they are to be deepened and made truly meaningful – would **require greater continuity, regular practice in active listening, and a more in-depth understanding of the group itself**. The **children’s attention span** did not allow for more in-depth connections to be made regarding the topics addressed during the sessions.

4. DIGITAL TECHNOLOGIES

4.1 OBSERVATION

1. How have children used Digital Technologies?

The children actively engaged with digital tools as protagonists of the learning process: they took photographs which were later printed and collaboratively reinterpreted within the group. Some digital applications also supported deeper exploration; for instance, viewing various locations through Google Earth prompted travel narratives, fostering immersive experiences for their peers.

4.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

1. What fostered a critical approach to digital technologies?

Digital tools were integrated into a process of dialogue and shared exploration of specific topics, promoting exchange and participation among all children during the sessions. A particularly noteworthy aspect was the **complementary and mutually enriching relationship established between digital and analogue experiences.**

2. What might have hindered a critical approach to digital technologies?

Limited attention spans often constrained the dialogue process and hindered equal levels of participation among all children.

APPENDIX - EXPERIMENTATION DOCUMENTATION

Session nr. – Date	Topic	Pictures
#1 15/1/2025	What does a nature explorer do?	
#2 22/1/2025	What belongs to nature and what does not? Are things connected, and why?	
#3 29/1/2025	What do I see in the school garden that I have never seen before?	
#4 5/2/2025	How many details can we observe in a tree?	
#5 12/2/2025	The sounds of nature	
#6 19/2/2025	The sounds of nature and photographs of its	

	elements taken by the children	
#7 26/2/2025	What should the ideal garden include?	
#8 5/3/2025	The other inhabitants of nature (animals)	
#9 12/3/2025	Observing the world from above or from the ocean floor (Google Earth)	
#10 19/3/2025	The myth of Atlas	



**EACH - Early
Childhood and
Sustainable
Citizenship Routes**



EDUCATIONAL EXPERIENCES NARRATIVE REPORT

School name and location:	Externato João XXIII, Lisbon (Portugal)
Number of groups:	2
Number of children involved:	32
Age range:	4 years old
Term:	January – March 2025

1. BACKGROUND: contextual information and educational approaches

Brief description of the project (general purpose/objectives, number and dates of the meetings, timeline, proposed activities, starting points for discussion selected in each of the meetings, etc.)

The EACH project aimed to foster critical thinking by collaborative practices while introducing digital technologies in the classroom by focusing on climate change issues and environmental awareness more generally. The school applied it in three different classes (two of four years old and one of five years old). There were ten sessions which were done by either Dina Mendonça (facilitator NOVA University), Aléxis Trindade (Facilitator of School) or by the kindergarten teacher. The P4C methodology grounded the promotion of dialogue. Observation of each session was done by either Dina or Aléxis, or by the kindergarten teacher (Carla Gomes, Liliana Carvalho) or by Susana Cadilha, the other member of NOVA. The sequence of the sessions was thought and decided along the way by the team (Aléxis, Dina and kindergarten teachers) in light of the children's reaction and aiming to test as much material as possible from the portfolio.

Sessions lasted **1/1,5 hours, on a weekly basis.**

With ten sessions it is hard to recognize the progression of collaborative thinking habits. The class of 5 years old had different characteristics and needed a separate description.

The two four years old classes followed more and less the same sequence of session topics (only with slight variation on one or two sessions – see power point description for details). One of the sessions was to go outside to a park and take photos and this was notoriously very important for the children of all classes. Importantly, **activities outside of the classroom were crucially vital for collaborative behaviour.**

Perhaps the most important illustration is the way in which the two classes of four years old were **capable of collaboratively managing sharing the digital tools to take photos without adult supervision.** First the activity itself was engaging for all, second going outside to the park made them happy, and finally **seeing their own photos after they had taken them provided a sense of recognition of the accomplishments.**

The children showed that the visits were important for them, and they expressed disappointment when they were reminded the 10th session was the last and reacted with enthusiasm at the suggestion that Dina would come one last bonus time to do a session in each class (after Easter).

In all classes the Google Earth observation, drawing the playground by imagining, after observation and after seeing it on Google earth was a very important session. Importantly the comparison of various ways of experience (by imagination, by observation and by observation in a technological tool) was hard for 4 years old and the difference in drawing

was only visible in some of the children. Perhaps the explanation can be found in how the literature confirms that. They did the drawing of their school playground but having seen it from the google maps perspective didn't seem to sink in. So there was a **resistance to perspective shifting**, even though Alexis insisted that it was drawing the playground seen from a bird's perspective. At this age they don't all pass the false belief test (The litmus test for the development of a meta representational Theory of Mind is the false belief (FB) task in which children have to represent how another agent misrepresents the world. Children typically start mastering this task around age four. See <https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2021.797246/full>)

There is also difficulty in perspective taking spatially. See:

Despite a large body of research on perspective taking, our knowledge of the individual and task factors affecting the emergence of Level 2 perspective taking is still very limited. One relevant factor was suggested by Fishbein et al. (1972), who found that children from 3–9 years performed better in picture selection tasks if only one object was involved, compared to when an array of three objects was presented (see also Gzesh and Surber 1985). Tasks with only one object may be spatially less complex as no array-internal relations have to be encoded and coordinated with the position (or line of sight) of the observer. Consistent with this notion, Ives (1980) found that responses of children as young as 3 years old were about 90% correct if they were asked whether they would see the front, side, or back of a single fronted object (e.g., a horse) from a specified position. However, several other studies with children from kindergarten to 6th grade have failed to find an effect of number of objects in the array (Brodzinky et al. 1972; Minnigerode and Carey 1974, Nigl and Fishbein 1974).

Another important factor affecting the emergence of perspective taking lies in the nature of the dependent variable and whether it requires the suppression of conflicting frames of reference. Piaget and Inhelder (1956) used picture selection or model building tasks, in which children sat within the frame of reference of a room while attempting to imagine an array from a different vantage point. Huttenlocher and Presson (1973, 1979) found that 8- or 9-year-olds did much better when asked about particular items from a different vantage point (e.g., if you sat over there, what would be closest to you?), and argued that such questions were easier because they suggested a frame of reference other than the surrounding room (i.e., the child's body in an imagined position served as the reference point). Even preschoolers succeed on tasks in which responses are not influenced by conflicting frames of reference (Newcombe and Huttenlocher 1992). Importantly, however, such questions are not easier in general; they are harder when children are asked to imagine the array rotating (Huttenlocher and Presson 1973, 1979). [...] Taken together, a great deal of research tells us that, on tasks that minimize spatial and representational complexity, the basic ability to take someone else's perspective is present from infancy, and may provide the foundation for social cognitive abilities, such as theory of mind (Sodian et al. 2007). However, from a spatial cognition point of view, the spatially rich Level 2 perspective-taking tasks with conflicting frames of reference are interesting because they

concern the ability to represent and coordinate multiple perspectives in one coherent spatial framework. This ability may be ecologically meaningful and predictive of real-world spatial performance, as suggested by research in adults (Hegarty and Walter 2004, 2005). For example, Hegarty and Walter (2004) found that perspective taking was correlated with participants' self-reported sense of direction, which in turn had predictive validity as a measure of spatial cognition in large-scale environments (Sholl 1988, Hegarty et al. 2002). One of the very few developmental studies showed that perspective taking (measured by a modified Three Mountains Task) correlated with performance in a mapping task (Liben and Downs 1993). One reason why individual differences in Level 2 perspective taking and their correlates are little investigated in children may be that there is no simple and easy-to-administer test of the ability.

SEE for details

<https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2014.00386/full>

Nevertheless, the use of drawing indicated that it might be the best way to confirm when some progress in awareness has been achieved.

The focus on environment information diminished the reflection mode at times and was often only recovered by providing a specific mental task (comparing, voicing an opinion on a specific subject); also, **some digital technologies took up the space of the activity making it hard to do anything else. Without comparison and follow up sessions** to build upon the introduction of technological tools it feels **impossible to build critical attitude towards the digital world**, suggesting continuity might be key to ensure critical attitude for the digital transformation.

Though there was no time nor the space to focus on how to overcome **the gap between saying it and doing it, the issues appeared when talking about how to take care of the planet**. In general, the children were **already very knowledgeable about what to do in terms of recommended behaviours** (recycle, avoid car, don't waste water)

Having the collaboration of the school staff (facilitator and kindergarten teachers) was decisive for the success of the sessions and the project. Alexis and Rita did a dissemination board for parents to show the activities the children had done in the sessions, and some activities made part of the classroom life (paintings and drawing were put up on the walls; planted seeds and watching the change was a daily focus after the session on putting seeds in pots to observe the change in nature).

Also, the children seemed to have really enjoyed visits from outsiders of the school (Susana and Dina) expressing their appreciation often.

Some concluding remarks:

	<ol style="list-style-type: none"> 1. To best focus on the three axes of the project (climate change and environmental awareness, digital education, and collaborative critical thinking skills) it might help to select to focus on them in turn as to make sure that there is interconnection. For example: focus on showing google earth and have the dialogue on environmental awareness present without excessive focus; then use the previous experience of watching google earth to have a dialogue about how to take care of the planet and build on how a tool as google earth could help, then a following session returning to google earth with specific items taken from previous dialogue to show how dialogue modifies the way one can explore google earth. 2. In what concerns climate change and environmental awareness, the children in this school in Lisbon seem very much aware of the correct behaviours to adopt, but it is not clear if they understand (and if they can understand) the reasons underlying this need and urgency. Importantly, it requires evaluating how one can establish a distinction between making others aware and forcing others to hold certain beliefs (indoctrination which does not promote critical analysis) which opens a topic for a future philosophical reflection on Ethics and Education to be taken up by the team (as was already mentioned in the meeting at Maribor). Though this is mainly a theoretical research issue which is beyond the scope of the project, it might be a way to disseminate the project outputs showing how theory and practice are inevitably intertwined. 3. Drawing can be taken up as a tool for thinking which allows children to express when they find it hard to express their points of view verbally, and when one reaches a moment in which no more reasons can be given. So, it seems important to use it to think collaboratively. Perhaps, these activities can adopt drawing regularly and equip children to use images to modify images mimicking the critical thinking move. 4. It will be important to revise the portfolio material in light of these insights and generally reinforce how drawing can be used as an inclusive activity to integrate those who are less prone to talk and participate.
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2. COLLABORATIVE KNOWLEDGE-BUILDING PROCESS

2.1 OBSERVATION

<p>1. How have the children participated? How (if) has their participation changed throughout the sessions?</p>	<p>Yes, but participation was not always the same. One effect of P4C methodology is to provide an environment in which people who normally do not verbalize reveal their ability to participate intelligently in an activity. And this was visible and noted by the kindergarten (Liliana 4 years old class) in one of the sessions where the teacher shared that she was surprised on how this person participated often and spoke so well.</p> <p>Some children were drawn to engage in conversation (one to one; or smaller group to adult) after sessions or when sessions enabled walking. One of these issues will be used for the bonus session to take place after Easter (with the topic of “How to talk people into not littering the Park?”)</p>
<p>2. What was the role and the activities of the adult/guide/facilitator?</p>	<p>By selecting an activity from the portfolio, the facilitator would design the best way to present it to the children given what had happened. The facilitator varied and thus the approach also changed. When the kindergarten teacher did the sessions there was less promotion of collaborative dialogue (and more guided interventions), when the facilitator (Dina) guided the sessions there were some moments in which the other facilitator (Aléxis) helped to encourage the children’s participation by offering ways to think about the issues (once by comparison – instead of “what is it like to be an ant?” The guiding question “Is it different or similar to be like a Butterfly and be like an ant?”; another time on discussing the way nature is connected (web of life activity) by promoting comparisons for children, too).</p>
<p>3. If different from the practitioner, what role did the class teacher play?</p>	<p>Often the kindergarten teachers helped children’s behaviour for them to be able to focus on session subject matter either by direct verbal suggestions, or by using the rituals (songs, saying, etc.) of common practice in the classroom</p>
<p>2.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS</p>	
<p>1. What fostered the collaborative-participative process? Which were the factors impacting on social, critical thinking and meta-cognitive skills?</p>	<ul style="list-style-type: none"> – Facilitator asking children to consider what another child had said, avoiding answering for the children when a puzzle appears for the children often wait to hear the answer given by the adult figure and when it doesn’t happen, they feel encourage to revise the process and experience and provide their own answers. – Doing different things also seemed to promote questions. – The enthusiasm of the facilitator when hearing a philosophical idea or reasoning from the children allowed the community of inquiry to dive in the P4C skills and created moments to pause and think/explore what has been said.

<p>2. What might have <u>hindered</u> the collaborative-participative process?</p>	<p>Dealing with misbehave conduct. Children have different abilities of self-control and rarely opportunities to put those self-control abilities in practice (and to practice them to get better at it). Some children are constantly behaving disruptively, and they don't know why. As one of them told me (Dina) when asked "I don't know, my mind is constantly going on and then I do something".</p>
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3. ENVIRONMENTAL AND CLIMATE-CHANGE CHALLENGES

3.1 OBSERVATION

<p>1. Have children generated a shared knowledge about environmental issues? What was the process?</p>	<p>Yes, the focus on nature in the ten sessions and the activities they experienced made them much more aware of bugs in the playground and they wanted to digitally record the life they saw like they hadn't done before. Conversations also seemed to highlight the importance of experience and observation in experience.</p>
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3.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

<p>1. What <u>fostered</u> children's environmental awareness and the promotion of their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>The activities which help them verbalize what they already knew about taking care of the environment. Fostering environmental awareness is now an ongoing concern of schools, and very present in the school we worked at. This means the subject in itself was not new.</p>
<p>2. What might have <u>hindered</u> children's environmental awareness and their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>After saying all the things (recycling, helping others, taking care of planet, etc.) the children (5 years old was very visible) did not know what else they could do, and the observer felt both kindergarten teachers and children were trying to find other things to name for promoting the active role and could not say more than what they had been told before the project. It might be useful to know ahead of time what has already been done regarding environmental awareness as to engage in deepening their understanding of the issues they already know.</p>

4. DIGITAL TECHNOLOGIES

4.1 OBSERVATION

1. How have children used Digital Technologies?

The children took pictures with digital cameras (or phones and I-pads), explored as a group Google earth, **looked at the photos they took in a powerpoint presentation on the big screen of the class (that was visibly important in all classes)**, and had several discussions prompted by digital power point presentation of images.

4.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

1. What fostered a critical approach to digital technologies?

- **Comparing analogue with digital** and direct experience (planting seeds, reading a book about seeds and flowers, seeing a time lapse of seed turn into plant/fruit) ALSO comparing seeing from above (experience) and seeing from above with google earth.
- **Drawing** after digital tool collective experience.
- Moments of **dialogue** after digital.
- **Asking “Why?”** And highlighting the importance of giving reasons
- **Common focus to have the dialogue** (powerpoint on needs and wants)

2. What might have hindered a critical approach to digital technologies?

Too much information. Sometimes the digital experience had so much information for the children that it made it difficult for them to engage in any kind of conversation and often they asked to draw when they realized it was also a possibility.
Also, **each session focused on a new item of the portfolio.** Even though there was an effort not to rush and some tasks of the portfolio took up two sessions, **exploring the material in the portfolio showed that ten sessions are too short to promote a durable critical stance for digital technologies.**

PICTURES





**EACH - Early
Childhood and
Sustainable
Citizenship Routes**



EDUCATIONAL EXPERIENCES NARRATIVE REPORT

School name and location:	Externato João XXIII, Lisbon (Portugal)
Number of groups:	1
Number of children involved:	24
Age range:	5 years old
Term:	January – March 2025

1. BACKGROUND: contextual information and educational approaches

Brief description of the project (general purpose/objectives, number and dates of the meetings, timeline, proposed activities, starting points for discussion selected in each of the meetings, etc.)

The EACH project aimed to foster critical thinking by collaborative practices while introducing digital technologies in the classroom by focusing on climate change issues and environmental awareness more generally. The school applied it in three different classes (two of four years old and one of five years old). **This present narrative summary refers to the five years old implementation as they had distinctive characteristics from the other two classes.** There were ten sessions which were done by either Dina Mendonça (facilitator NOVA University), Aléxis Trindade (Facilitator of School) or Rita Rodrigues (kindergarten teacher) and an extra one done by Rita at the request of the children.

The use of P4C methodology grounded the promotion of dialogue and build upon the already visible installed habits of conversation of the group.

Observation of each session was done by Aléxis, Dina, Rita or by Susana Cadilha, the other member of NOVA.

The sequence of the sessions was thought and decided along the way by the team (Aléxis, Dina and Rita) in light of the children's reaction and aiming to test as much material as possible from the portfolio.

Sessions lasted **1/1,5 hours, on a weekly basis.**

With ten sessions it is hard to recognize the progression of collaborative thinking habits. **Though it was clear that the class of 5 years old participated in dialogue in a more organized way than the 4 years old.** The extra session (building of houses in the nature for animals) was a request from the children to do more stuff from the project.

Compare with the other two classes of 4 years old, the five years old class was able to experiment with more suggestions from the portfolio, and the kindergarten teacher did an extra session and plans to continue to explore the portfolio after the implementation period.

One of the sessions was to go outside to a park and take photos and this was notoriously very important for the children of all classes. **However, the dialogue in the five years old was more philosophical than in the other classes.** In this class the **ability to reflect philosophically about issues was easily brought by the dialogue and facilitators** (Aléxis & Dina) have several moments in which the philosophical enthusiasm for ideas was felt and could be connected to discussions carried out in professional philosophical debates.

In this session, for example, while trying to find criteria for why the same photograph could not be taken twice, one of the children explained that temporal ownership prevented the mere repetition. This opened the possibility of discussing the Heraclitus claim on not being

able to step into the same river twice and, in that session, the children revealed being very attuned to giving each other time to think and reflect together, holding several times while waiting for one of the children to think through before participating.

Importantly, **activities outside of the classroom were crucially vital for collaborative behaviour.** And the play in the playground at regular times was one of the moments in which the impact of the project was felt. After the session of photographing outdoors the children asked Rita (kindergarten teacher) for her phone to take picture of an insect in the playground.

The children showed that the visits were important for them, and they expressed disappointment when they were reminded the 10th session was the last and reacted with enthusiasm at the suggestion that Dina would come one last bonus time to do a session in each class (after Easter).

In all classes the Google Earth observation, drawing the playground by imagining, after observation and after seeing it on Google earth was a very important session. Importantly, the comparison of various ways of experience perception by imagination, by observation and by observation with aid of a technological tool was decisive for changes in drawing. Overall, this reinforced the way in which **drawing might be the best way to confirm when some progress in awareness has been achieved.** The visualization of google earth was visibly transferred to the drawing ability and how taking a perspective from above changed the way a car, for example, was drawn (see power point).

Also, comparing the google earth with observing a globe, and looking at maps promoted dialogue among the children and it was welcome by the five years old.

In the session on “Can one step into the same river twice?” the variation on the force of reasons was also very clear, as reasons that felt stronger were taken up by other children, while reasons which were perceived as weaker were not repeated.

The focus on environment information diminished the reflection mode at times and was often only recovered by providing a specific mental task (comparing, voicing an opinion on a specific subject); also, **some digital technologies took up the space of the activity making it hard to do anything else. Without comparison and follow up sessions** to build upon the introduction of technological tools it feels **impossible to build critical attitude towards the digital world,** suggesting continuity might be key to ensure critical attitude for the digital transformation.

Though there was no time nor the space to focus on how to overcome **the gap between saying it and doing it, the issues appeared when talking about how to take care of the planet.** Children were already very knowledgeable about what to do, but not clear on how to promote those behaviours in others (besides their parents and other close people by

repeating the message). Perhaps some material of the portfolio could focus on this difficulty of life.

Having the collaboration of the school staff (facilitator and kindergarten teachers) was decisive for the success of the sessions and the project. Alexis and Rita did a dissemination board for parents to show the activities the children had done in the sessions, and some activities made part of the classroom life (paintings and drawing were put up on the walls; planted seeds and watching the change was a daily focus after the session on putting seeds in pots to observe the change in nature).

Also, the children seemed to have really enjoyed visits from outsiders of the school (Susana and Dina) expressing their appreciation often.

Some concluding remarks:

1. **To best focus on the three axes of the project** (climate change and environmental awareness, digital education, and collaborative critical thinking skills) **it might help to select to focus on them in turn as to make sure that there is interconnection.** For example: focus on showing google earth and have the dialogue and environmental awareness present without excessive focus; then use the previous experience of watching google earth to have a dialogue about how to take care of the planet and build on how a tool as google earth could help, then a following session returning to google earth with specific items taken from previous dialogue to show how dialogue modifies the way one can explore google earth.
2. In what concerns climate change and environmental awareness, the children in this school in Lisbon seem very much aware of the correct behaviours to adopt, but it is not clear if they understand (and if they can understand) the reasons underlying this need and urgency. Importantly, **it requires evaluating how one can establish a distinction between making others aware and forcing others to hold certain beliefs** (indoctrination which does not promote critical analysis) which opens a topic for a future philosophical reflection on Ethics and Education to be taken up by the team (as was already mentioned in the meeting at Maribor). Though this is mainly a theoretical research issue which is beyond the scope of the project, it might be a way to disseminate the project outputs showing how theory and practice are inevitably intertwined.
3. **Drawing can be taken up as a tool for thinking which allows children to express when they find it hard to express their points of view verbally,** and when one reaches a moment in which no more reasons can be given. So, it seems important to use it to think

	<p>collaboratively. Perhaps, these activities can adopt drawing regularly and equip children to use images to modify images mimicking the critical thinking move.</p> <p>4. It will be important to revise the portfolio material in light of these insights and generally reinforce how drawing can be used as an inclusive activity to integrate those who are less prone to talk and participate.</p> <p>5. With the 5 years old the continuity between the sessions was quite visible for the children who referred to previous sessions without being prompted, which meant they related the learning experience undergone. While in the 4 years old dialogue was still very much a goal to achieve, in the 5 years old it was part of the process and it was possible to deepen collaborative thinking with reason giving and listening to other people's perspectives.</p> <p>6. Behaviour of children also changed in the playground revealing they were more careful with the common space (cleaning garbage when there was some left out of the bins, and asking to sweep the playground). Simultaneously, they revealed more care and attention to nature, to animals and to the planet and took these issues to their own families.</p>
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2. COLLABORATIVE KNOWLEDGE-BUILDING PROCESS

2.1 OBSERVATION

2.1 OBSERVATION	
<p>1. How have the children participated? How (if) has their participation changed throughout the sessions?</p>	<p>Yes, but participation was not always the same. One effect of P4C methodology is to provide an environment in which people who normally do not verbalize reveal their ability to participate intelligently in an activity. And this was visible and noted by the kindergarten and in one of the sessions where the teacher shared as Rita was surprised on how this person participated often and spoke so well in a session.</p>
<p>2. What was the role and the activities of the adult/guide/facilitator?</p>	<p>By selecting an activity from the portfolio, the facilitator would design the best way to present it to the children given what had happened. The facilitator varied and thus the approach also changed but the children themselves made sure there was dialogue and listen to those who have more difficulty expressing themselves.</p>

	Even though there are always some children who are more vocal than others the facilitators helped children to share their thoughts offering moments in which everyone participated and gave their input.
3. If different from the practitioner, what role did the class teacher play?	Often the kindergarten teachers helped children’s behaviour for them to be able to focus on session subject matter either by direct verbal suggestions, or by using the referring to the common practice in the classroom.
2.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS	
1. What <u>fostered</u> the collaborative-participative process? Which were the factors impacting on social, critical thinking and meta-cognitive skills?	<ul style="list-style-type: none"> – Facilitator asking children to consider what another child had said, avoiding answering for the children when a puzzle appears for the children often wait to hear the answer given by the adult figure and when it doesn’t happen, they feel encourage to revise the process and experience and provide their own answers. – Doing different things also seemed to promote questions. – The enthusiasm of the facilitator when hearing a philosophical idea or reasoning from the children allowed the community of inquiry to dive in the P4C skills and created moments to pause and think/explore what has been said.
2. What might have <u>hindered</u> the collaborative-participative process?	Even though all children were within the 5-year-old bracket it was also visible in the dialogue that some children were more capable of expressing themselves with words and the variation in ability is a very important part of philosophical dialogue and needed more ongoing sessions to reinforce the collaborative participatory process.

3. ENVIRONMENTAL AND CLIMATE-CHANGE CHALLENGES

3.1 OBSERVATION	
1. Have children generated a shared knowledge about environmental issues? What was the process?	Yes, the focus on nature in the ten sessions and the activities they experienced made them much more aware of bugs in the playground and they wanted to digitally record the life they saw like they hadn’t done before. Conversations also seemed to highlight the importance of experience and observation in experience.

3.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

<p>1. What fostered children's environmental awareness and the promotion of their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>The activities which help them verbalize what they already knew about taking care of the environment. Fostering environmental awareness is now an ongoing concern of schools, and very present in the school we worked at. This means the subject in itself was not new.</p>
<p>2. What might have hindered children's environmental awareness and their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>After saying all the things (recycling, helping others, taking care of planet, etc.) the children (5 years old was very visible) did not know what else they could do, and the observer felt both kindergarten teachers and children were trying to find other things to name for promoting the active role and could not say more than what they had been told before the project. It might be useful to know ahead of time what has already been done regarding environmental awareness as to engage in deepening their understanding of the issues they already know.</p>

4. DIGITAL TECHNOLOGIES

4.1 OBSERVATION

<p>1. How have children used Digital Technologies?</p>	<p>The children took pictures with digital cameras (or phones and I-pads), explored as a group Google earth, looked at the photos they took in a powerpoint presentation on the big screen of the class (that was visibly important in all classes), and had several discussions prompted by digital power point presentation of images.</p>
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4.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

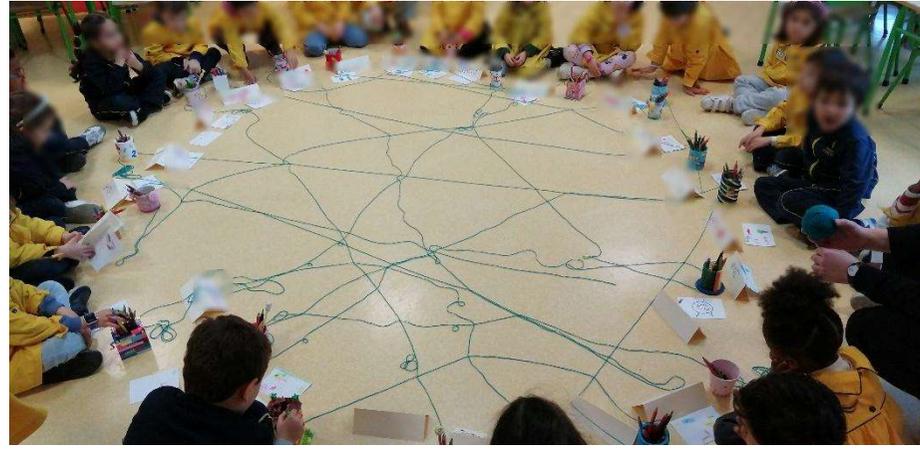
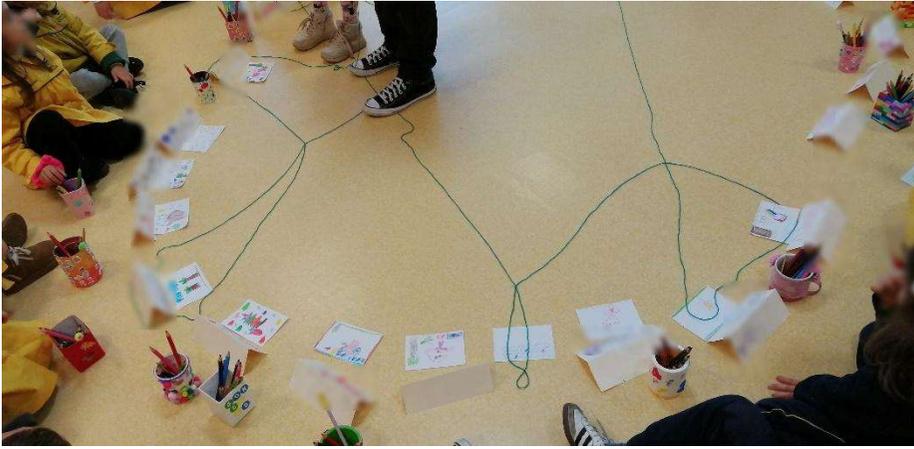
<p>1. What fostered a critical approach to digital technologies?</p>	<ul style="list-style-type: none"> - Comparing analogue with digital and direct experience (planting seeds, reading a book about seeds and flowers, seeing a time lapse of seed turn into plant/fruit) ALSO comparing seeing from above (experience) and seeing from above with google earth. - Drawing after digital tool collective experience. - Moments of dialogue after digital. - Asking "Why?" And highlighting the importance of giving reasons - Common focus to have the dialogue (powerpoint on needs and wants)
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2. What might have hindered a critical approach to digital technologies?

Too much information. Sometimes the digital experience had so much information for the children that it made it difficult for them to engage in any kind of conversation and often they asked to draw when they realized it was also a possibility.

Also, **each session focused on a new item of the portfolio.** Even though there was an effort not to rush and some tasks of the portfolio took up two sessions, **exploring the material in the portfolio showed that ten sessions are too short to promote a durable critical stance for digital technologies.**

PICTURES







**EACH - Early
Childhood and
Sustainable
Citizenship Routes**



EDUCATIONAL EXPERIENCES NARRATIVE REPORT

School name and location:	Be Montessori preschool Beskidzka, Gdansk (Poland)
Number of groups:	2
Number of children involved:	40
Age range:	4-5-6 years old
Term:	January – April 2025

1. BACKGROUND: contextual information and educational approaches

Brief description of the project (general purpose/objectives, number and dates of the meetings, timeline, proposed activities, starting points for discussion selected in each of the meetings, etc.)

The EACH project aimed to foster critical thinking through collaborative practices while introducing digital technologies in the classroom by focusing on climate change issues and environmental awareness more generally. The project was **implemented in a Montessori kindergarten, which brings a distinctive pedagogical approach rooted in child autonomy, sensorial exploration, and a prepared environment designed to support self-directed learning**. The Montessori method emphasizes deep respect for the child's thinking processes, encourages freedom within limits, and values observation and reflection, making it particularly receptive to practices such as philosophical dialogue and critical collaboration. In this kindergarten, the EACH project was carried out in three different mixed-age classes. This narrative summary refers to 2 groups of children.

Observations took place between **24th January and 15th April 2025**, conducted by **Emilia, Julia, Zuzanna, and Paweł** and they were supervised by **Jarek**. The sessions were facilitated by members of the kindergarten team and **visiting collaborators**, based on a flexible plan responsive to the children's interests and reactions.

Ten weekly sessions were conducted, each lasting between 60 to 90 minutes in each of the three mixed age groups (3/6-year-old). These sessions were led by kindergarten teachers. The sessions were structured around the Philosophy for Children (P4C) methodology, which was well-aligned with the Montessori environment. **The children were already accustomed to daily conversations and reflective pauses, and the philosophical prompts.**

Nevertheless, **while children could articulate environmental behaviours, they sometimes struggled to reflect on how to influence others beyond repeating familiar messages**. This suggests a need to include materials in the project portfolio that help bridge the gap between knowledge and action, particularly regarding environmental responsibility.

The presence of external observers was valued by the children, who expressed delight in seeing other people interested in their thinking. **The kindergarten staff also created a visual display for parents, showcasing the children's artwork and reflections**, while some activities (like caring for planted seeds, care for the environment, care for self) are part of the regular classroom routine in Montessori settings.

Concluding remarks:

1. **Montessori alignment.** The Montessori environment naturally supports many principles of the EACH project, including autonomy, sensory-based exploration, and reflective dialogue. Future iterations of the project in Montessori contexts might

	<p>benefit from deeper integration of Montessori materials with digital tools and philosophical inquiry.</p> <ol style="list-style-type: none"> 2. Thematic focus. To effectively integrate the three axes of the project – climate awareness, digital tools, and critical thinking – sessions should be designed to highlight one axe at a time, then build bridges between them in follow-up sessions. 3. Philosophical reflection. While children were familiar with environmental rules, helping them explore the ethical and philosophical reasons behind those rules could deepen their understanding and avoid rote repetition. 4. Drawing and exploratory talk as thinking. Exploratory talk and drawing emerged as a powerful medium for expressing reasoning and should be developed further in the portfolio. 5. Continuity and progression. All three groups demonstrated clear progression in collaborative thinking, referencing past experiences and showing care for shared spaces—both material (playground) and psycho-dynamic/social (dialogue). 6. Embedding the project. The Montessori staff's ongoing commitment to integrating the project into classroom life was essential. This sustained engagement enabled the project to have a broader, more lasting impact.
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2. COLLABORATIVE KNOWLEDGE-BUILDING PROCESS

2.1 OBSERVATION

<p>1. How have the children participated? How (if) has their participation changed throughout the sessions?</p>	<p>Across the 20 observed sessions, children engaged in multiple forms of collaborative knowledge construction characteristic of the Montessori and P4C approaches. Their participation was marked by:</p> <ul style="list-style-type: none"> ● Spontaneous Contributions and Peer Dialogue: children independently shared observations (e.g., “renifer – tlen”, “kwiaty – ziemia”), frequently reacting to each other’s ideas. Some children built on prior peer input, extending the range of natural connections identified. ● Shared Exploration: while individual children took turns using the camera, the group frequently observed and discussed findings together (e.g., animal tracks in snow, moss, or tree bark), promoting mutual curiosity and layered understandings. ● Embodied Learning in Nature: during the walk outdoors, children’s physical engagement with the environment (e.g., pointing, crouching, leading others to
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	<p>discoveries) supported distributed cognition — knowledge formed not in isolation, but through collective action in context.</p> <ul style="list-style-type: none"> ● Reflective Sharing: during the photo presentation, each child explained their photo and the “connection in nature” it represented. This invited shared reflection, re-interpretation, and validation of ideas in a community of peers. ● Emergent Inquiry: the presence of tentative statements (“może to lis”, “to jakieś inne tropy”) and correction upon closer inspection shows that children were not simply stating facts but actively constructing understanding, revising hypotheses with others. <p>Despite moments of distraction, the children consistently demonstrated autonomy in idea generation, collaborative verification, and meaning-making, even in an unstructured natural setting.</p>
<p>2. What was the role and the activities of the adult/guide/facilitator?</p>	<p>The adult played a facilitator-observer role, marked by the following characteristics:</p> <ul style="list-style-type: none"> ● Framing and Structuring the Inquiry. The guide provided an initial theme ("połączenia w naturze") and introduced the tools (phones/tablets), enabling a shared focus and purpose. ● Scaffolded Autonomy. The adult offered minimal but timely interventions – e.g., reminding about photo composition or asking clarifying questions ("jakie połączenie widzisz?") – without dominating children's exploration. ● Mediating Transitions. The guide organized transitions between activities (indoor discussion → going outs → group reflection), ensuring continuity of inquiry while respecting Montessori routines (circle time, songs, group flow). ● Responsive Support. The teacher responded to spontaneous observations by enabling access to tools, prompting with questions, or encouraging further inquiry. However, gaps were noted: at times, short or absent child responses were not followed by adult paraphrasing or elaboration, which may have limited deeper exploration. ● Creating Learning Conditions. The teacher ensured access to meaningful contexts (forest, classroom) where children could connect abstract ideas with sensory experiences, which is key in early childhood Montessori. <p>Overall, the adult operated more as a guide on the side (which is part and parcel of Montessori practice), enabling rather than directing, although with room for increased dialogic support in moments of low verbal engagement.</p>

<p>3. If different from the practitioner, what role did the class teacher play?</p>	<p>The teachers' roles included both pedagogical and organizational dimensions:</p> <ul style="list-style-type: none"> ● Observation and Documentation. Teachers carefully observed children's verbal and non-verbal cues, monitored engagement, and made adjustments (e.g., switching from projector to laptop for better visibility). ● Tool Mediation. They managed the technical aspects of the activity, ensuring children could use phones/tablets for documentation. They instructed on practical use (e.g., zoom function, focus) when needed. ● Environmental Coordination. Teachers led the group safely through indoor and outdoor spaces, maintaining order (e.g., lining up in pairs, supervision in the forest) without interrupting the flow of discovery. ● Translating Observations into Dialogue. Teachers facilitated the final reflective session by projecting children's photos and prompting questions aimed at critical thinking (e.g., "czy trzeba było używać zbliżeń?", "czy owoce są tylko dla zwierząt?"). However, these moments occasionally lacked sustained dialogue or revoicing to support emergent thinking further. ● Providing Materials and Emotional Support. In line with Montessori values, teachers ensured materials were available (e.g., prepared tablets) and created a psychologically safe space for children to explore without fear of being wrong. <p>Occasional changes of teachers did not disrupt the group, suggesting consistent routines and a shared understanding of goals among staff. Nonetheless, stronger pedagogical strategies for deepening emergent ideas (e.g., paraphrasing, extending vocabulary, encouraging peer dialogue) could enhance collaborative knowledge outcomes.</p>
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2.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

<p>1. What fostered the collaborative-participative process? Which were the factors impacting on social, critical thinking and meta-cognitive skills?</p>	<p>The collaborative-participative process among the children in the Montessori setting was fostered by a combination of tactile engagement, open-ended material use, freedom of movement, and an emotionally safe atmosphere where spontaneous exploration was encouraged.</p> <p>A key enabler was the invitation to use large-format sketching and shared materials placed directly on the floor. This physical setup supported natural collaboration — multiple children could gather around a surface at once, comment on each other's ideas, and make joint decisions (e.g., when a child said, "Let's draw it here" and others adjusted accordingly). This spatial arrangement removed hierarchical roles and promoted equal participation.</p> <p>Social skills were evident in how children negotiated space and turn-taking without adult prompting. For example, in one group, the girl who initiated the drawing paused when</p>
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	<p>another child wanted to add something; the shift of control was smooth, and the children continued to build on each other’s ideas, not just their own.</p> <p>Meta-cognitive development was visible in the way children reflected on their process out loud. A child who was documenting the group’s steps said, “First we built it and then we changed it because it was too flat,” showing emerging awareness of iterative work and cause-effect reasoning.</p> <p>Critical thinking surfaced when the children evaluated their constructions or drawings against the imagined needs of others. For instance, a boy testing the sensory quality of a material said, “Close your eyes and touch it — can you guess what it is?” This showed early design empathy and problem framing.</p> <p>The emotional tone also played a vital role. Children often laughed together during prototyping, made silly mistakes without embarrassment, and invited each other to “try it out.” This sense of psychological safety and joy supported risk-taking, openness to feedback, and willingness to adapt.</p> <p>In sum, what fostered collaboration was not formal planning or adult-guided division of labour, but rather the Montessori-prepared environment, which offered freedom within structure, rich sensorial materials, shared physical space, and time — all of which allowed children’s social, critical, and meta-cognitive skills to emerge in a natural, integrated way.</p>
<p>2. What might have <u>hindered</u> the collaborative-participative process?</p>	<p>Despite the overall success of the collaboration, some factors impeded full participation. Unequal distribution of roles occurred in some groups, where one person took over (e.g., “the one who draws”) while others became passive observers. In these cases, group dynamics shifted from co-construction to delegation, limiting the potential for shared learning and engagement.</p> <p>Difficulty in translating ideas across disciplines also caused tension. For instance, pedagogy students sometimes lacked confidence in sketching or explaining spatial designs, while design students struggled to articulate the educational rationale behind certain choices. This led to communication breakdowns and occasionally, disengagement.</p> <p>Moreover, some students hesitated to intervene in group processes, even when they had doubts about the chosen solution. This reluctance – whether due to politeness, insecurity, or time pressure – prevented richer discussion and limited the group’s ability to reflect critically on its work.</p> <p>Finally, time constraints and product-oriented pressure occasionally led to premature closure: rather than questioning assumptions or rethinking ideas, students opted to “stick with what we have” in order to move forward. This curtailed deeper collaborative reflection and reduced the space for meta-cognitive engagement.</p>

3. ENVIRONMENTAL AND CLIMATE-CHANGE CHALLENGES

3.1 OBSERVATION

1. Have children generated a **shared knowledge about environmental issues**? What was the **process**?

Yes, the children began to generate shared knowledge about environmental issues, though in ways that were **sensory, embodied, and rooted in imaginative, experiential learning rather than verbal abstraction**. The process was **non-linear, dialogic, and material-based**, consistent with Montessori principles.

The shared knowledge developed not through formal teaching, but through **collaborative storytelling, prototyping, and problem-solving** that referenced environmental ideas — often symbolically. For instance, in several observations, children included **trees, clean water, shelters for animals, and spaces for rest** in their designs, indicating a basic awareness of human and non-human needs in a healthy environment.

One child said, “Let’s make a place where it’s always green,” and another added, “With birds that are not scared.” These expressions reflect **early ecological thinking**, framed in relational and affective terms: nature as a place of safety, beauty, and coexistence. This knowledge was not delivered or instructed but **emerged from peer interactions** and the shared project goal of designing for others (imagined guests, animals, etc.).

The **process of sharing knowledge** happened in **micro-interactions**: when one child mentioned “a river that is clean”, others added “fish can swim in it” or “no garbage there.” In these moments, concepts like pollution or ecosystem health were **co-constructed and reinforced through play and peer affirmation**.

Materials also played a mediating role. When children chose to use natural textures (e.g., leaves, blue paper for water), they often attached meaning to them: “This is to make it feel like a forest” or “This is for recycling.” Thus, **material choices were infused with symbolic environmental meaning**, and children collectively interpreted and expanded on each other’s ideas.

Importantly, the **climate change themes emerged in child-sized ways** – through the lens of care, comfort, fairness, and sensory experience, rather than abstract data. For example, when a child commented that their design had “a roof so the sun doesn’t burn you,” it reflected an intuitive connection to climate concerns such as heat and protection.

In sum, shared knowledge about environmental issues was **co-created through embodied design tasks, symbolic material use, and emotionally resonant dialogue**. The Montessori

setting enabled this by allowing open-ended expression, peer exchange, and time for ideas to surface, connect, and evolve organically.

3.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

1. What fostered children's environmental awareness and the promotion of their active role in addressing climate change issues and promoting environmental sustainability?

Children’s environmental awareness and their emergent sense of agency in addressing climate-related issues were fostered by **three interconnected factors** in the Montessori design project:

1. Embodied and sensory engagement with materials and spaces

Environmental awareness emerged as children engaged **physically and imaginatively** with materials representing natural elements — such as water (blue paper, flowing lines), forests (leaves, sticks), or animals and humans in need of safe spaces. Through this hands-on process, they didn't just talk about the environment; they **built it, shaped it, and cared for it**. For instance, the idea of designing a place where people “can breathe” or “don’t get hot” came from tactile engagement with shelters, trees, and shade-making features. These design decisions **materialized ecological thinking**, turning abstract concerns into tangible actions.

2. Perspective-taking and social imagination

The task to design a space “for others” – including imagined people, animals, or guests – fostered **empathy and care**, which are foundational to environmental ethics. One group decided, “We need a place for the birds to eat”, while another added “and a quiet place for tired people”. These moments revealed how the **social dimension of sustainability** was internalized through cooperative design; children took on the responsibility to **provide comfort, safety, and harmony with nature**. This imaginative perspective-taking built the foundation for an **active and relational role** in environmental stewardship.

3. A prepared Montessori environment that allowed freedom, dialogue, and sustained focus

The **Montessori environment**, with its emphasis on autonomy, uninterrupted work cycles, and meaningful materials, created space for **slow thinking, deep focus, and shared meaning-making**. No adult imposed environmental messages; instead, **children discovered them through self-chosen collaboration**, negotiating ideas and reflecting them in their models. This nurtured a **sense of ownership** over the design and, by extension, over the idea of caring for the environment. The teacher’s role as observer and gentle guide ensured that children’s ideas were **taken seriously**, reinforcing their sense of agency.

In sum, children’s awareness and emerging agency around environmental sustainability were fostered by **sensorial-material exploration, affective connections with others, and**

	<p>the pedagogical freedom to explore environmental themes through their own language and logic. This bottom-up, embodied process aligns with both Montessori principles and contemporary approaches to early climate education.</p>
<p>2. What might have hindered children's environmental awareness and their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>While the Montessori design project created many opportunities for children to engage with environmental ideas, several subtle factors may have limited the depth or clarity of their awareness and agency in relation to climate change:</p> <ol style="list-style-type: none"> 1. Lack of explicit environmental language and connections Although children expressed concern for others and designed spaces with natural elements, their language rarely included explicit references to environmental issues such as pollution, global warming, etc. The absence of specific vocabulary or guided reflection around the causes and consequences of environmental degradation might have limited their ability to connect their intuitive actions with broader ecological systems. For example, children designed shelters and green areas, but without linking these choices to heat, carbon, or ecosystem balance, the climate-related meaning remained implicit. 2. Fragmentation of ideas across groups Each small group worked on separate models, and while they sometimes exchanged ideas, there was no collective integration of their designs into a shared vision or discussion of environmental impact at a larger scale. This might have hindered the development of a shared ecological narrative or an understanding of how individual actions connect to systemic change — a key component of environmental sustainability thinking. 3. Limited exposure to real-world environmental issues The children's ideas emerged entirely from imaginative and play-based design. While powerful, this process lacked a direct link to real-world environmental experiences or provocations (e.g., stories, photos, or natural phenomena). Without anchoring the design in real challenges or local environmental concerns, children's sense of urgency or responsibility for actual change might remain abstract. 4. Potential adult hesitation to name or frame climate issues Given Montessori's emphasis on child-led discovery, educators may have avoided introducing specific environmental problems too early or too directly. While this protects children's autonomy, it might also result in missed opportunities to gently scaffold awareness of climate change in age-appropriate ways — through storytelling, nature walks, or shared reflection on how their models relate to the Earth's well-being.

4. DIGITAL TECHNOLOGIES

4.1 OBSERVATION

1. How have children used Digital Technologies?

In the observed Montessori environment, digital technology was used as an *extension of the sensorial and experiential curriculum*. Children employed a **digital voice recorder** (a smartphone with a dictation function) to collect environmental sounds during an outdoor exploration. This use was purposeful, self-directed, and embedded in real-world experience (key attributes of Montessori practice, where materials and tools are chosen to serve developmentally appropriate, meaningful activities).

The recording device served as a “*material*” in the Montessori sense, not a toy or entertainment object, but a tool that supports exploration, classification, and representation. Much like the sound boxes or bells used in the Montessori classroom to refine auditory discrimination, the digital recorder allowed children to attune to subtle sound variations, revisit them, and use them for reflection and creative expression. Importantly, the technology was not the focus of attention—it remained *invisible in function*, subordinate to the children’s interest in the environment.

Younger children (ages 3–4)

Digital tools were **rarely used directly** by the youngest children. However, they **engaged with outcomes** produced through technology, such as:

- Watching photos of their group’s designs taken by adults or older peers, which helped **reinforce memory and narrative** about their own actions.
- Viewing short video clips that replayed their work, fostering **emotional connection and recognition** of their contributions.

Older children (ages 5–6)

Older children sometimes used tablets or digital cameras, **with adult guidance**, to:

- **Take photos** of group constructions (e.g., models of sustainable houses, gardens, or animal shelters), fostering **ownership and reflection**.
- **Record short videos or voice messages** explaining their ideas, which supported **language development and communicative confidence**.
- In a few cases, **search for images** (e.g., of trees, compost bins, or green roofs) with adult help, to **expand their design vocabulary**.

	<p>Digital technology was therefore used as a scaffold – introduced selectively, with clear boundaries, and always in service of the children’s real-world inquiry into climate and sustainability topics. This approach aligns with Montessori principles: prioritizing hands-on, sensorial learning while opening small, guided windows to digital tools that amplify children's ability to express, revisit, and share their ideas.</p>
4.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS	
<p>1. What fostered a critical approach to digital technologies?</p>	<p>Several conditions consistent with Montessori principles supported a critical engagement with digital tools:</p> <ol style="list-style-type: none"> 1. Prepared environment and freedom of choice. The outdoor setting was intentionally chosen as an environment rich in sensory stimuli. Children were free to select which sounds to record, thus exercising <i>freedom within limits</i>, a central Montessori tenet that nurtures responsibility and thoughtful decision-making. 2. Integration of reflection and expression. After recording, the children engaged in <i>conscious processing</i> of their experience, discussing the emotional qualities of the sounds, expressing preferences, and creating visual representations. This aligns with Montessori’s emphasis on <i>inner work</i>, where experience is internalized and given personal meaning. 3. Guidance, not instruction. The adult acted as a <i>silent observer and facilitator</i>, offering minimal direction. This pedagogical stance fosters autonomy and critical thinking, as children are invited to formulate their own questions, rather than absorb ready-made interpretations. 4. Use of real, functioning tools. In Montessori environments, children use real instruments (not pretend ones) to perform real tasks. Using a digital recorder for a concrete purpose mirrored this principle and helped demystify technology, positioning it as <i>a neutral tool to be evaluated based on its purpose and effect</i>, not its novelty.
<p>2. What might have hindered a critical approach to digital technologies?</p>	<p>Some elements, although consistent with Montessori philosophy, may have inadvertently limited deeper critical engagement:</p> <ol style="list-style-type: none"> 1. Minimal focus on the <i>mechanics</i> of technology. Montessori materials are usually self-correcting and manipulable. In this case, the smartphone (though used thoughtfully) may not have offered children opportunities to understand how it functions or to explore its affordances. Without tactile engagement or problem-solving challenges, critical awareness of the tool itself remains superficial. 2. Lack of iterative engagement. In a Montessori classroom, children revisit materials over time to deepen their understanding. A one-time use of digital technology, even

when meaningful, may not be sufficient to support *critical literacy*. Repetition and variation are essential for reflection and metacognitive growth.

3. **Adult control of access.** Montessori practice emphasizes *child-sized, accessible environments*. If the device was held or operated primarily by the adult, it could restrict children's sense of ownership and exploration, subtly reinforcing dependence or limiting experimentation.
4. **Potential novelty effect.** Although the activity was grounded in real-world inquiry, the presence of a digital device could have introduced a *novelty bias*, especially if children are unaccustomed to such tools in their Montessori setting. This might hinder criticality if children are more captivated by the medium than the message.

PICTURES





**EACH - Early
Childhood and
Sustainable
Citizenship Routes**



EDUCATIONAL EXPERIENCES NARRATIVE REPORT

School name and location:	Leśna baza Be Montessori Wilczek (Poland)
Number of groups:	1
Number of children involved:	14
Age range:	4-5-6 years old
Term:	February – March 2025

1. BACKGROUND: contextual information and educational approaches

Brief description of the project (general purpose/objectives, number and dates of the meetings, timeline, proposed activities, starting points for discussion selected in each of the meetings, etc.)

The EACH project aims to cultivate critical thinking and environmental awareness through collaborative practices, including the thoughtful introduction of digital tools in early childhood education. This iteration of the project was implemented in a **forest-based Montessori kindergarten**, where nature itself constitutes a core element of the learning environment. Sessions were facilitated interchangeably by four educators – Agata, Paweł, Łucja, and Natalia – and took place both outdoors and in semi-open settings like yurts. Observations were conducted by Emilia, Julia, Alicja, Kaja and Olga and they were supervised by Jarek.

From **February 4th to March 28th, 2025**, children participated in activities structured around Philosophy for Children (P4C), environmental inquiry, and multimodal expression. **Limited internet access in the forest setting further encouraged an emphasis on sensorial engagement, and interpersonal dialogue.** The Montessori philosophy of freedom within structure, hands-on learning, and deep respect for the child's autonomy was naturally aligned with the EACH project's principles.

The sessions often began with open dialogue in a circle format and were followed by collaborative explorations outdoors or creative expression indoors. Across multiple themes – ranging from "Nature Detectives" to "My Favourite Tree" and "Symphony of Nature" – children developed observational and reflective skills through drawing, photography, digital sound recording, and philosophical discussion.

Concluding Remarks:

1. **Montessori alignment.** The Montessori environment naturally supports many principles of the EACH project, including autonomy, sensory-based exploration, and reflective dialogue. Future iterations of the project in Montessori contexts might benefit from deeper integration of Montessori materials with digital tools and philosophical inquiry.
2. **Thematic focus.** To effectively integrate the three axes of the project – climate awareness, digital tools, and critical thinking – sessions should be designed to highlight one axe at a time, then build bridges between them in follow-up sessions.
3. **Philosophical reflection.** While children were familiar with environmental rules, helping them explore the ethical and philosophical reasons behind those rules could deepen their understanding and avoid rote repetition.

	<p>4. Drawing and exploratory talk as thinking. Exploratory talk and drawing emerged as a powerful medium for expressing reasoning and should be developed further in the portfolio.</p> <p>5. Forest environment. This preschool group is based on outdoor education. Daily contact with nature increases environmental awareness and may lead to emotional involvement in environmental issues.</p> <p>The forest Montessori environment provided a unique and fertile ground for the EACH project, blending freedom, ecological immersion, and reflective practices. The children’s learning was deeply rooted in sensory experience, imaginative dialogue, and authentic interaction with nature. Future iterations of the project in such settings might benefit from:</p> <ul style="list-style-type: none"> – Greater continuity in digital tools use to build technological confidence. – More structured strategies for deepening philosophical discussions in open-air contexts. – Integration of real-world environmental provocations (e.g., storytelling, nature events) to anchor abstract concepts. <p>The forest preschool team demonstrated adaptability and dedication, and the children’s progression in collaborative reasoning, environmental ethics, and creative expression revealed the transformative potential of combining Montessori education with EACH’s triad: critical thinking, climate awareness, and digital literacy.</p>
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2. COLLABORATIVE KNOWLEDGE-BUILDING PROCESS

2.1 OBSERVATION

<p>1. How have the children participated? How (if) has their participation changed throughout the sessions?</p>	<p>Children's participation was marked by vivid engagement, curiosity, and peer responsiveness. The natural environment provided a rich stimulus for inquiry and dialogue. For example, during the session, children eagerly identified interdependencies in nature (e.g., “pinecone – seed,” “gellyfish-water,” “cloud – sun”) and documented these using mobile devices. Their reasoning evolved from intuitive associations to more layered reflections, especially during group discussions and photo presentations.</p> <p>Children displayed increasing confidence in leading inquiries, negotiating shared interpretations (e.g., animal tracks in the snow), and revising hypotheses when confronted with new evidence (“not a boar, maybe a fox ... look at the claws!”). The photographic component enabled children to revisit and reflect on their ideas, helping them bridge experience with abstract thought.</p>
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	<p>In collaborative art sessions, such as recreating “my favourite tree” from photographs, children not only practiced observation and detail reproduction but also explored aesthetic, personal, and ecological dimensions of nature. They discussed differences between photo and drawing, as well as subjectivity in representation, laying a foundation for critical literacy.</p>
<p>2. What was the role and the activities of the adult/guide/facilitator?</p>	<p>Adults maintained a facilitator-observer role, consistent with Montessori principles. They introduced themes, structured transitions, and enabled access to tools and materials, while generally refraining from imposing interpretations. When children hesitated or showed emotional responses (e.g., sadness about not having their sound recording played), educators responded with sensitivity and supported children’s emotional regulation. Facilitators encouraged philosophical questioning (“Can a tree be a friend?”, “What happens when the environment changes?”) and created moments for peer-led dialogue. However, moments of distraction or behavioral intensity highlighted the need for stronger strategies to sustain reflective attention in open-air settings, particularly during longer circle discussions.</p>
<p>3. If different from the practitioner, what role did the class teacher play?</p>	<p>The teachers’ roles included both pedagogical and organizational dimensions:</p> <ul style="list-style-type: none"> – Tool Mediation. They managed the technical aspects of the activity, ensuring children could use phones/tablets for documentation. They instructed on practical use when needed. – Environmental Coordination. Teachers led the group safely through indoor and outdoor spaces, maintaining order (e.g., supervision in the forest) without interrupting the flow of discovery. – Providing Materials and Emotional Support. In line with Montessori principles, teachers ensured materials were available and created a psychologically safe space for children to explore without fear of being wrong.
<p>2.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS</p>	
<p>1. What <u>fostered</u> the collaborative-participative process? Which were the factors impacting on social, critical thinking and meta-cognitive skills?</p>	<ul style="list-style-type: none"> – Embodied learning in nature. Walking, exploring, and engaging physically with materials (e.g., touching tree bark, recording bird sounds, collecting seeds) supported collective sense-making and co-regulation. – Freedom of expression. Children were encouraged to choose their methods of documentation (drawing, photographing, or recording) enhancing autonomy and investment.

	<ul style="list-style-type: none"> – Relational dynamics. Trusting adult-child relationships and a non-judgmental atmosphere enabled children to express themselves freely, including through singing, storytelling, and play-acting needs or desires (e.g., in improvised advertisements about hunger). – Philosophical grounding: Thought-provoking questions – especially during sessions on needs, desires, and environmental interdependence – helped children explore both concrete and abstract reasoning.
<p>2. What might have <u>hindered</u> the collaborative-participative process?</p>	<ul style="list-style-type: none"> – Attention regulation in open settings. Natural distractions and the fluidity of forest spaces occasionally reduced sustained verbal engagement. This underscores the importance of balancing structure with openness, especially during reflective activities. – Digital tool constraints. Limited repetition with devices like tablets and sound recorders may have reduced opportunities for deeper critical engagement or mastery. – Emotional and social dynamics. Occasional peer conflicts or disengagement (e.g., children wandering during circle time) suggest a need for adaptive pacing and more varied modes of participation, particularly for younger or more kinaesthetic learners.

3. ENVIRONMENTAL AND CLIMATE-CHANGE CHALLENGES

3.1 OBSERVATION	
<p>1. Have children generated a shared knowledge about environmental issues? What was the process?</p>	<p>Yes, children generated shared knowledge about environmental issues through embodied and emotionally resonant exploration. Their understanding emerged not through abstract instruction but through symbolic associations and sensory experiences during walks in the forest, dialogic circles, and artistic activities. Children discussed the value of trees for animals and humans (“trees give oxygen, we couldn’t live without them”), imagined deforested landscapes, and emotionally connected with trees as “friends”. These insights, though child-sized and metaphorical, reveal early ecological reasoning and care-based ethics.</p> <p>They built knowledge collaboratively, such as when co-constructing interpretations of animal tracks or environmental sounds, deepening each other's ideas by layering observations (“That might be a fox—not a boar—look at the claws!”). Visual and sound-based documentation helped children revisit and refine their thinking.</p>

3.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

<p>1. What fostered children's environmental awareness and the promotion of their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>1. Immersive natural environment Learning occurred outdoors, among trees and animals, reinforcing the reality and relevance of nature. Children observed interdependencies firsthand (e.g., seeds, habitats, shelter), nurturing a relational perspective.</p> <p>2. Personal emotional investment Children expressed care and affection toward nature, often describing trees as comforting or protective. The story of a woman living in a redwood tree for two years sparked wonder and reinforced nature protection as an act of dedication.</p> <p>3. Material-symbolic learning By creating artworks and photo-based representations of trees, animal tracks, or forest soundscapes, children developed ecological sensibility through creative expression. Their choices were emotionally meaningful and fostered agency (“I want to show that this tree is special”).</p>
<p>2. What might have hindered children's environmental awareness and their active role in addressing climate change issues and promoting environmental sustainability?</p>	<p>1. Implicit rather than explicit connections While children discussed nature with care, references to pollution, climate change, or sustainability were rare unless introduced by adults. There was limited use of environmental vocabulary.</p> <p>2. Individual focus Activities were often child-led and individual (e.g., choosing a favourite tree), with less emphasis on systemic or collective environmental action. This may have limited the understanding of broader climate dynamics.</p> <p>3. Lack of real-world provocations Children were not regularly exposed to concrete climate-related challenges (e.g., drought, trash accumulation, endangered species). This may have constrained the development of cause-effect reasoning around environmental issues.</p>

4. DIGITAL TECHNOLOGIES

4.1 OBSERVATION

1. How have children used **Digital Technologies**?

Digital tools were used in a developmentally appropriate, Montessori-consistent way, embedded into children’s real-world exploration rather than being the center of attention. Children took photographs of nature interconnections, recorded environmental sounds, and used those recordings as stimuli for drawing and discussion. Older children independently used mobile phones or tablets with guidance; younger ones observed and reflected on outcomes. For example, during “Nature Detectives”, they used the zoom to inspect details; during “Symphony of Nature”, they listened to and interpreted soundscapes they had helped record. These engagements strengthened memory, encouraged reflection, and supported multimodal learning without overwhelming the child-led ethos of the forest setting.

4.2 EVALUATION: GOOD PRACTICES AND CRITICAL FACTORS

1. What fostered a critical approach to digital technologies?



1. **Purposeful use of tools.** Digital devices were framed as tools for **discovery, not entertainment**. This aligned with Montessori principles and emphasized function over novelty (e.g., “zooming in to see claw marks”).
2. **Sensory integration and reflection.** Activities combined digital tools with bodily and artistic engagement; recordings were revisited through drawing, discussion, and sensory description (e.g., “What did you feel when you heard it?”).
3. **Child autonomy and control.** Children chose when and what to record or photograph, and their interpretations were valued. This empowered ownership and self-regulation in technology use.

2. What might have hindered a critical approach to digital technologies?

1. **Limited access and repetition.** Due to environmental constraints (forest, poor signal), devices were used briefly and inconsistently. This hindered children’s ability to develop deeper technological literacy.
2. **Adult-controlled interactions.** Adults often initiated or mediated tool use, which may have limited spontaneous, exploratory engagement—especially among younger children.
3. **Focus on content over medium.** While children engaged with what was captured (photos, sounds), there was little discussion of how technology works or its broader implications. **Opportunities for media literacy were missed.**