CORPOREITY AND EMOTION:
BETWEEN THREE-DIMENSIONALITY AND MULTIDIMENSIONALITY

CORPOREITÀ ED EMOZIONE:
TRA TRIDIMENSIONALITÀ E PLURIDIMENSIONALITÀ

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ABSTRACT

The fourth industrial revolution and the emergence covid 19 have outlined new boundaries of the teacher-student relationship between pixel-bodies, inhibiting the three-dimensional body. It is necessary to intercept specific spatio-temporal devices that consider the paralinguistic features of the body in motion in direct contact with the emotional experience, to foster in the child the acquisition of inter/intrapersonal skills and in the teacher the ability to responsibly orchestrate AI and IE.

La quarta rivoluzione industriale e l'emergenza covid 19 hanno delineato nuovi confini del rapporto insegnante-studente tra pixel-corpi, inibendo il corpo tridimensionale. Appare necessario intercettare specifici dispositivi spazio-temporali che considerino le caratteristiche paralinguistiche del corpo in movimento in contatto diretto con l'esperienza emotiva, per favorire nel bambino l'acquisizione di competenze inter/intrapersonali e nell'insegnante la capacità di orchestrare responsabilmente IA e IE.

KEYWORDS

Corporeality; Artificial Intelligence; Emotional Intelligence
Corporeità; Intelligenza Artificiale; Intelligenza Emotiva

Introduction

The kaleidoscopic and multidimensional coordinates of educational policy, to which the contemporary school system has to refer, are increasingly determined by the need to endow schools, the quintessential educational device, with the inescapable adaptability that will make them capable of facing the challenges, seizing the opportunities and mastering the complexities triggered by the fourth industrial revolution (Schwab,2016). In the evident importance of supporting human beings in learning proactive strategies to be adopted to deal with various daily problems throughout life (*life-long learning*), the World Health Organization, already in its 1993 document *Life Skills Education in Schools* and 1994 document *Life Skills Education for Children and Adolescents in Schools*, considers the school the ideal place for interventions useful for the construction of identities capable of making health-conscious choices in a critical manner, enhancing the subject's capacities for resilience and proactivity (Antonovsky, 1987). School, therefore, is constituted not only as a gymnasium of citizenship characterized by interactions and connections with peers and teachers, but also as an elective *setting* in which individuals can construct their identity and realize their process of personal self-realization and *self-efficacy* (Bandura, 1997; 2000). Theoretical orientations such as the salutogenic (Antonovsky, 1987) or the *Goodness of Fit Theory* (Chess & Thomas, 1991) confirm how the learning/teaching process is decisively influenced by the characteristics of the environment and the relationship with the teacher, and how the good outcomes of such interactions, from a constructive and metacognitive perspective, favor the construction, consolidation and meaningfulness of the acquisition of knowledge, skills and competencies. In order that the educating community, interpreted as a plural place where school, family and other educational agencies converge, can be able to comply with quality, equitable and inclusive education, appearing as a learning opportunity for all (ONU, 2015), pedagogical choices are necessary for the creation of a classroom life (Moé & De Beni, 2000) that promotes meaningful disciplinary content, in line with the strengths and interests of each and every one. The effective creation of a positive, inclusive, and constructive classroom climate requires the promotion of participatory learning that is able to make use of self-regulation strategies, calibrated to the individual and interpersonal characteristics of those involved and the socio-emotional aspects underlying the relationship.

In order to fully support and develop, from an inclusive perspective, the different cognitive potentials, to recognize and enhance the relationship, diversity, and interaction with the history of each and every one, it's necessary to imagine and understand the educational system as an *adaptive complex system* (Sibilio, 2015)

whose reticular structure is constituted, in turn, of other adaptive complex systems, interconnected by nonlinear links and interactions (Pasquariello, 2018). It is essential to consider, from the perspective of an increasingly syncretic connection of different educational scenarios, the enhancement of a socio-emotional educational pathway, through the implementation of teaching strategies that are capable of exploiting bodily consonances to bring out those emotional connections useful for the promotion of the ability to recognize and manage emotions, prove helpful to others, develop positive relationships, make responsible decisions, and solve problems in a constructive manner following one's own morals and ethics (Elias et al., 1997; Payton et al., 2000).

Considerations regarding the automation processes, robotics, and artificial intelligence in the new society of individuals (Zuboff, 2019), inevitably invest the school context as well, whose areas of relevance take on multidimensional aspects concerning those inter-body, relational and cognitive processes that develop simultaneously and non-linearly in the tangible contexts of the here and now and in the extended and overlapping contexts of the virtual environment.

Among the most advanced innovations in Artificial Intelligence systems, *Affective computing*, also known as *Emotional AI*, represents a branch of Artificial Intelligence that, through *software* capable of encoding and predicting the quality and intensity of the user's state of mind, aims to improve the quality of human-machine interaction. Its implementation in learning/teaching processes aims to improve the quality of participation and teaching itself.

With the aim of not taking *a-priori* positions that may place the writer neither in a blindly optimistic view, recognizing artificial intelligence as having an almost salvific role in contemporary complexity, nor in an apocalyptic view, conferring to digitization sinister results in education, this paper intends to explore in a rational and layman's way the potential of bodily experience in the real-virtual duality, in relation to the new emotional scenarios that can be configured in teaching and learning experiences.

1. Artificial Intelligence and Emotional Intelligence: two opposing paths?

The technical potential of Artificial Intelligence is undoubtedly capable of bringing considerable benefits to people's lives as it can resolutely and sophisticatedly impact on the health sector, public administration, increased efficiency of infrastructure, industries, reduction of energy use, and an amplification of learning dimensions in education. However, at the same time, progresses in technology applied to biology, robotics, and neuroscience, multiplying the supply of dynamic practices of action and thinking, have generated spaces and dimensions of hybridization and contamination and accelerated the capacity of human beings to

increase, increase themselves, and go beyond themselves (Cipolletta, 2021) defining, thus, the boundaries of an extended corporeality.

At the beginning of the new millennium, Polish sociologist, and philosopher Zygmunt Bauman discussed how the connection between and with technological devices could inhibit human intelligence and information processing capacity, leading to a decrease in the ability to concentrate and an increase in anxiety and fears; and fostering an unhealthy attitude aimed at pretentious and instant gratification (Bauman, 2001).

The radical implications of the ubiquitously connected computational apparatus, the global marketplace, the multiplicity of communicative exchanges, the shattering of dialogues, and the erosion and dematerialization of human relationships inevitably and progressively accelerate touch reflections around the body in the educational sphere. The mass-mediated and virtual society has redefined the idea of skin with the creation of the *smart-skin* or *e-skin* (the electronic skin) born to supervise and diagnose health problems such as Parkinson's disease and used today to realize the dream of ultra-discrete ubiquity (Zuboff, 2019). The outcomes of such transformations describe important changes in the experience of body perception and representation, within new digital boundaries in which a body-pixel without spatial/temporal connotations (Milani, 2010), redefines the two-dimensional and yet extended characteristics of corporeality. Among the experiments that have used the encounter between artificial intelligence and emotional intelligence, the use of *affective computing* in a school, in China, for example, marked students' level of attention in order to verify when the teacher's actions had lower feedback in terms of concentration. The consequences of similar experiments, far from being associated with simplistic interpretations of the data, should instead lead to deep considerations that are inserted into a twofold matrix in addressing in a secular manner the issue of the integration of human and artificial intelligence: in fact, it is not considered a replacement of the human capacity for intelligence, create and be in relationship, *hic et nunc*, as much as being able to instruct the virtual environment, with an all-human ethical sensibility that is able to effectively meet the new.

Artificial intelligence, in this and other and different experiments, can never replace humans, their experiential skills that are not composed only of acquired notions and data, but rather co-evolve in and with the process of human/environment interaction. However, it would be anachronistic to imagine its interruption and equally unrealistic not to consider its potential in the educational field as well.

In reference to the educational experience, especially with children, it is appropriate, therefore, to create spaces for reflection that know how to exploit the

potential of the virtual environment so as to generate learning dimensions in accordance with the smart needs of digital natives for whom virtual and immersive environments represent an indispensable factor of self and of surrounding environment awareness. It is important to reflect on the possibility of implementing a kind of alliance between naturalness and virtual (Gamelli, 2011) within which technology can neither obstruct nor replace but rather foster "the encounter, the contact between self and other, the exploration and reinvention of learning spaces" (Idem, p. 20).

However, the virtual, two-dimensional and artificial corporeity of mass media society, renouncing the three-dimensionality of the Husserlian body, would seem insufficient to integrate the human evolutionary need to become presence in the relationship with self, with others and with the value of the body itself (Milani, 2010), risking generating a contraction of planning ability and a containment of the potential of education, which instead is, pre-eminently, bodily experience (Isidori, 2002). On the other hand, it is clear how algorithmic predictions, unlike human emotional intelligence, are unable to handle expected and unexpected events with common sense and the human ability to understand and recognize others' states of mind and their subtended thoughts. The literature derived from the identification of *mirror neurons* (Gallese et al., 1996; Rizzolatti et al., 1996) offers essential suggestions about the individual's ability to activate, in a pre-linguistic and pre-reflexive manner, processes of embodied simulation of sensations, actions, and emotions that represent the common foundational mechanism underlying the processes of motor imagination, observation and imitation of actions, and empathy (Gallese, 2003). According to what Daniel Stern calls *affective attunement* (affective consonance), or a kind of cross modal equivalence of interpersonal affective expressions (Gallese, 2003), communication and detection of emotional events are constituted as a complex multi-componential phenomenon. The joint action of signals of different nature such as words and the tone of voice in which they are spoken, facial expression, posture, a gesture, a laugh, a gasp, properly contextualized, combine with each other in a precise expressive pattern, acquiring considerable communicative value (Carrera, 2007). To focus on human capital and connections with the inner world, in the area of emotional intelligence, instead of hyperconnection with virtual reality, means to pursue the will to give the human being, the virtuous ability to transform perceptual and sensory resonances into physical and personal experience, even in light of the profound transformations that characterize today's society.

2. Seeing with the body

"In conventional education/learning research, learner motivation can be known through post-event self-reported questionnaires. With the advance of affective computing technology, researchers are able to objectively identify and measure a learner's affective status during the entire learning process in a real-time manner, and then they are able to understand the interrelationship between emotion, motivation and learning performance" (Chih-Hung Wu et al., 2016, p. 1304).

The implications of such an approach of software, especially when considered in the school setting where the decisive role played by emotions and motivation is now well known, require important considerations about the issues of mutual recognition, of inter-corporeality between children and between them and the teacher, of the processes of syntonization and synchronization that regulate the quality of interactions and that are at the basis of the establishment of a meaningful relationship between subjects.

Especially in educational-didactic interventions intended for the developmental period, but more generally in all levels of education, it is not only a matter of being able to operate an effective "reading of the classroom", which is undoubtedly useful for the planning of fruitful educational-didactic interventions, but also of reflecting on how much the complex nature of interactions between dynamic systems provides for their constant mutual modification, which also enables their maturation, in a process of continuous *alignment* (Rossi, 2011; 2016). It is necessary for the body to be continually involved in this process of mutual recognition, since such constant interaction nurtures not only relationship and motivation in learning, but also fosters the continual maturation of more conscious and effective corporeity and inter-corporeality in communicative, cognitive and relational processes.

The assumption that looking at the shapes, gestures and postures of bodies is a main constituent of nonverbal language finds confirmation in various scientific and disciplinary fields. The brain mechanisms that underlie the kinesthetic and empathic involvement, which is activated in the observation of others' actions or postures, have only recently been demonstrated by neuroscience, and at the same time since the classical age artists have been wondering about the body-soul correspondence. Leonardo da Vinci already described how much intimate correspondence there was between corporeality and emotionality: "let the attitudes of men be with their limbs so disposed, that by those the intention of their soul is shown" (Da Vinci, 1817) or also the art historian and critic Aby Warburg who starting from Charles Darwin's text, *The Expression of Emotion in Man and Animals*, describes the indissoluble bind between emotional charge and iconographic formulas coining the term *Pathosforme* (Gozzano, 2016). More recent

neuroscientific literature has demonstrated and revealed the neural mechanisms that explain the link between image and embodiment and read the meaning of others' expressions of behavior without the need for any complex cognitive mediation (Gallese, 2003). A different description of empathy, at the basis of emotional intelligence, is attributed to Damasio's *as-if-body loop theory*, which describes the *'as if' body circuit*, according to which, by observing the physical and emotional behavior of others, the brain would appear to activate the same areas of the somatosensory and motor cortex that would be activated if the action were actually experienced. This principle has since been reflected in mirror neuron theory, in which inter-subjectivity has taken on inter-body connotations (Gallese & Guerra, 2015), according to which the correspondence existing between what is perceived of the body and our *Neuron Mirrors System* (NMS) consequently elicits even an empathic reaction of an emotional type. Thus, since the observation of others' actions is able to bring about an immediate participation of the areas of the neuro motor system appointed to the organization and execution of those actions, human beings are able to see with the body, but especially with the body in motion (Gozzano, 2016).

If the knowledge of self and other are thus irreducibly interdependent, the observation of bodies and the unavoidability of the narrative dimensions of corporeality are configured as that peculiar precondition of the educational task that know how to accommodate the multiplication of proposals, resulting from Artificial Intelligence through a wise pedagogical direction (Gamelli, 2011).

3. Educate from the body

According to the complex and multidimensional horizons outlined so far, schools and research have to question the urgency of reestablishing the outlines and outcomes of such perspectives, especially in the school setting, in order to establish reference points, redraw perimeters and boundaries, and intercept more effective methodological processes and practices to ensure that innovation does not impoverish educational dialogue. It is important, however, that the latter be accompanied by an appropriate strategy that can foster for learners the acquisition of inter/intrapersonal skills and for teachers the ability in a creative, responsible, and balanced manner, to orchestrate AI and IE to make the best of the advance of technology. This scenario thus refers to the need to intercept and safeguard specific space-time devices that consider the paralinguistic traits (Rivoltella & Rossi, 2017) of the body in movement in direct connection with emotional experience. In order for the school to concretely become a place of well-being for the child and the

teacher (Dato, 2004), what is proposed here is to preserve, within the educational-motor practices, experiential occasions in which to promote a conscious approach to movement with the aim of improving in qualitative terms motor skills and, with them, socio-affective behaviors (Colella, 2004). An educational intervention, therefore, that, enhancing perception and free expression, stimulates emotional dimensions through an embodied and holistic approach that, in recognition of the psychosomatic unity of the child, fosters a three-dimensional contact with oneself and the other (de Vera D'Aragona, 1994) and the construction of meaningful relationships with and between subjects (Gamelli, 2011). Specifically, this is a motor education sphere that, referring to the constructs of motor praxeology (Parlebas, 1997; Bortolotti, 2016), aims to arouse in the pupil the possibility of expressing his or her temperament and abilities by appealing to different motor activities such as play, expressiveness, exercise, improvisation, in order to recover ways and means through which the social-relational value of motor activities is manifested, reproducing the cultural and social principles that are useful in the education of the citizen.

Conclusions

Neuroscience, in placing interpersonal relationships within dimensions of an experiential nature, which foster a direct understanding of the meaning of others' actions, emotions and sensations (Gallese et al., 2012), describes the indissoluble link between the motor alphabet and other cognitive and emotional alphabets. the body represents the main reference of intentionality, so the real contemporary challenge, in the school environment, consists in "thinking" AI as an opportunity to enhance new skills and amplify learning opportunities, without renouncing, those contents of humanity essential for the construction of an emotional intelligence that is both situated and transcendent. This implies the need to train educators capable of designing motor education according to a bio-psycho-social, holistic, systemic and interactive approach that, on the one hand, encourages the intersubjective dimension of the relationship and, on the other hand, adopts a multi-perspective outlook in which the potential of Artificial Intelligence is perceived as a meaningful and creative action capable of complementing the purely human dimensions, without replacing them. The purpose of such an educational perspective lies in the possibility of interpreting and preserving the formative potential present in the various situations in which the body dimension is central in order to erect the scaffolding of an educational system that fosters the development of a self-awareness rooted in physical experience and based on the

connection between bodily sensations, emotional experiences, images and words, starting from the activation of the conscious dimension of the body to arrive at the effective acquisition and mastery of bodily-emotional and affective-relational skills. In promoting the acquisition of the competence to know and recognize one's own cognitive, bodily and emotional repertoire as the key to recognizing and interpreting that of others, while knowing how to discern its tangible dimensions from its intangible yet real ones, a horizon of meaning looms that would enable the faculty and learner to resolve and address the innumerable challenges of the contemporary and to critically negotiate corporeity and emotion in a scenario that safeguards bodily three-dimensionality, without giving up the pluri- and multi-dimensional opportunities offered by Artificial Intelligence.

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