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Maria Montessori and Embodied Education: current proposal in preschool education

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Abstract

The Montessorian proposal for childhood education appears highly modern and relevant in relation to the development of both motor skills and cognitive functions (Shivji, 2016), strongly supported by neurosciences' embodied theories (Roessingh & Bence, 2018), and the increasing wellbeing problem related to childhood (Pate et al., 2014; Ross, 2012). This review analyses Maria Montessori's modern educational vision, in light of the emerging needs of today's children. The contribution reviews existing literature focusing on body and movement, but connected with cognitive, emotional and well-being aspects, which are critical in preschool education, both for educators/teachers (Atli, 2016; Akkerman, 2014; Lillard, 2011), and for school reform policies (Lillard, 2019).

La proposta montessoriana per l'educazione dell'infanzia appare altamente moderna e rilevante in relazione allo sviluppo sia delle capacità motorie sia delle funzioni cognitive (Shivji, 2016), fortemente supportata dalle teorie incarnate delle neuroscienze (Roessingh & Bence, 2018), e dal crescente problema di benessere legato all'infanzia (Pate et al., 2014; Ross, 2012). Questa recensione analizza la visione educativa moderna di Maria Montessori, alla luce dei bisogni emergenti dei bambini di oggi. Il contributo esamina la letteratura esistente incentrata su corpo e movimento, ma connessa agli aspetti cognitivi, emotivi e di benessere, che sono fondamentali nell'educazione prescolare, sia per gli educatori / insegnanti (Atli, 2016; Akkerman, 2014; Lillard, 2011), sia per le politiche di riforma scolastica (Lillard, 2019).

Keywords: Montessori; embodiment; infancy; education; body/movement

Parole chiave: Montessori; embodiment; infanzia; educazione; corpo/movimento

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1. Introduction

The starting point of the embodiment theory is that mental activity is influenced by sensory and motor systems, including, of course, body and action (Glenberg, 2010, p. 586). The Perceptual Symbols System (PSS) theory highlights a close relationship between brain activation and perception with concrete sensorimotor experiences (Barsalou, 1999). The dynamical systems and embodied cognition theory (Smith, 2009; Thelen & Smith, 1994) have emphasized the role of the body and movement in learning and cognitive development, considering sensorimotor processes fundamental in the body-mind-environment interaction.

In Italy, in the context of these theories, pedagogy is trying to highlight the transition from embodied cognition to embodied education (Francesconi, 2011). The embodiment is seen as the integration of the motor and perceptual matrix into self-awareness (Caruana & Borghi, 2013), in a first-person perspective (Francesconi & Tarozzi, 2012) as a situated cognitive action, where the relationship between subject-object and environment is realized. As Tarozzi (2008) states, a vital form of the mind that manifests itself in bodily experience. This normally happens in the framework of physical education and sport (Ceciliani, 2018). In the last century various educational approaches, including the Montessori one, anticipated the idea of a school that promotes concrete experiences based not only on cognition but also on action (Strongoli, 2019, p. 465).

Maria Montessori claimed that «movement, or physical activity, is thus an essential factor in intellectual growth, which depends upon the impressions received from outside. Through movement we come in contact with external reality, and it is through these contacts that we eventually acquire even abstract ideas» (Johnson-Glenberg, 2017, p. 194). The Italian scientist understood the potential of the embodied approach in the educational method, the need to create a teaching situation carried out directly and concretely (firsthand experiences) through a sensorimotor involvement (Lozada & Carro, 2016).

Action is a human evolutionary instinct and, as Montessori stated (1949), development is the child's work based on intrinsic motivation. This work asks for a pedagogy able to design the correct environment (Rossini, 2020, p. 91), one where the child can work spontaneously with concentration, commitment, joy and satisfaction. Almost like a great game, that allows every child guided by an adult to act with freedom and responsibility (Cossentino, 2006, p. 66). «Movement, or physical activity, is therefore an essential factor in intellectual growth [...] Through movement we come into contact with external reality, through these contacts we also acquire abstracts ideas» (Montessori, 1966, p. 36).

Montessori has anticipated the modern theory of cognitive psychology, called "embodied cognition", that shows how the motor system affects our cognition just as the mind influences the actions of the body. Her intuitions are confirmed today by a solid scientific basis and her pedagogical idea, fully respectful of each child, presents a pleasant school model, which does not bore children but involves them in pleasant learning experiences.

In Montessorian teaching, movement is fundamental and classes are organized so that children can move around the class, use jump ropes or yoga cards (gross-motor skills) or manipulate different kind of objects (fine-motor skills)[i]. This approach helps children to be more focused and able to learn (Akkerman, 2014, p. 5), because movement is a positive integration to learning activities, as demonstrated by current scientific research (Castelli

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et al., 2011), and it is possible to incorporate it in the classes (Marzano, 2012; Wells, 2012; Helgeson et al., 2011; Lubans et al., 2010).

Children need to move and it is typical of all children to think with their hands: «The hand is that fine and complicated organ in its structure that allows the intelligence not only to manifest itself, but to enter into special relationships with the environment [...] activity concentrated on some task that requires movement of the hands guided by the intellect» (Montessori, 1966, p. 138). The basis of education is the combination of body/senses/intellect, and practical activity is encouraged in children. This is what Montessori defined as the process of normalization of the child:

> «Watching a child makes it obvious that the development of his mind comes about through his movements. In the development of speech, for example, we see a growing power of understanding go side by side with an extended use of muscles by which he forms sounds and words... Movement helps the development of mind, and this finds renewed expression in further movement and activity. It follows that we are dealing with a cycle, because mind and movement are parts of the same entity» (Montessori, 1967, p. 146).

Movement is one of the fundamental principles of the Montessori method, it is integrated in each educational proposal – movement is inseparable from work (Montessori, 1967). Children are invited to act in the environment, with respect to learning objectives, with attention to the coordination and control of movements (Haines et al., 2003). Maria Montessori was therefore a precursor to embodied education, inspiring an educational model still very active across the world and now also supported by scientific evidences.

2. Gross and fine motor skills connection in Montessori approach

The connection among gross-motor skills (crawling, climbing, walking, jumping, etc.), fine-motor skills (grasping, holding, carrying, throwing etc.) and cognitive functions is an important aspect of the Montessorian approach. These motor activities increase interest in both exploration and knowledge of the physical word. Recent research highlighted how embodied action, essential to develop knowledge, vocabulary and cognitive skills, is closely related to Montessori discoveries (Lillard, 2005, p. 41).

Examples in grasping and manipulating objects can include:

- children who manipulate objects develop more interest in exploration and knowledge of the physical word than less active object explorers;
- children capable of grasping expand their exploratory world by moving in the space to reach and grasping objects. In other words, they restrict and cancel the space that separates them from the objects to be grasped. In this cognitive action, they connect gross motor skills (moving in the space) and fine motor skills (manipulating);
- children used to explore space and reach objects develop a greater attention to new objects in the environment compared to peers who explore less;

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- children used to use gross-motor skills and fine-motor skills to explore the environment develop more social cognition. In particular, in relation to paying attention to other people's actions.

Some examples of crawling, one of the first gross-motor skills that allows children to master the surrounding environment (Campos et al, 2000), can include:

- Exploring the space through crawling develops abilities in the perception of both physical (perception of distance and spatial layout, perception of one's own body motion) and social domains (ability to refer to object by pointing or to search for hidden objects).
- The self-locomotion seems to develop the perception of the self, spaces and other people. The perception of space, through self-locomotion (crawling, walking or running) also implements the perception of the imagined space. Walking with open eyes or blindfolded in a known space, involves the body with the imagination, even when one is not actually in that specific space (Rieser et al, 2004; Griffin, 1995).

The connection between gross and fine-motor skills forms the basis for purposeful movement. The experiences of using of one's body, exploring the space (gross motor skills) and manipulating objects (fine motor skills), produce some important effects:

- one's sense of self efficacy;
- knowledge of adequate skills to move in the space;
- consciousness of being the agents of change both in space and for objects;
- inspiration to continue engaging in similar experiences where body and movement are linked to specific goals.

In other words, as Montessori claimed in her educational model in which movement is deeply implicated, it is important to let the child free to connect his/her gross and fine motor skills to achieve their own chosen goals. These embodied activities are important for the perception of one's abilities and the possibility of achieving goals through the integration of mind and action: gross-motor skills to master space and reach places, fine motor skills to manipulate object.

Moving in the spaces with intentional activities represents a virtuous loop in which mind and action are truly integrated into a single entity: a way in which the movement assists mental development through the use of objects. Purposeful moving means aligning body and action with one's thought in an integrated loop: thinking about action can also be interpreted as acting with thought. Where are the borders? Where are the dichotomies? Child embodiment suggests that mind and conceptual thought is grounded in sensorimotor experience and in lived situation (Johnson, 2007, p. 70).

In the Montessori method, objects are placed and organized in the environment to encourage children to move intentionally in the space to grab objects and use them. Recent research (Pate et al, 2014) has shown that children in Montessori schools are much more active, compared to students in traditional schools, especially thanks to the presence of moderate and vigorous daily physical activity. In the same way, the environment can be designed to stimulate gross motor skills through an appropriate configuration such as the following: a bridge, a slide, a tunnel, a balance beam (Shivij, 2016). This confirms the importance that movement and action have in Montessorian school.

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3. Sensorimotor exploration through fine-motor skills: the hand in touch

In the Montessori philosophy, the binomial teacher-learners opens to surrounding environments where embodied skills are emphasized, such as manipulating objects, materials and tools also in open spaces (Lozada & Carro, 2016; Montessori, 1914).

Already in the last century, the Italian scientist observed the connection between the action of the hands and the cognitive development in an embodied conception of education: the hands are the instruments of man's intelligence (Montessori, 1967). She created several objects that encouraged fine motor skills (Rule & Stewart, 2002) for both their cognitive (Dinehart & Manfra, 2013; Cameron et al., 2012; Son & Meisels, 2006) and social-emotional development (Stewart, Rule & Giordano, 2007, p. 108) in an idea focused not only on specific learning but also on the development of whole areas of personality, such as cognitive and social areas.

This holistic approach was so important for Montessori, that she thought of extending its application to exercises of practical life (such as elementary movements, care of self, care of the environment, care of others or grace and courtesy) as interactions with the environment (Montessori, 1967, p. 88). These areas embodied both fine and gross motor skills in concrete situation of daily life. The purpose of these activities was related both to their learning, and to assist the social and emotional development of the child (work habits, strong inner sense, cognitive control), both at school and at home (Blair & Diamond, 2008).

For these reasons, the space must be prepared, enriched with materials specially designed for children's sensory exploration (Roessingh & Bence, 2018, p. 31; Rossini, 2020, p. 99) in an approach that already anticipated the embodiment theory. This is the Montessorian principle of the "prepared environment" (Phillips & Daze, 2018, p. 2; Rossini, 2020, p. 91), in which the learning setting allows children to use their body, action and intelligence, in independent work and discovery to learn and develop themselves: in this approach, educating does not mean learning by listening to words, but acting on the environment and objects as a center of attention-concentration-action. These psycho-motor operations can be both instinctive and mediated by the preparation of the educational setting by the adult. The child's involvement in these activities, motivated by the pleasure of acting and discovering, leads him/her to repeat the activities until he/she has learned them. This happens because learning is embodied and cannot dissociate action from cognition, but both, thanks to the repetition of the task, achieve its learning. In repetitive practice it is also possible to insert, from time to time, the teacher's demonstration to stimulate mirror neurons in children: observing first, and then acting. It is no coincidence that mirror neurons are both sensory and motor cells (movement-mind embodied system).

It is above all in *The discovery of the child* that Maria Montessori explains the meaning of sensorial education:

> «L'ovvio valore dell'educazione e del raffinamento dei sensi, allargando il campo della percezione, offre una sempre più solida e ricca base allo sviluppo dell'intelligenza. Per mezzo del contatto e dell'esplorazione dell'ambiente l'intelligenza innalza quel patrimonio di idee operanti, senza le quali il suo funzionamento astratto mancherebbe di fondamento e di precisione, di esattezza e di ispirazione. Questo contatto è stabilito per mezzo dei sensi e del movimento [...]. Vi è anche un altro lato importante di questa educazione. Il bambino di due anni e mezzo o tre che viene nelle nostre Case dei Bambini ha, negli anni precedenti della sua vita molto attivi e mentalmente svegli, accumulato e assorbito una quantità di impressioni. Questo

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> notevole fatto, la cui importanza può essere difficilmente esagerata, avvenne, però, senza alcun aiuto o guida dall'esterno. Impressioni essenziali e casuali sono tutte accumulate assieme, creando una confusa, ma considerevole ricchezza nella sua mente subcosciente. Con il graduale manifestarsi della consapevolezza e della volontà diventa imperativo il bisogno di creare ordine e chiarezza e distinguere tra l'essenziale e il casuale. Il bambino è maturo per una riscoperta del proprio ambiente e della ricchezza interiore di impressione che ne ha riportato» (Montessori, 1950, pp. 109-110).
>
> «The training and sharpening of the senses has the obvious advantage of enlarging the field of perception and of offering an over more solid foundation for intellectual growth. The intellect builds up its store of practical ideas through contact with, and exploration of its environment. Without such concepts the intellect would lack precision and inspiration in its abstract operations. This contact is established by means of the senses and movement [...] There is also another important aspect of this education. The child who comes to our Children's House, in the previous years of his life was very active and mentally awake, and has accumulated and absorbed a number of impressions. This remarkable fact, the importance of which can hardly be overstated, happened, however, without any outside help or guidance. Essential impressions and random ones are all piled together creating a confusing, but considerable wealth in his subconscious mind. With the gradual manifestation of the awareness and will, the need to create order and clarity and to distinguish between the essential and the random becomes imperative. A child at this time is ready to rediscover his own environment and the inner wealth of impressions which he has of it» (Montessori, 1950, pp. 109-110).

The most embodied aspect of these experiences is the fact that when the child touches an object, he/she is in turn touched by the object, which he/she transfers to his own bodily sensations that immediately integrate self-memory and object memory. Mind and action are embodied in a single construct, where cognitive and bodily aspects are integrated (Johnson-Glenberg et al., 2017, p. 119).

The fundamental idea of this concept is to consider the cognitive activity as being distributed between the individual and the situation with which he/she's interacting, a cognitive system that is unified and not situated just in the brain (Ceciliani & Tafuri, 2017, p. 151). Currently, there is a focus on embedded didactic models involving the body trough relationships between motor action and the learning context (Gill, 2018, p. 2; Lindgren & Johnson-Glemberg, 2013, p. 445).

This kind of concrete activities were not only considered relevant for the academic topic but also for the understanding of abstract concepts and the development of the whole person in terms of social and citizenship skills (Lillard, 2016; Zimmerman & Schunk, 2014). In addition, the method used play and physical motor skills as an important frame in children education (Bhatia et al., 2015; Lillard, 2013; Pate et al., 2014).

In this full body-mind involvement, Montessori saw the possibility of stimulating the sense of competence, motivation and good emotions (Patall et al., 2010) in children and their tendency to learn and discover (Scott e al. 2017).

The idea that children had to act autonomously with their own body and mind, a concept already very close to the recent psychological and neuroscientific theories, was very clear in Maria Montessori:

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One of the greatest mistakes of our day is thinking about movement by itself, as something apart from the higher functions. [...] Mental development must be connected with movement and be dependent on it. It is vital that educational theory and practice become informed by this idea (Montessori, 1967, pp. 141–42), in particular for the role that the adult has to take on:

> «It is true that the child develops in his environment through activity itself, but he needs material means, guidance and an indispensable understanding. It is the adult who provides these necessities. [...] If [the adult] does less than is necessary, the child cannot act meaningfully, and if he does more than is necessary, he imposes himself upon the child, extinguishing [the child's] creative impulses» (Montessori, 1956, p. 154).

This highlights the idea to bring out the individuality of the child, encouraging him/her to exercise their own initiative, supported but not replaced by an adult. A real embodiment where the whole personality of the child is involved, not just his mind while sitting at the desk or just his body when performing actions imposed by others. This pedagogy, nowadays consolidated, was absolutely innovative when Montessori outlined it, at a time when the child's attention was conceived as submissive aid to education.

4. The concept of mindfulness

To educate children in concentration it is necessary to offer them situations in which they can act and move. Movement helps stimulating several parts of the brain, allowing the child to do the things he likes while concentrating on solving tasks. This type of situation requires the child to activate different cognitive functions: make his/her own choices, choose and control the most appropriate movements to solve the task (Lillard, 2005).
For this reason, Montessori postulated the idea of deliberate environments to encourage exploration and manipulation of children. In other words, concentration comes from the child's ability to focus his attention on a particular aspect of the environment that elicits his/her desire to act. (Shivij, 2016, p. 6).
Through the action of his own body, the child, free to act on the environment, learns to regulate himself and develops one of the first cognitive function: the motor and behavioral inhibition (Diamond, 2007; Barker & Munakata, 2015). Thanks to this, children can explore the environment with greater accuracy and precision of movement, increasing motivation, attention and concentration that are not as stimulated in traditional educational setting, sitting at the desk, listening to the teacher (Lillard, 2005, p. 326).
In this construct, Montessori also anticipates the theories on mindfulness, on the search for deep concentration created by situations, such as the exercise of silence or walking on the wire (Montessori, 1950, p. 312), which already at that time aimed at integrating mind and body (De Simone, 2015, p. 134; Lillard, 2011). In the exercise of walking on the line, movement training and muscular training were integrated into a harmony of attention: here the central feature was the concentration (cognitive function) that the sense of touch afforded (sensorimotor component). According to Montessori, the sense of touch, basis of all other senses, was the great interpreter of vision and guide to accuracy of perception (Sobe, 2004, p. 188). The sense of touch is the most embodied of all the senses, together with taste. Montessori pedagogy was already embodied, emphasizing connecting children

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with objects. But not only that, we already read an approach in which the whole body (all the senses) could be seen to be attentive. The whole child is therefore concentrated on the object, not just his hands. Attention therefore becomes an integral, embodied element of all cognitive-emotional and sensorimotor functions.
In this way, someone defined the Montessori approach as a "Pedagogy of attention" which synthesizes the embodied approach, as Montessori stated: «When you have solved the problem of controlling the attention of the child, you have solved the entire problem of education» (Sobe, 2004, pp. 283-284).

5. Teacher role

For these reasons the synthesis of how to prepare to be an educator must be crystallized not only in cultural, pedagogical and didactic preparation, but also in what Montessori defined as *spiritual preparation* (Cristiensen, 2017, p. 36). Peculiar aspects of this spiritual preparation are the abandonment of preconceptions about children, the admiration of their abilities and respect for their potential development. Teaching means having humility and patience, it means observing, reflecting and guiding children to become active citizens of a better world (Atli et al., 2016, p. 128). These Montessorian principles open to a teaching centered on the child's action rather than the adult's action (it was very innovative at Montessori's time).
A kind of embodied approach can also be seen in this idea of Montessorian teacher and teaching: the material, the setting is essential, and not the teacher. The child must be the embodied protagonist of the didactic action and the teacher his/her attentive-loving servant. The Montessorian approach thinks of a teacher who involves the child in the action of learning and, at the same time, he/she involves himself in this embodied practice. When this does not happen, research recognizes an educational disadvantage (Atli, 2016, p. 132).
In this role of teacher-servant, it is necessary to reflect not only on the material to be prepared, but also on its use which must be left to the free interpretation of the child or assisted by the teacher with appropriate suggestion (Rossini, 2020, p. 116). In any case, «it is strictly necessary to avoid stopping spontaneous movements and imposing arbitrary tasks» (Montessori, 1964, p. 88). The teacher's function is to cultivate, recognize and encourage these movements because they are the expression of the child's inwardness, of his/her embodied behavior. The authority of the adult, on the other hand, seems necessary to guarantee the safety of the child. But how can one be authoritarian without creating obstacles to the child's action? The answer lies in the Montessorian concept of the prepared environment (deliberate setting) to give freedom to the child within a framework of acceptable rules for a spontaneous and safe experience. In this way, the interests of children are protected and their motivation and concentration in activities are guaranteed (Marshall, 2017).
With these educational principles, the child can work spontaneously and, based on the result, control any errors through a refined motor action that integrates the information received from the senses (eye, hearing, touch or the whole body). These behaviors, prompted by the preparation of the environment and materials (deliberate setting by the teachers), require constant cognitive-motor control by the children and an action based on self-correction and mastery, independently from educator.
Allowing the child to be free to work means allowing him to use body and mind, hands (manipulation) and cognitive function and, as Montessori had guessed a century ago, the natural connection between mind and

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hands is respected in full harmony with the theories of embodied cognition (Barsalou, 2002; Lakoff & Johnson, 1999). Montessori had anticipated what neuroscience tells us today: We learn best when we can move our bodies in ways that align with our cognition. This is no wonder, since our minds evolved for action, for behaving in an environment (Lillard, 2005, p. 326).

In summary, we can say that the cardinal principles the educator must be inspired by are the following: «learning defined as a natural process, the necessity of spontaneous activity, a prepared environment, and the transformation of the teacher from a classroom star to an actor in a supporting role» (Ross, 2012, p. 93)

6. The influence of the Montessori approach on school reform policies

The Montessori educational idea has inspired the path of school reform year after year. It spread faster around the world than in Italy, where the scientist was initially criticized. Her thought has more or less consciously guided the path of childhood education. Although without specific reference to her ideas, some educational reforms have applied aspects of her method or re-proposed educational visions she first intuited, studied and disseminated.

We can think about the classrooms, their conformation, the smaller desks are separated from the chair to give more mobility to the child, the sensory/didactic materials. Let us also think of the transition from a teacher-centred approach to a child-centred one, that she supported and defended despite being inconceivable at her time. A clear opposition to authoritarianism, a clear distancing from black pedagogy (Rossini, 2020, p. 154), in favour of a greater respect for the child, his/her time for development, his/her autonomy and his/her responsible and trustworthy presence.

The Montessori idea of the child's freedom and of self-learning represent the original seed of a change taking place in schools around the world and it possibly also inspired today's libertarian schools. Despite the evolutions of pedagogy do not always refer to Montessori's intuitions, she was the first one to explain and teach them. Education today moves on these intuitions and it recognizes them an unquestionable relevance. In these pedagogical changes, the teacher's role has also changed (Pironi, 2014) along with parental involvement (in Italy through the Delegated Decrees of 1974).

The modern learning technique of Outdoor Education, widely implemented during the Covid-19 pandemic, is closely linked to Montessori's environmental approach. To the Montessori method we can also link the intuition of education for global/universal citizenship. This was already part of her method and today it represents one of the priority objectives of the European Community.

Montessori's thought has made the world of education flourish in one century, and it has inspired educational reforms around the world, including in our country. Step by step, Montessori educational principles have infiltrated into the school, where the centrality of the child and his/her cognitive-emotional involvement are no longer in question (Tomar, 2014, p. 1).

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Many were inspired by her, without necessarily mentioning her. Only today her vast pedagogical work is finally recognized along with her courage in proposing and defending her approach, in times when there were no spaces for innovative and modern thoughts, despite them being supported by her scientific research (Pironi, 2014). Today we are here in front of a giant more and more present, in a school that tries to follow her footsteps, albeit with some difficulties. Today the work of Maria Montessori is no longer ignored or resized, but it is recognized as a universal contribution all of us educators are indebted to.

8. Conclusion

Montessori's work is an embodied approach (Rathunde, 2009) in which children are invited to act rather than sit still and listen. The basic concept refers to the belief that the embodied activity supports abstract symbols and thoughts in dynamic play with the environment.

The first consideration is the sensory-motor connection of the action in the learning context. In the Montessori method, placing the hands on the material or in the situation, though direct action, provides an experience that can make the learning more obvious, more embodied, lived: «[...] movement has great importance in mental development itself, provided that the action is connected with the mental activity going on. Watching a child makes it obvious that the development of his mind comes about through his movements. [...] Mind and movement are parts of the same entity» (Montessori, 1967a, p. 142).

The second consideration is that children need to move, their energy must be transformed into action, through freely chosen concrete experiences, linked to everyday life in a context in which mind and body can act in the here-and-now, in a mindfulness situation. The freedom granted to children to choose, explore and decide activates their attention, concentration, interest and motivation.

In this situation, as it happens in Montessori schools, children are able to work for hours without getting tired. These long periods of work are supported by motivation which, in turn, supports mindfulness learning. Maria Montessori (Rathunde, 2009, p. 73) also recognized the importance of open spaces and nature for her educational model. Her idea of an active school, based on body involvement and action, inspired a direct contact between child and nature: «There is no description, no image in any book that is capable of replacing the sight of real trees [...] in a real forest- Something emanates from those trees which speaks to the soul, something no book, no museum is capable of giving» (Montessori, 1973, pp. 35-36).

Modern theories on embodied education today explain how direct contact with nature supports human cognitive and emotional development, especially in children:

- It inspires motivated learning;
- It produces restorative effects on attention;
- It inspires awe and beauty;
- It explains phenomena where they occur naturally.

Especially with regards to awe and beauty, Montessori considered these two factors important to motivate children's learning through intrinsic motivation, interest, fascination (Montessori, 1973, p. 37): Maria Montessori

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was an early practitioner of embodied education and inspired an educational movement that is still very active across the world. She understood that the most important path to a child's natural gift was an «activity concentrated on some task that requires movement of the hands guided by the intellect» (Montessori 1966, p. 138*).*
In this philosophy, it is possible to notice how the integration between body, senses and mind is the key to the Montessorian educational model, where children are encouraged to (Rathunde, 2009, p. 78):

- use body and movement (gross-motor skills);
- use the hands for manipulation (fine-motor skills);
- explore their indoor environment, structured to facilitate movement and manipulation;
- explore their outdoor environment to connect with nature and its beauties;
- use of sensory materials (sound cylinders, color tablets, sandpaper tablets, etc.).

In other words, Montessori recognized the importance of individualizing education on students' personal differences, with an educational model characterized by an embodied (sensorimotor) approach. The idea that makes the Montessori approach closely linked to embodied education, beyond the model that characterizes it, is the following aspect: thinking that what happens at school should have an impact on life, on the world, on everyday life. This is the true embodiment, something that each person acquires in themselves and can use with intelligence at any time in life. In the educational context, there is nothing more inclusive than this.
The Montessori method has other important advantages (Lillard, 2019), including teacher satisfaction and parental support. As far as teachers are concerned, factors include psychological training, sharing of the child-centered educational approach, greater well-being due to teacher-learner relationship. As for the parents, the reasons seem to be due to the attraction towards educational principles, the involvement of children (Debs, 2019), their joy and motivation, their better result and their academic achievement.
The Montessorian approach appears extremely relevant and modern, also thanks to research which confirmed its scientific basis (Lillard, 2019). Its positive aspects, together with its congruence with modern theories of embodied education, deserve particular attention as an alternative model of a school aligned with the actual needs of national education systems.

Notes

[i] Gross motor skills refer to the ability to control the locomotor movements used for walking, running, jumping, etc. In other words, they help master the environment with large movements. Fine motor skills refer to fine and precise movements made by the coordination of the hands to manipulate, write, draw, play an instrument (Cameron et al., 2016; Ceciliani, 2015, 2016).

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