



Mariateresa Cairo

Department of Pedagogy | Catholic University of Sacre Heart | Milan – ITALY | maria.cairo@unicatt.it

Elena Gatti

Support Teacher | Piacenza – ITALY | gatti.elena.75@gmail.com

Giorgia Pera

Dog- trainer III Level | Piacenza – ITALY | giorgiapera75@gmail.com

Emotional and Social Skills in Primary School pupils, Resilience and Love for nature: a Psycho-pedagogical Approach

Competenze emotive e sociali negli alunni della scuola primaria, resilienza e amore per la natura: un approccio psicopedagogico

Fuori Call

The project *My mate is green... and yours 'has a tail'!* was implemented in four primary schools with eleven-year-old children (the total number of children enrolled in the project is 42, including 5 pupils with IEP – Individualized Educational Plan - and 5 pupils with PDP – Personalized Didactic Plan-). The children participated in Outdoor Education activities for five hours a week during 2021/2022 school year. Agricultural activities in the school premises and the presence of a dog inside the classroom created special atmosphere during the learning process. The methodology of mediated learning was used to improve knowledge, emotional and social skills and meta-reflection on ecological issues (e.g., climate change). The aim of the project was to improve biophilia, empathy with nature and social skills among classmates. The teachers' diaries were used to collect qualitative data on the children's social, cognitive and emotional growth during the back-to-school period after Covid-19.

Keyword: Outdoor Education, resilience, emotional education, school, science curricula.

Il progetto *Il mio compagno è verde... e il tuo "ha la coda"!* è stato realizzato in quattro scuole primarie con bambini di undici anni (il numero totale di bambini iscritti al progetto è di 42, compresi 5 alunni con PEI - Piano Educativo Individualizzato - e 5 alunni con PDP - Piano Didattico Personalizzato -). I bambini hanno partecipato a attività di Outdoor Education per cinque ore alla settimana durante l'anno scolastico 2021/2022. Le attività agricole nei locali della scuola e la presenza di un cane in classe hanno creato un'atmosfera speciale durante il processo di apprendimento. La metodologia dell'apprendimento mediato è stata utilizzata per migliorare le conoscenze, le competenze emotive e sociali e la meta-riflessione sulle questioni ecologiche (ad esempio, il cambiamento climatico). L'obiettivo del progetto era quello di migliorare la biofilia, l'empatia con la natura e le abilità sociali fra compagni di classe. I diari degli insegnanti sono stati utilizzati per raccogliere dati qualitativi sulla crescita sociale, cognitiva ed emotiva dei bambini durante il periodo di ritorno alla scuola dopo la pandemia Covid-19.

Parole chiave: Outdoor Education, resilienza, educazione emotiva, scuola, curriculum di scienze.

OPEN ACCESS Double blind peer review

How to cite this article: Cairo, M., Gatti, E. & Pera, G. (2024). Emotional and Social Skills in Primary School pupils, Resilience and Love for nature: a Psycho-pedagogical Approach. *Italian Journal of Special Education for Inclusion*, XII, 2, 231-242. <https://doi.org/10.7346/sipes-02-2024-20>

Corresponding Author: Mariateresa Cairo | maria.cairo@unicatt.it

Received: 13/07/2024 | **Accepted:** 17/12/2024 | **Published:** 30/12/2024

Italian Journal of Special Education for Inclusion | © Pensa MultiMedia®
ISSN 2282-6041 (on line) | DOI: 10.7346/sipes-02-2024-20



Introduction

Fauna and flora are two important factors in children's life experience. Educational literature has observed that pupils feel more comfortable outdoors, sitting on the lawn, leaning against a tree trunk, rather than confined to a desk with closed doors and windows. Recently some researches (Louv, 2008; Oliviero, Oliviero Ferraris, 2011; Mugnai, 2014; Marchesini, 2016; Scarcella et al., 2019; Fine, 2024) state that the relationship with plants, animals and natural environments has a beneficial and antistress effect for adult people and children. The Louv's hypothesis is that the increase of school difficulties and disabilities – such as ADHD, behavioural and emotional problems, phobias - physic and motor problems – such as obesity, asthma, allergies, myopia – link with a progressive loss of natural experiences.

Gray (2013) identifies seven 'sins' of the school: denial of children freedom, denial of children commitment and autodetermination, denial of intrinsic motivation, realization of external and summative evaluation without student involvement, denial of collaboration and growing of bullying, inhibition of creative thinking, standardization of learning abilities and competencies. In alternative, Gray proposes the importance of playing and the connection with natural environment to create a better mood in the school and to improve communication, socialization and respect for every single person.

Attending school is cause of stress for some pupils. The school demands performances and outcomes and some pupils, because of emotional or cognitive immaturity or social and economic causes, aren't ready to cope with these challenges successfully. Especially primary school teachers must have a lot of patience. Outdoor Education and the Animal assisted intervention have beneficial effects on the emotional and interpersonal situations of a group or a single child (Cairo, Milani, 2020; Mignosi, 2023; Persico et al., 2024; Giunti, Schenetti, 2024).

Since 1970s the Italian school system has included students from kindergarten to university level. The choice regarding disabled pupils was made thanks to the development of special education, but also SEN pupils' inclusive culture, policy and practices. The inclusion is possible because teachers in schools develop different methods, methodologies and learning and communicative strategies to teach (i.e. frontal lessons, cooperative learning and researches, experiments and exploration methodology, use of technologies and AI...) and didactic tools for mediated learning (tactile, visual, verbal, concrete experiences, analogical instruments – i.e. role playing and virtual simulation –). This heterogeneity of practices permits to match the curricula programme with the accumulated knowledge, abilities and thinking strategies of students to improve their competences and their professional attitudes at young age. A lot of work has been done, but it is necessary to go on with the commitment.

Survey Question

The aim of school is to give knowledge, skills and 'mental habitus' useful to children who will become adults, citizens and workers. A teacher's goal is to build a safe environment in which children's mental health is protected.

The leading questions of the project *My mate is green...and yours 'has a tail'!* are: can a relationship with nature and the animals improve children's social, emotional and communication skills? Does the relationship with nature (flora and fauna) promote human resilience? What is the benefit of attending school with this type of education?

The UN 2030 Agenda for Sustainable Development emphasises environmental education through activities such as observing, using five senses, collecting data, classifying, and learning about the environment. These objectives and methodologies should be complemented by the activities that develop *biophilia* and *natural intelligence* in children (Gardner, 2009; Malavasi, 2024), which are necessary to deal with climate change, environmental crisis and personal resilience in the future.



Literature Review

Research emphasises that a good relationship between the human being and the natural world (One Health) enhances individual biophilia, understood as a love of life towards everything that is positive, vital and constructive for a good mind-body balance (Kaplan, Kaplan, 1989; Beetz, 2013; Melchiori, Barzotti., 2018; Cairo, Milani, 2020). The ability to feel good with yourself is connected to the natural environment and promotes ecological thinking and action, which focuses on defending the Planet, the common home for human beings, plants and animals. The defence of the natural ecosystems goes hand in hand with the defence of human ecosystems, first and foremost the family; the construction of an anthropic and technological environment must not be dehumanising, but inclusive and sustainable. The younger generation must be educated with a biocentric approach and essential lifestyle. Direct, thoughtful, and repeated contact between children, plants and animals has many benefits: personal well-being, development of life skills, and teaching-learning process.

Nature and animal contact can improve in the students:

- **emotional development:** schools are often a performative environment for students, causing stress and anxiety. The interaction with nature and animals can have positive physical effects, due to the reduction of cortisol and the creation of a better relational and emotional climate among classmates. After some minutes of sensorial, visual or olfactory stimulation in a natural and/or artistic (aesthetically beautiful) place our brain produces substances which decrease stress and improve the mental and motor functioning. Living or walking in beautiful natural or artistic places has psychological effects: it enhances spiritual wellness, reduces anxiety, benefits calmness, auto control and self-esteem (Chawla, 2020; Friedman et al., 2021; Largo, Wight et al., 2018). These effects are confirmed especially for children with disability and the sick. The self-esteem and trust are important factors for the emotional wellbeing and academic success (Correale et al., 2017; Dicé et al., 2017; Meints et al., 2022; Scandurra et al., 2021)
- **social development:** learning by activities in nature reduces the ADHD, increase sympathy among classmates and finalizes communication between pupil and teacher, improves the attention and concentration, reduces the aggressive behaviour towards themselves and others (included plants, animals and human beings). The presence of animals requires respect of behavioural rules, self-regulation and auto-control. These effects have been noticed also in SEN students. Most frequently the children have egocentric behaviour which can be overcome with the development of kindness, empathy and pro-social skills (Juríčková et al., 2020; Verhoeven et al., 2023). The Outdoor Education improves linguistic and not verbal communication, the socialization among classroom mates and the interpersonal abilities. Staying outdoors, especially in natural parks, gardens, agricultural fields and woods give psychological benefits as improving work memory and creative thinking (which seems to be improved of 50%) (Heras et al., 2020; Kiviranta et al., 2023). The benefits of plants for stress decrease were also confirmed (Larson et al., 2021; Rios, Menezes, 2017).
- **cognitive development:** the environment can be observed from a scientific point of view, studying things, animals and plants and natural phenomena (i.e., weather, water, biological and physical processes, natural disasters etc...). The contact with real world permits to understand situations and problems which otherwise could be too abstract (Kong, Chen, 2024). Kaplan and Kaplan (1989) state that outdoor education can restore attention because nature is full of interesting stimulations which do not stress human mental faculties, but improve concentration, memory and rational reasoning (i.e. moderating risk and decision making). In order to be restoring the environment should be beautiful and far from confusion and the chaotic atmosphere of towns (Maxera, Alvarez-Blanco, 2022). Some researchers observed dog-reading activities in the classroom and in outdoor context. In this situation the “tendency for individual to engage in and enjoy thinking” improves (Ngai et al., 2021). The presence of a dog during reading and writing lessons improves cognitive skills especially the attention to words structure, the respect of punctuation and the motivation. The dog doesn’t judge the students during



their performance and lets them self-regulate the pace of their learning (Le Roux et al., 2014; Kirnan et al., 2016; Kirnan et al., 2018; Wohlfarth et al., 2014);

- **motor development:** living in external contexts, children have different postures and make more movements than they do in the classroom. This gets their physical and mental health better. The contact with nature, practicing an outdoor sport, walking, using the bicycle every day develop motor agility, prevent obesity and promote a more active lifestyle (Hanscom, Louv, 2016). The presence of animals in the school improves students' behaviour and engagement in activities. The relax and the absence of fear promote postural changes, locomotion, verbal and non-verbal communication and the closeness among students, teachers and animals, reduce stereotypies and repetitive movements (Solé et al., 2023).

Method

Participants

The children involved in the experience were 86, but only 42 participated in the activities of the project *My mate is green... and yours has a tail!*

10 children with SEN participated in the Project.

Contest

The pupils involved in the research attended the last year of Primary school (11 years old) and the research was carried out after school lockdown due to Covid – 19. The children attended on line lessons for some months (distance learning). After returning to school teachers had to work on interpersonal relationships, communication and socialization skills and pay particular attention to emotional wellbeing among classmates.

Activities and Best Practice: Nature and Technologies

In the post-Covid 19 period, teachers decided to start a project aimed at promoting biophilia and empathy through the relationship with nature. The activities were:

- plantation and cultivation of plants in the school garden;
- breeding and taking care of small animals in the classroom (some caterpillars, a gecko, a great tit bird, a European hedgehog...);
- construction of a herbarium;
- study of insects and other small animals, which were living in the school garden;
- cleaning of a park near the school (recycling, collection of dried leaves...);
- invention of stories about animals and plants;
- reading in the garden;
- presence of a dog in the classroom;
- dog training lessons (ethological habits, feeding, nonverbal communication...);
- taking walks.

Families have been involved in the project with several meetings in which children's activities have been explained to parents.

The methodologies that have been used more frequently were: cooperative group among classmates (i.e., researches with books, dictionaries and encyclopaedias about natural science subjects, surveys and essays reported on papers hanging on the walls of the class or posted on the virtual space of the school, podcasts etc.), active lessons in the garden of the school with the teachers, active learning with exploration and discovery of ecological experiences and video production, tutoring between children during writing and reading.



The stimulation of dialogue and free expression of emotions have been an effective experience to reinforce the friendship and cope with post Covid-19 stress situations. Choosing to stay in the garden or in the park during the lessons has been a good solution to children's motor needs and emotional support against isolation and depression.

Nature can become a way to understand technology better and also the technology can help with better understanding of the nature. The use of simple media such as camera and video camera can help to explore the human life, the nature and the habitats: particular events or phenomena can be videorecorded for interest or curiosity. The film or the photographs can be used to remember life situations functioning as media tools between external and internal experience for the children. The correct use of media offers many advantages. The fine and gross motricity is engaged during the shooting.

Technology has been introduced to the children and their families in a gradual way, starting with the technological instruments required during lockdown. At first the parents' mediation was fundamental but, after returning to class, the teachers spent time and energy to promote greater autonomy in the use of technology. The instruments proposed first were shared platforms such as *Google Classroom*; they had little interaction and were easy to access, they were mostly a storage for contents (garden care, walking in the woods, data collection about animals growing...). Afterwards, through active teaching, group work and Episodes of Situated Learning some technological mediators and STEAM were introduced. The ones such as *padlet*, *Google Slides*, *Google Modules*, *Mentimeter*, *Learning App* were used to promote cooperation among students and to allow them to manage active lessons by themselves. During the lessons electronic microscopes and magnifying lenses were used to enhance and enrich learning activities. Other instruments such as video and audio recorders or *podcast* microphones were used to improve data collections process and skills for deep analysis. The use of instruments and technological items allowed children to think about better applications of technology. Different types of technology have been used to give greater autonomy to students as well as freedom of movement, cooperation and experimentation even for the kids who showed more difficulties taking part in traditional learning methods. They obtained a task and a positive role with the classmates, so that also their self-esteem and effectiveness were improved. These children could communicate with the *padlet* and other platforms in written form, the 'formal' absence of the teacher gave them greater freedom in using the tools, greater desire for debate and communication with classmates through reciprocal stimulation. They felt that giving an answer to a classmate was more interesting and 'immediate' than finishing a writing essay in their notebooks. The children could listen to their classmates recording the lessons, that meant further development process and strengthening their competences.

The group activities, exchanges and conversations among the children while using digital instruments have always been approved. The children showed reciprocal support, transferring into this new environment of the acquired life skills. It is worth noting that group building had already been started during the first years of the primary school and it was reinforced during lockdown. Also, the direct knowledge of the interesting subjects on social platforms probably inhibited those anti-social behaviours that can be found in this environment even between kids and pre-teens.

Effects on the teaching-learning process

During the project teachers collected data using:

- daily observation diaries;
- sharing a *padlet* with the children in order to promote participation and creative writing;
- video and photographs made by pupils and discussed in the class;
- self-evaluation models of the educational project.

At the end of the project the children were interviewed by the teachers. They were asked what emotions and thoughts they experienced during scientific and naturalistic activities. The interviews were video recorded. The researchers listened to them several times and it turned out that:



- the shyest children spoke about their experience, showing a willingness to open up and expand their interpersonal relationships;
- all the children spoke about their emotions, demonstrating a greater desire to adapt to school life;
- all the children learned the importance of respecting nature and animals;
- all the children found analogies between respect for nature and animals and respect for human beings;
- no one showed refusal towards the proposed experiences;
- children with bullying problems decreased their antisocial behaviour towards both classmates and teachers;
- many children at the end of primary school in the following two years returned to help manage the school garden, go for walks with the dogs and ask for advice and help from teachers.

Especially, the teachers and the supervisor evaluated the learning and emotional progress of ten students with Individual Support Plan (to compensate their disabilities with additional supports) and Personalized Didactic Plan (to promote personal motivation and school attendance with a closer teacher-child relationship).

We reported some brief considerations for every child:

F. (a 11-year-old girl, 5th year primary school, student with IEP): she is Muslim girl from Morocco. In 2nd year she refused to go to school and stopped the relationship with her Italian classmates. Now she has difficulties learning the core curriculum of the primary school, speaks very little Italian and has a low self-esteem. She is described as an unmotivated and lazy child. Since 4th year she has had the IEP and the support teacher for 11 hours a week. The situation of this child, due to drawback in social and cultural learning system, result in a bad knowledge of Italian. The best solution should have been linguistic mediation and additional supports for learning Italian. The project *My mate is green... and yours 'has a tail'!* has given F. the possibility to be involved in a non-competitive experience and in real or informal situations. During the project she played with the dog and with the other children inside and outside the class, doing some exercise of long and brief memory on ethological information and behavioural rules with animals. She participated in some ecological activities including interviews which ended with a Podcasting about the importance of cleaning parks. She searched for participation, self - esteem and relationship with her classmates. During a history lesson about 'Roman Empire' in the school garden, she actively participated in the discussion: this open and positive role in the class activities would have been unthinkable and unexpected few months ago. She has been really ready to communicate with other classmates and to collaborate in autonomous way.

After finishing primary school, she is now attending the 1st year of middle secondary school, but she often goes back to primary school to tutor the younger children in garden activities.

S. (11-year-old boy, 5th year primary school, student with IEP): he arrived from India and has some difficulties with Italian. Every year he did not attend school in January and February to go back to India with his family. He is shy and introverted, but while the dog was in the classroom and during the walks, he opened up and started searching the relationship with his mates and the dog. Generally, he uses very little words, and looks for constructive interaction and clear messages (i.e., he improvised himself video maker during a long walk and he participated more and more frequently in the lessons with verbal contributions).

During the first year of middle secondary school S. participates to some AAI as a tutor for the new classmates, speaking about his experience in primary school and showing his competence with the animal despite having verbal difficulties in Italian.

He still has a relationship with the old classmates from primary school: the group of children who are keeping friendship and the path of mutual help and support. The project *My mate is green... and yours 'has a tail'!* and its activities haven't only been a contingent and an occasional experience, but the con-



tribution to building of deep and meaningful relationship. S. often writes messages to his primary school teachers.

A. (11-year-old boy, 5th year primary school student with IEP). A. is an Italian student who is very close shy and fearful towards other people. During the project he didn't want to be touched and didn't like to work in the garden with pet animals. During the project he was wary towards the activities which he considered to be useless and harmful. Only during a walk with the dog, he started to speak with a girl mate expressing emotions of fear and worries for the future.

He lives in a socially and economically disadvantaged family. He doesn't act in an aggressive way, but by the dog was present he often used the word 'gang' to name the group of classmates.

At the end of the school year, he accepted to go to the middle secondary school. On the first day of the new school, he brought with him the dog Pan, the mascot of the project *My mate is green... and yours 'has a tail'!* After this, he didn't return to visit the primary school and the teachers.

C. (11-year-old boy, NAI student (Neo Arrivati in Italia), 5th year primary school student with PDP). The student started to learn Italian as a second language. He is creative and talented in art but, in post pandemic month he used a mask to protect himself while speaking with others mates. He showed lack of confidence and a low self-esteem. Despite this behaviour, he was collaborative in the game situation. He liked to be engaged during the activities with the dog (i.e., feeding, sleep and rewards). He started to joke with the classmates in Italian during the activities in the park with a dog.

During the first year in the middle secondary school C. participated to some animal assisted interventions as a tutor for new classmates, speaking about his experience in primary school even if new teachers told us he rarely spoke during the formal situations (i.e., answering questions during the lessons, cooperative work etc...)

After eighteen months from finishing primary school, he went back to school to help the teachers with new little children at primary school. He had a role as an assistant during their science lessons and laboratories. He was involved in the project *Dirty, crap and other monsters* helping the teacher during the lessons in the garden and sweeping or cleaning the classroom after school.

T. (11-year-old girl, 5th year primary school student with PDP). T. is an introvert and shy child. She has some problems to learn core curricula. She speaks very little and only with some girl mates, selected by her. She speaks in a very low voice and she behaves passively. She shows lack of confidence and a low self-esteem. She attended primary school starting from the 1st year, but only during the project *My mate is green... and yours 'has a tail'!* in 5th year her mates and teachers learned that she had a dog. During the same year her classmates showed to be supportive and friendly to her socially and emotionally. The knowledge and the awareness of post Covid situation led to reflection about the problem of isolation and loneliness. The children's attitude of solidarity and comprehension in the presence of animals developed empathy and compassion. During active games with the dog the children developed curiosity and pro-social skills.

M. (11-years-old girl, 5th primary school student with IEP). M. has a mild cognitive disability and his very shy and introverted. She has difficulties writing and reading and participates very little in class life. The presence of a dog as a mediated 'tool' improved her involvement in school activities and motivated her to study. During the project she collaborated organize the games with classmates assisted by a dog (i.e., she brought the ball, the mat and the bowl for the dog). The main goal has always been to improve her self-esteem. During the game activities in the park, she silently observed her classmates.

O. (11-year-old boy, 5th primary school student with IEP). He has ADHD. He didn't like to go to school: he used to arrive in front of the building and he didn't go to join the classroom. One day, the teacher persuaded him to enter the school inventing a story about the dog: that it couldn't enter without being



accompanied by a child. O. understood the joke but he accepted to go to school with the dog on a leash. Thanks to the relationship with the animals, he started to be close to his classmates.

G. (11-year-old girl, 5th primary school student with PDP). She is a gypsy child, who lived in a nomad camp in the town. She is a friend of V. (another female SEN student), who helped with warmth and care. The teacher tried to improve her communicative and language skills during conversations in classroom and in the garden. The goal was achieved when she accepted to make a video about the trees in the winter explaining seasons changes to classmates. She talked about the beauty and love for nature in the video. To make the video, she used her knowledge and skills in photography and cinema, which she had learned during some lessons. She got a big satisfaction from this commitment, so she decided to take care of the school garden during the spring, obtaining a positive role among her classmates.

I. (11-year-old girl, 5th primary school student with PDP). She is an Egyptian child who attended the 1st year irregularly. She learned to speak Italian but she is not able to read and study. She lived in a traditional Muslim family; her mother didn't speak Italian and I. was the youngest of three children. She had two older brothers. She needed some stimulation to participate in positive experiences because she lived in a situation of isolation and marginalization. During the project *My mate is green... and yours 'has a tail'!* she was among her classmates, near the other children to observe what was going on. In the 5th year she still didn't speak Italian. She was absent from school for a month because she went to Egypt with her family. On the last school day, she promised to keep in touch with the teacher, but she didn't.

P. (11-year-old boy, 5th primary school student with PDP). He is an Egyptian child who was enrolled in 5th class. During the first months, he was diagnosed with childhood diabetes. He attended primary school irregularly, due to frequent journeys to Egypt (his mother lost her husband and came to Italy with three children). He had big difficulties learning Italian, having very low self-esteem. He had social and verbal communication problems with his classmates. The teachers hoped that the presence of a dog could be useful to promote relationship and communication among children. For P. the project had the goal to improve self-esteem and self-efficiency. The teacher stimulated P. to help a child with cognitive disability. The two classmates started a friendship which led to work together with other mates in the garden (i.e., collect leaves, digging etc...).

Discussion

Outdoor Education is a different way to teach: learning performance and students' needs are made up through environmental experiences which connect the internal (individual – emotional, cognitive factors...) and external (contextual – social, material, motor factors...) dimensions. The external dimensions were created by the students in places such as gardens, parks, woods, towns reaching even very far and not usual places. The internal dimensions are children's emotions and thoughts (Birbes, 2018; Bortolotti, 2019; Grindheim et al., 2021; Chistolini, 2022).

The qualitative nature of the experiment provides some suggestions on the importance to empower empathy and biophilia in eleven-year-old children, who will be future adults and citizens. It is conceivable that *green skills* such as biophilia, empathy and *healthy lifestyle* will be needed to face ecological challenges in the future. We think in the future it is useful to improve the ecological intelligence of children, the respect for every living creature and the emotional leadership (take care the human and natural resources), the emotional and social intelligence, the creativity at school and at work, the curiosity for life events. These are for sure some human qualities and green skills for the future. Some simple activities that can be realised to bring the nature in the classroom are:



- walking: which permits to observe the nature and to discover the deep dimension of human mind. For children, walking is a strong sensorial stimulation and an opportunity to know new things and to collect information. Thinking and walking are two experiences which put together psychological and physical wellbeing. Walking is a moment of tranquillity and freedom from the engagements and obligations of daily life, such as school can be for children and jobs for adults;
- open place and slow pace: the children need slow pace, the empty and silent places which the nature offers. Daily life is full of scheduled activities. The children's time is full of activities, especially at home where television, devices, sports and other activities are decided by parents. The empty spaces in nature are represented by open and free spaces, not structured, but full of possibilities which increase children's creativity and the desire to work together. Children have to reorganize themselves in these situations: this is non-directed education, but indirect monitoring and mediated education;
- playing: it is important to offer to child sensory stimulations, playing and healthy activities. The natural deficit disorder can be cured with a frequent, pleasant and relaxing contact with nature: running in a lawn, petting an animal, breathing clean air, playing hide and seek, climbing trees, doing orienting experiences and learning by doing;
- speaking: we are conscious that the children we spoke about in this article would have needed of a cultural and linguistic support at school and out of the school. Every child love animal and the relaxing experiences, but they are 'at risk of a cumulative deficit' in abilities and knowledge, due to their insufficient language performance.

Covid-19 permitted a new way to teach: the benefit of Outdoor Learning and Outdoor Education are important for the physical and psychological wellbeing of children. In the future at school there must be more freedom, commitment and responsibility, motivation, self-evaluation and etero-evaluation, creativity, collaboration and curiosity. These are skills to improve not only in pupils but also in teachers. Nature builds an 'holding environment' and the presence of animals is a cognitive mediator among adults and young students. Today, the pupils need to learn and to create trust in relationships, to develop critical and creative thinking, that allows them to have roots and to improve physical and mental health.

We hope that these experiences in schools will be more frequent. The problem is the discontinuity of the projects, often limited to trips in the country to visit a farm or a natural park, without resuming the topic and the experience in classroom during the teaching of core curricula.

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