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THE "SCHOOL IN THE GREEN": AN EXPERIENCE OF DEVELOPING SCHOLASTIC INTELLIGENCE THROUGH THE ENHANCEMENT OF THE NATURALISTIC AND VISUAL-SPATIAL ONES

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ABSTRACT: *The "Cipolletti" Institute has launched, from the 2020-21 school year to today, in the summer months, the experience of the "School in the Green", located in a wood in the town of Banzano di Montoro (AV- Italy). It is a space equipped for the safety of kindergarten and primary school children, in which motor, artistic, and laboratory activities are carried out in English since the Institute is a bilingual school. The school, which has been using the "Embodied cognition" model for years, has intended to integrate "Embodied" learning, precisely "Embodied", with outdoor teaching, trying to develop, in parallel with scholastic intelligence, also naturalistic intelligence, and visual-spatial. Among the scientific assumptions is that of Waldpädagogik, of experiential pedagogy that values discovery learning. The project of the "School in the Green" was supervised by the Chair of Developmental and Educational Psychology of the Department of Medicine, Surgery, Dentistry "Scuola Medica Salernitana" of the University of Salerno (Italy), and the same Department sponsored the project. The activities carried out were: Study science directly through sensory experience in nature; Music and movement workshop with Orff instruments; Sensory and musical journey with handcrafted instruments; Motor paths and motor coordination to develop naturalistic intelligence and visual-spatial intelligence; Motor-sport activity in the greenery; Immersive learning of the English language; Peer tutoring for learning English; Small group activity in Spanish; Learning of less widespread languages with the 3D construction of morpho-phonemes (for example Korean, Portuguese); Theatrical activities in nature; Garden care; Workshop for flower arrangements; Outdoor cooking workshop¸local field trips. This short article reports the theoretical construct of reference and research to evaluate whether school learning activities benefit from being implemented in a naturalistic context.*

KEYWORDS: School in the Green, Developing Scholastic Intelligence, Naturalistic, Visual-Spatial Ones

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NATURALISTIC INTELLIGENCE IN GARDNER'S MODEL OF MULTIPLE INTELLIGENCES

As already anticipated, the model of Gardner's Theories of Multiple Intelligences was applied, which, on the one hand, explains the nature of the mind and its potential, and on the other, speaks to us of needs because every child has its way of learning that can privilege the use of a certain intelligence rather than another. Gardner speaks to educational responsibility because developing intelligence requires a certain environment and stimuli. The natural environment is thus the most favourable to the development of numerous bits of intelligence, such as bodily-kinesthetic intelligence and visual/spatial intelligence, and naturalistic intelligence. When children find themselves playing freely in a natural environment, in all seasons, free to accept its challenges and experience its adventure, they will soon find themselves coming to terms with their abilities and limits, with their own states' mood, intentions, expectations, desires, sense of self-worth; they will find themselves grappling with the need to develop certain self-discipline and to channel their emotions into socially acceptable forms and thus to develop their intrapersonal intelligence. Closely related to the perception of oneself is the perception of the other: thanks to interpersonal intelligence, the child learns to perceive and interpret the moods, motivations, intentions, and feelings of others, to refine verbal and non-verbal communication, to feel empathy, create synergy with others, show sensitivity to others' moods, feelings, temperaments, listen and understand others' perspectives, work cooperatively. Experience in nature is also the one that, more than any other, favours the development of naturalistic intelligence, an intelligence that our planet needs today more than ever to develop in human beings. Only by being in nature can the child experience a sense of communion with it, develop sensitivity, appreciation, and care for animal and plant species and learn to interact with them. Existential intelligence, the ultimate intelligence in temporal order, theorised by Gardner, refers to the ability to ask questions about the great existential problems, in particular, the dimensions that concern the meaning of life and death, the nature of man, questions that children begin to ask themselves from a very young age and which denote their ability to grasp the spiritual dimension of existence, especially where it manifests itself in its immensity, in the nature that surrounds us and of which we are a part[1].

Environmental education is one of the fundamental points of forest pedagogy. In forest schools, children learn about nature through their own experiences, thanks to the educators' knowledge. Here children can understand their being an integral part of the network of living things and thus develop an attitude of care and respect for the environment (Schenetti et al., 2015). Maria Montessori (1870-1952) often underlines in her writings the importance of children's relationship with nature; who need to experience it directly, not just know it in theory. The school must allow children to be in contact with nature to develop the "feeling of nature", that is, an attitude of care, respect, and curiosity toward all living things. Montessori also speaks of "cosmic education", that is, making known to children how our life is possible only thanks to the interdependent relationship that binds us to other creatures, for example, by observing small-scale ecosystems such as ponds[2].

[1] https://www.ecopedagogia.it/Howard%20Gardner

[2] https://thesis.unipd.it/handle/20.500.12608/41505

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Characteristics of naturalistic intelligence

According to Gardner, naturalistic intelligence is the ability to identify, classify and manipulate elements of the environment, objects, animals, or plants. Thanks to this type of intelligence, we can recognise the differences between species, groups of people, or objects and understand how they relate to each other.

Naturalistic intelligence is thought to have developed in early human times when survival depended on recognising useful and dangerous species, observing the climate, reading the land, and expanding the range of resources available to humans.

As a general rule, people with high naturalistic intelligence have the following characteristics:

- they express a desire to understand how things work;
- they care about the environment and love being in contact with nature;
- they are good at identifying fauna and flora;
- they enjoy exploring and discovering new species and behaviours;
- they are interested in using instruments such as microscopes, binoculars, and telescopes to aid observation.

In general, children with naturalistic intelligence show an inclination towards the natural world, as well as towards what humans have created. They go beyond superficial observations and want to go deeper and make inferences about how things work and their nature. They also tend to classify objects and sort them into categories.

Several activities can help a child develop their naturalistic intelligence, which can be grouped into:

- Contact: nature walks in the woods or mountains, camping, visits to zoos and aquariums, etc.
- Observation: once in contact with nature, to strengthen this type of intelligence it is important to observe the environment closely.
- Exploration: a magnifying glass, microscope, or binoculars help make the experience more interactive and fun.
- Classification: with the help of parents, books, or the Internet, the child must learn to classify what he finds. They can create a field diary with annotations and photos.
- Pastime: encourage the little ones to have hobbies such as planting seeds at home or collecting fossils, stones, leaves, etc.

If we take a look at the professions, we find people with higher naturalistic intelligence in fields such as chemistry, biology, zoology, botany, medicine, art, pharmaceutical, veterinary medicine, physics, etc.

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People with naturalistic intelligence have the following characteristics:

- Particular sensitivity towards nature, the environment, and living beings, which leads to recognising and classifying in detail the variety of the world around;
- they can distinguish many aspects and clues offered by the surrounding nature.
- Show a particular interest in natural phenomena, animals, and plants.

Regarding the animal and plant kingdoms, children with this type of intelligence express their desire to have pets and are fascinated by how plants grow. They enjoy exploring and discovering natural environments and other life forms and often enjoy observing details such as the behavior of pets, the flight of birds, or the activities of insects. It is also not uncommon to find them performing impromptu experiments[3].

A central element of Gardner's naturalistic intelligence is the ability to classify objects according to salient similarities and differences between them. This capability is critically involved in generating meaningful taxonomies of living and non-living objects. Thus, categorisation tasks of this kind would appear to be ideal measures of the naturalistic domain. It is worth noting that these tasks also appear to require a high level of logical reasoning, suggesting that the cognitive demands for this domain might be similar to those for Gardner's logical/mathematical intelligence, despite being applied to semantically significant stimuli, rather than the domain of symbolic and quantitative concepts[4].

Another method that has been shown in previous studies to develop naturalistic intelligence is the field trip method. This study aims to discover how the ecological field travel method can increase naturalistic intelligence in children. The ecological field trip method can be used to increase naturalistic intelligence in children. By doing this activity, children will be more familiar with the environment and will be conducive to caring for the environment[5].

The research

To evaluate whether school learning activities benefit from being implemented in a naturalistic context, we used seven activities proposed by Gardner (1988) [6]and Gardner and Hatch of 1989[7], inspired by the study by Almeida *et al*. (2010)[8].

To assess naturalistic and visual-spatial intelligence, we used two tasks: "Discovery" and "Why do some objects float and others sink?" In "Discovery", students are asked to play with different natural objects such as a feather, a stone, etc. They are asked to look for the differences and similarities between these objects and describe them in detail while focusing on their qualities. In "Why do some objects float and others sink?" teachers ask whether each object would float

[3] https://www.cgedu.it/collections/intelligence-naturalistica

[4] Visser, BA, Ashton, MC, & Vernon, PA (2006). Beyond g: Putting multiple intelligences theory to the test. *Intelligence , 34* (5), 487-502.

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or sink in a tub of water and why. Both tasks assess accurate observation (ability to pay attention to detail); identification of relationships (ability to establish causes and effects between facts, similarities and differences between objects and establish classifications); hypothesis formulation and testing (ability to think about problems, identify deficiencies and correct them using logical reasoning); experimentation (ability to manipulate objects and see different uses and possibilities to work with them); and the interest students show in activities related to their knowledge of the natural world and its storytelling. As can be seen, classically scholastic intelligences are also involved, such as linguistics and mathematics.

For each activity, the observers used a Likert scale (scores range from 1, or never expresses, to 4, or always expresses).

We interviewed No. 20 children aged between 6 and 11, attending the summer camp "The School in the Green" of the Cipolletti Institute, near Montoro (AV). They were interviewed at the end of the 3-month summer camp.

The headteacher, teachers, and parents authorised the study. The tests were administered during Woodland School hours, a pleasant and relaxed environment to encourage student performance.

Naturalistic (classification items) and visual-spatial intelligence had a high significance of task-solving success ($p < .01$) in the Gardner tasks. This means that school training implemented in a naturalistic context, the canonical learning experiences in unconventional contexts, such as naturalistic ones, and the relationship and constant experimentation with nature have had an impact on the student's scholastic learning performance.

CONCLUSIONS

Our brief study reinforces the conclusions reached by Soleimanpouromran and Ahmadimoghadam (2021), according to which the education and training system should have the capacity to foster naturalistic intelligence both inside and outside the classroom, not only to improve behaviours of respect for the environment and good relationships with nature but also to encourage the improvement of school skills[9].

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