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Kindergarten and sustainability in the light of the outdoor education paradigm

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Abstract.

Research on environmental sustainability is enriched by the new paradigm of outdoor education pioneered in kindergarten. The growing interest in outdoor education, as an educational model in Italian schools, is a call to make in-depth studies and research on forms for achieving a renewed teaching proposal. Teachers and parents are choosing a path, along which children learn in an outdoor milieu in direct contact with nature, animals and daily life outside the classroom. The idea, according to which this way of educating is truly respectful of the growth needs of infancy, is becoming a widespread conviction. Reflecting on some empirical data leads us to rethink the pedagogical and didactic soundness of educating on the lawn, in the forest and at sea. We are presenting the initial results that relate to the advancements of children who have spent a scholastic year in a school without walls and we discuss the cultural impact of this model.

Keywords: early childhood; experimental learning; Forest school; pedagogy; teacher training

1. Introduction

Over the course of the scholastic year 2018-2019, an initial exploratory inquiry was done in three municipal outdoor kindergartens located in District XIII of Rome, Italy. Their names are Legno Verde/Green-Wood, Luna Sapiente/Wise Moon, and Vittorio Alfieri, the last one is the name of a famous Italian poet.

The scientific monitoring of the three schools/kindergartens was conducted by the Università degli Studi Roma Tre with the aim of investigating and collecting the results that could confirm the pedagogical and didactic validity of the outdoor education model, in terms of child development and environmental sustainability.

During the first autumn meeting of 2018, in which representatives of the District, Schools, Associations and University participated, it was agreed that the lack of monitoring and evaluating the results obtained by outdoor education rendered the great works the teachers had been doing for years both disconnected and unmethodical. Work under the floodlights of multimedia dissemination and on the Net, but rather peripheral in the attention paid by the scientific community.

The inquiry was carried out from September 2018 until June 2019 through the preparation of various data collection tools intended to monitor and present the results of some schools of outdoor education. District XIII of Rome is an especially relevant zone from the standpoint of

the commitment of teachers and parents, who, since 2014, have been fully sharing the educational model of outdoor education in differentiated forms of classroom and curriculum management in after school environments. The participation of the District represents the political investment in the project.

2. The scientific classification of the inquiry

The first step necessary to start-up scientific monitoring of the new outdoor education model is represented by the Deed of Understanding dated 18 June 2018, with the purpose of the "Agreement as per Art. 15 of Law no. 241/1990 between District XIII Roma Aurelio and the Department of Sciences of Education, Università degli Studi Roma Tre, for sharing, promoting and disclosing the Outdoor Education Project in school structures standing in the municipal territory".

What is compiled here concerns the scientific work agreed to, in a general form and broad terms, by the District, teachers and University, through the reference people i.e. politicians, administrators, teachers, researchers.

The results of this study, still partial and presented here in summary form, pertaining on the monitoring, formalisation and conception of the data collection tools, and processing of the evaluations of the learning abilities and skills acquired by the children as proof of the positivity of the outdoor education model. Previous studies in the same field are dealing with the benefit of outdoor education in terms of knowledge, respect, awareness, understanding of the natural environment, with the learning of significant values and behaviours for the growth of the individual, the group, the community (**Smith et al., 1963; Schenetti et al., 2015; Wishart & Rouse, 2019).**

The necessity of District XIII to give scientific weight to the choice of school and social policy focusing on the new educational model and could not but positively involve University Roma Tre that has been working on this issue for years, including the promotion of conference and teacher-training projects.

The latter represents one of the highest priorities of the Department of Sciences of Education within the aims of the Terza Missione (Third Mission) meant for the collaboration and interaction with institutions for cultural and social promotion, operating in the territory. Hence the actions for sharing scientific culture.

3. Sample of the schools selected

The school involved in the monitoring process use the designation "Outdoor Education", in two cases, and the designation "Forest School", in one case. In total, the agreement was to study 7 sections, equivalent to 7 classes of children aged 3 to 5, with the participation of 7 teachers collecting daily data on children behaviour and development in learning outdoor.

The outdoor school Green-Wood is scheduling the activity, starting from September, for the entire school composed of four sections, with children aged 3-4-5 in one section each and one mixed section with children aged 3-4-5 together. Green Wood educates by taking the children to the VoloAlto Natural Park Educational Farm Onlus Association, whichrganises

workshop activities and hosts children in a vast area with facilities and the presence of plants and animals, from dog to eagle, from ostrich to parrot, from hen to rabbit.

Starting from September, the Forest School Wise Moon is taking two sections of children, aged 4 and 5, to the Natural Monument of Park of the Cellulosa, called CREA, Committee for Research in Agriculture and the Analysis of Agrarian Economy, Forests and Wood Research Centre and collaborating with the Legambiente Onlus Association.

Starting from March, the outdoor school Vittorio Alfieri is taking one section of children to the Regional urban Park called "Il Pineto", the Pine Wood, availing itself of the workshops made available by the Volo Alto Natural Park, which, for the occasion, is going to "Il Pineto", situated between District XIII and XIV of Rome, near the school.

4. Methodological framework

The inquiry is exploratory and makes use of a two-fold methodology of both a qualitative and quantitative nature, the reference basis being fields of experience at nursery and pre-schools, the methods that specify them and the response of children to the education being offered by teachers and educators. The response indicates the learning achieved three times during the survey: at the beginning of the process (September), halfway through the process (January) and upon completion of the process (June). For the qualitative part, the teachers related their findings, describing the longitudinal learning of the children; that is to say, over a one-year scholastic timespan.

The narrative of the culture of the school is associated with: the studies by Ovide Decroly and Amélie Hamaïde **(Decroly & Hamaïde, 1932)** on conditions that support the total integral growth of the child and appeals to create a school environment similar to nature, since the latter is more in keeping with the need for spontaneity and non-artificial behaviour of humankind; the studies by Jerome Seymour Bruner **(Bruner, 1996)** on the value of the creation of the identity and profound meaning contained in the personal experience narrated in an organised form and; the paradigm of the living pedagogy of Giuseppina Pizzigoni **(Pizzigoni, 1922)**, disciples of the experimental method actualised in recent research by Sandra Chistolini (**Chistolini, 2016**). Pizzigoni starts from the analysis of the life profile of the child; thereafter, the teachers following the method made evaluation tests of the learning attained through detailed classifications of the behaviour of children at school, from which relevant suggestions were derived for improving their teaching.

For the quantitative part, we refer to the evaluative assignment of the narrations, with acknowledgement of the intensity of each child's response to the pedagogical and teaching offer of the teacher. The four levels of the measurement scale, i.e. "a lot, fair, little, nothing", refer to the feedback intensity; i.e. "high, average, minimum, none", concerning the activity carried out at various times during the school year. The overall hypothesis is that a child starts at a minimum level, for intensity and frequency, at the beginning of the school year, then move on to an average level at mid-year and finally reach a high level at year's end. In June all children are expected to reach a full involvement and high level of participation in outdoor activities.

5. Data collection tools

The first tool agreed to with the teachers is the analysis of the fields of experience that represent the pedagogical and didactic soul of the nursery school. Through fields of experience, teachers schedule classroom activities and verify the overall growth trend of the children. So, we start from the fields of experience to highlight the learning of children, who participate in outdoor education and the Forest school. Our opening hypothesis is that the outdoor environment is an exceptional aid in the development of abilities and skills, to the point that pre-schools who have this opportunity demonstrate a peaceful, joyful way of living. The children learn about plants and animals, invent situations of communal life, observe the beauty of creation from life, are self-assured with the whole living world, learn to think and reflect under conditions of active interaction with people and the environment, overcome barriers of the classroom and enjoy a space that makes them fully free to move about and gain knowledge. The process of outdoor education generates enthusiasm in all the children, without exception, and appeals to the parents who end up being enthused with this educational model.

Starting from the fields of experience, we examine three important moments in the growth process of the children. The first moment is the entrance into the outdoor school or Forest School in the month of September. The second moment is in mid-year in the month of January. The third moment is at the year's end in the month of June.

Keeping the fields of experience unaltered as a basic reference, we defined a sample of six boys and girls, who could represent the configuration of the class group or section. Our hypothesis was to include a shy child, a restless child, an intelligent child, a less stimulated child, a child with behavioural and/or motor difficulties, a child with migratory experience or, should there not be this type of child, a child with mobility difficulty was chosen. This is a typology set up for the experiential purpose of verifying, whether educating outside the classroom can positively and radically influence the character of the child. The pilot typology is experimental in nature, is not thorough about to the school situation and represents an attempt to bring to light the validity of outdoor education for all children who participate in this educational model. It was presumed that the presence of children who reply to the defined typology can be found, in most cases, in one classroom.

6. Hypothesis, criteria and data collection

The team of the research agreed that it would be useful to extrapolate a critical typology and defer the definition of any other typologies to subsequent surveys if required. The general hypothesis starts from a basic question: in fact, we wonder if learning outdoors significantly helps the child who is:

- shy, by encouraging it to open up to the milieu and reduce its tendency to stay alone;
- restless, by guiding it to lessen its frenetic liveliness;
- intelligent, by offering occasions to expand their intellectual, emotional and psycho-physical resources;

- less stimulated, to find more and better opportunities for self-discovery, and that of others, the environment and life;
- affected with behavioural and/or motor difficulties, to feel supported and urged to do as much as possible to improve;
- affected by the migratory experience, to be appreciated and welcomed into the specific educational context.

The six criteria for the teachers in choosing the children are shyness; restlessness; intelligence; lack of stimulation; behavioural and/or motor difficulties; migratory experience or, should there be no such case, then consider a child with mobility difficulty. The choice of children respects sex equality, that is, three males and three females.

For purposes of evaluating the learning ability of the children a data collection grid was set up, in which the following identifying data were recorded: the school name, school year, section, age of the children, the five fields of experience of the nursery/pre-school with descriptive specifications. For each child in the sample group, the teachers write down what they detect regarding the activities proposed in five field of experience known as: body and movement; self and the other; images, sounds and colours; discussions and words; knowledge of the world. From September to June every teacher describes in words what they observe in the selected child, for the data collection. In July, the quantitative evaluation is dealt with, having the availability of the overall trend of development.

7. Analysis of the results

Reported in the specific grids are examples extrapolated from the transcriptions of the teachers over three data collection periods. In the description of a shy child, the teacher notes how the behaviour in September, January and June, as regards the first Field of Experience "Body and Movement", first specific method: "Knows how to control and coordinate movements with the others and use the natural materials available for composing paths of movement": "He/she is disoriented and indecisive" (Sept.-18) (Little); "He/she controls movement with the help of an adult" (Jan.-19) (Fair); "He/she is engaged and curious about the final results" (June-19) (A lot). The evaluation of the teacher concerns the child's ability to follow paths outside, through rocks and pieces of wood, and deal with crossings. The learning trend through outdoor experience rises decisively. By year's end, the shy child has gained self-confidence, is more self-assured and knows how to create a goal.

In the description of a restless child, the teacher writes about the second Field of Experience "Self and the other", second descriptive method "He/she takes care of living things and the environment, in which they live": "He/she rips off leaves and bothers the animals" (Sept.-18) (Nothing); "He/she does not bother the animals and respects the plants" (Jan.-19) (A lot); "He/she recognises that waste has a special collection place" (June-19) (A lot). In September, this child did not know how to relate well to plants and animals. In January, the restless child shows visible signs of improvement in the relationship with the natural environment. Year's end sees a steady positive learning ability to respect the environment that receives them.

In the description of an intelligent child, the teacher writes about the third Field of Experience "Images, sounds and colours", third descriptive method "He/she can recognise the characteristics of elements of nature and classify them": "yes" (A lot) (Oct.-18); "yes" (A lot) (Jan.-19); "yes" (A lot) (June-19). In this case, progressive trends are not recorded.

In the description of a less stimulated child, the teacher writes about the fourth Field of Experience "Discussions and words", fourth descriptive method "He/she knows how to narrate a short experience": lack of data collection during the three scheduled months, (Oct.-18) (Nothing), (Jan.-19) (Nothing), (June-19) (Nothing). In this case, the teacher does not record the exact development trends of the learning ability.

In the description of a child with behavioural difficulties, the teacher writes about the fourth Field of Experience "Discussions and words", fifth descriptive method "He/she memorises and repeats nursery rhymes and poetry": lack of data collection for Oct.-18 (Nothing) and Jan.-19 (Nothing), "Began" (June-19) (Little). The child begins to open up in June.

In the description of a child with migratory experience, the teacher writes about the fifth Field of Experience "Knowledge of the world", fifth descriptive method "He/she understands and differentiates sizes": "He/she understands sizes" (Oct. -18) (Little); "He/she understands sizes and differentiates, but the action is not accompanied by verbalisation" (Jan.-19) (Fair); "He/she understands sizes, differentiates between them and accompanies the action with verbalisation" (June-19) (A lot). The child starts from a fair standpoint and slowly progresses until reaching top performance.

8. Conclusions

From the analysis of learning abilities by the fields of experience specified, and through the descriptive methods of the global development we argue that, in the Outdoor School and the Forest School, the children pass from a stance of distance, indifference and sometimes hesitation towards the outside environment to one of active participation and living within an open context without walls. Those children, who participate less at the beginning of the outdoor education experience, reach a level of maturity of positive interaction at year's end, hereby relating to people, animals and things in a more independent, relaxed manner. There is notable growth in learning abilities in children who are participatory from the outset; they reach the ability to formulate complete thoughts that describe their outdoor experience quite well.

As an additional positive result of outdoor education, we would like to cite the visit of the class of 5-year-olds from Green-Wood to the palaeontological site of Polledrara di Cecanibbio: the elephant cemetery. After the visit, the children made a reconstruction of this site in the school garden. The visit to the site was carried out within the ARTIS Project: Accessibility Roma Tre, Technological Innovation, Sustainability of the University Roma Tre (**Chistolini, 2021**). The capacity to report the outdoor educational life of a child created new conditions of scientific and social communication between school, family and community. Moreover, it demonstrated the relevance of the preparatory scientific training of teachers for better evidence of the great commitment that Outdoor School and the Forest School entail in

all their forms of implementation. Outdoor learning requires a lot of work and only highly motivated teachers can bear the responsibility that comes with this teaching and learning paradigm.

Further investigations are planned to improve the comparison with school classes that do not practice outdoor education. This is necessary to better appreciate the benefits of outdoor education.

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