

Complex And Connected. Proprioception And New Technologies

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Abstract: In recent years the advent of new technologies has brought significant changes in society making the growth of every subject “complex” and “connected”. In order to better respond to the new needs of learners/teachers, this theoretical-argumentative contribution, after an examination of the scientific literature on the relationship between body and artificial intelligence, wants to highlight the effectiveness and irreplaceability of a proprioceptive conscious approach to movement. This condition, necessary for balanced growth and meaningful learning, is confirmed by recent studies that help to demonstrate how, the conscious proprioception, albeit implemented by digital devices, can never be replaced because it is only the body that creates and makes the movement live.

Keywords: proprioception; corporeity; new technologies.

1. Introduction

From the second half of the twentieth century a new society of individuals is evidently emerging (Zuboff, 2020) that seems to confirm one of the mottos of the Chicago Universal Exhibition of 1933 «Science finds, industry applies, man adapts» (Zuboff, 2020, p.25). The achievements of new technologies, in fact, have triggered a kind of new Copernican revolution that is leading humanity to a real rebirth that sees the human being reconfigure as a complex and connected subject that reckons with a transcultural condition where ubiquity and simultaneity is a reality and an objective and concrete fact for all. Information scholar Martin Hilbert observes just how the founding elements of civilization, including «language, cultural heritage, traditions, institutions, rules and laws, are currently being digitized» (Zuboff, 2020, p. 221) re-defining every human experience by virtue of the aids and perspectives offered by interconnection.

The relationship of the body with the world is increasingly translated into an experience of presence ‘absent’, liquefied and rarefied in the digital world and a “concrete absence” in the physical world, extended and multiplied by automated processes. The body is thus acquiring the unprecedented ability to ‘measure themselves’ through technological devices by acquiring a new strategic ‘arrangement’ of the world (Cipolletta, 2021). The radical implications of the ubiquitously connected computational apparatus are unprecedented and require a deep analysis and careful



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study in order to place the use of artificial intelligence, next to the body dimension, as a tool and not as a purpose in itself, especially in the educational field.

The potential and achievements of artificial intelligence enter, in fact, in a disruptive and surprising way even in the body. Michelle De Mooy and SheltenYuen (2017) describe a new generation of wearable devices «armed with more sensors and intelligent algorithms [...] aimed at biometric monitoring [...] and body parts able to access the environmental context [...], smells [...] the emotional state of a person» (De Mooy, et al., 2017, p. 254).

The smart skin or e- skin (the electronic skin) was initially created to monitor and diagnose health problems such as Parkinson's disease, while today it is defined as the «ultimate sentient device, capable of enabling mass deployment and the existence of perpetual wireless networks» (Dublon, et. al, 2014, p. 255) and is used to realize the dream of ultra-discreet ubiquity (Zuboff, 2020).

In the light of the complex and connected horizons towards which man, more or less consciously, is marching, it seems urgent that the school and research question themselves on this situation in order to establish points of reference, redesigning perimeters and boundaries and intercepting the most effective methodological processes and practices for a new education of the body that, having become a crucial parameter of contemporary, must be re-educated so that it can represent itself and represent the world in a new pluriperic vision (Cipolletta, 2021) and become at the same time an instrument of awareness. 'Awareness' means, in this context, the ability to know and inhabit one's own body to the point of moving with mastery and familiarity in and with it. To live is a particular verb, often conceived in a passive way: to reside. Instead, it has an active sense, involving many spheres of our being, including responsibility and positioning ourselves within a context that we occupy and modify at every moment with our presence (Iaconesi, 2020). The body at the same time object and subject, that feels, that moves, that interacts, protagonist of what happens, inhabits the union of the finite and the unfinished, resulting in a sense of identity for which it is possible to assert that we do not 'have' a body, rather 'we' are our body (Plessner, 2020).

Therefore, in the learning-teaching process it would be appropriate to consider body language as an essential tool for «to improve the perception and awareness of self and of one's own corporeality; to facilitate self-expression; to enhance and enhance the creative abilities of the person; to discover the possibilities and dynamism of the body; to foster communication and interpersonal relationships; encourage the reunification of the person in his physical, psychological and emotional totality» (Manes, 1999, p. 18).

Further objectives were identified by Pavone (2010) in the promotion of the awareness of each individual, in its enhancement and in the recognition in its «its own uniqueness (which) welcomes and envelops it, so that it can feel totally belonging to the community, making its own contribution to it, thanks to its talents and personal resources» (Pavone, 2010, p.142), thus facilitating, also the creation of an inclusive environment «producing plots, overlaps and resonances in our emotional, emotional, psychic experience» (Gamelli, 2006, p. 9).

2. Body and technology

The teacher, but more generally the educator, is now a real operator of complexity and a mediator of new digital and bodily experiences. Education, in fact, is a global media, responsible not only for the formation of culture, but also for the formation of the imaginary, the perception of what is and what seems. The most recent scientific literature shows how the pervasive use of technologies has impaired learning by promoting the onset of stress; inhibited the motor vivacity of children; reduced the ability to concentrate; decreased curiosity and the ability to self-control; favored obstacles to emotional, cognitive and behavioral regulation (Cerniglia et al., 2020, p. 187; Pisano et al., 2020). In particular, the increasingly pervasive use of technologies, already known in relation to the generation of post-millennials (Iavarone, 2022), has significantly increased in pandemic and post-pandemic periods (Orgiles et al., 2020).

It is important to investigate the consequences. This reflection aims to intercept processes and methodologies capable of investigating the most appropriate and effective relationship in the educational field between body and technology, starting from the fact that the body, opening to the process of subjectification in the hybrid era for an existential understanding of our sense of presence mediated (Cipolletta, 2021), allows the fusion of classical and contemporary perspectives in a very innovative way, between the analogue and the virtual space. The challenge of polyphonic and syncretic representation in the heart of teaching and research seems to coincide precisely with what Pier Luigi Capucci calls 'Third Life', describing with this expression all those forms of life created by human culture, while the 'First Life' is the biological life and the 'Second Life' is the life in the symbolic.

An interesting relationship between body and technology in education is represented by the so-called immersive arts that, representing an interactive experience between body, work and environment, constitute indeed a significant experiential immersion that generates emerging phenomena creating through the fruition of the work a symbiosis between man and the machine (Cipolletta, 2021).

A clear example of what is investigated is the installation "Ubiquo. Anatomy of Thought", a work inserted in the official palimpsest of Leonardo500 proposed by Lucrezia Zaffarano and Andrea Sartori, who as central themes of their artistic dialogue address the poetics of presence and absence. This is a multisensory exhibition created in Orvieto in 2019 by the Luca and Katia Tommassini Foundation active for years in studies, analysis and experimentation in the educational field, in an interdisciplinary perspective and with digital methodologies. The aim of the exhibition is to provide the public with knowledge of the anatomy of the human body through a direct immersion in multimedia works. The work, inspired by Leonardo Da Vinci's Vitruvian Man, using the cubit as a unit of measurement, reproduces the forms containing Leonardo's ideal man: a square of size 1.78x1.78 m. and a circle with a circumference of 2.15 m whose intersection allows viewers to freely place themselves within it. The positions taken by the users are detected by sensors that activate the video projection of the geometric and anatomical construction of the body, according to the proportions defined by Leonardo's drawing. The audio, combined with the sensory fruition of the work, is activated by the detection devices and tells the story from gesture to word, from image to symbol. This experience, in fact, has no meaning in dematerializing interpersonal and intrapersonal relationships, but attests to a complex psycho-corporeal network of optical and manual connections, surely cere-

bral and imaginary, that move even in apparent immobility the experience of the subject in a strategic and certainly effective. Even in areas where the body is used as a form of communication in a performative and representative key, an experiential education to proprioception and knowledge of the body and its motor patterns seems to remain accurate and fundamental.

American choreographer Merce Cunningham in *Computer and Dance*, a video interview recorded immediately after creating *Biped* (1999). He argues that in the second half of the 20th century dance and new technologies met on the common ground of the creation and perception of images and how distance increases the dancer's knowledge and experience of action (Monda, 2018). In fact, the history of Western dance teaches how the forms of extraction of movement from the body of the dancer and the systems of choreographic notation starting from the system *Chorégraphie, ou l'art de décrire la danse par caractères, figures et signes démonstratifs* of Beauchamp-Feuillet of 1700, have always been conceived as instruments to help the master and then the choreographer-dancer to fix and memorize the movements, therefore deprived of their expressive and artistic autonomy. From after Cunningham, on the other hand, the use of digital technology seems to have gone towards the apparent paradox of a dance without dancers, an idea already dreamed and partially put into practice by the Italian futurists of the early twentieth century albeit with the technical limits of the time (Monda, 2019). In 2020 choreographer Jilles Jobin, director of the company The Digital Dance Company, created *Cosmogony*: a performance made with a live performance of three dancers whose gestures are processed through the process of recording the motion capture movement from the company's studio in Geneva and projected in real time to look like avatars for a worldwide audience in Singapore.

The three dancers have therefore governed the movements of their body in the presence but have also governed the movements of their bodies dematerialized in avatars: ubiquitous and simultaneous, complex and connected, thanks to the tools of a conscious proprioception, delivered to them by the study of a psycho-motor activity such as dance. The conscious approach to the movement, again, seems to be priority and indispensable, also where the contribution of new technologies such as motion capture transforms the relationship of the dancer with his own body into a medium through which the artist transforms his image into a new presence, in which the body remains a malleable and transformable matter (Cipolletta, 2021).

The conscious approach to movement through the instruments of physiodance and dance workshops, is a condition that will be essential even when the contribution of new technologies such as motion capture will become common use for learning dance. Despite the transformation of the dancer's relationship with his own image/avatar, the conscious proprioception can never be replaced (although implemented by digital devices), precisely because only the dancer possesses that body that creates and makes dance exist (Albano, 2023).

3. Proprioception and new technologies

In the light of these considerations, this reflection seeks to open a question mark on the pedagogy of the body in the field of education. Starting from the assumption that a holistic education of the person remains fundamental, because it has been amply demonstrated that it fosters meaningful learning by guaranteeing homeostatic development of the person, «obsolete now seems to us a way of understanding and doing education only concerned to classify, sort, analyze, design, solve without con-

sidering what at the same time you imagine, feel, try, move in us» (Gamelli, 2006, p.11), one wonders if the potential of the connection can replace the tools of proprioception (ideokinesis, experiential anatomy) in the education of the body. Through experiential practices of conscious approach to movement one can, in fact, develop the holistic and not merely mechanistic knowledge of body language, in order to free the body's expression from damaging muscular and psychic tensions and to give the human being a use of the body and quality movement (Bernard, et al., 1999). The school, as an educational community, supports the task of teaching to learn that of teaching to be, inspiring its action to principles of loyalty, collaboration and mutual trust in the perspective of the formation of the individual in a holistic way. It is necessary, therefore, to create an authentic relationship that is not limited to purely informative exchange, but finds its full realization in sharing, in welcoming, in understanding themselves and others. In this dimension, the resulting dialectical exchange has the aim of achieving the realization of a learning/teaching environment of "co-sense".

The principle of meaning, understood by the physiologist of the Collège de France as the aim of the biological process, is a rule that, focusing on the link between sense and act and redefining the relationship, refracts its meaning: the foundation of this principle is the act itself «since the simple solutions are guided by an intention, an end, a function» (Berthoz, 2011, p. 21). Meaning, therefore, synthesizing and understanding in itself all the other principles, places in a position of importance and centrality the body form that, even in the orientation action, represents the prerequisite for experiencing the world» (Sibilio, 2015, p.333).

The class, therefore, becomes a social microcosm in which the student becomes a conscious and legitimate member, through a greater identity of the ego through us that provides him with social consciousness, a sense of responsibility, respect for rules and shared decisions, spirit of initiative and solidarity, critical capacity. The bodily experiences lived must serve to socialize and to tell oneself externally «[...] because the body is the measure of the limit, its awareness is also the indispensable condition of every possible transformation» (Gamelli, 2016, p.53).

4. Conclusions

However, in the light of the European and national regulatory framework and current scientific research, it is clear that using bodily practices as a vector of knowledge and self-knowledge still seems to be little widespread within the school context, which looks, instead, at the development of the individual through motor practices of a performative type aimed at mere physical performance. In the process of reforming the educational system, schools, playing more than ever a role of proposing and implementing new perspectives, capable of providing effective responses to the now diversified training needs in a scientific context, social and political, requires a constant adaptation of knowledge, skills and professional content. The promotion of life skills and coping with complexity through a holistic education of the person promotes the development of proprioception that at the same time improves:

- the methodological and teaching skills of teachers;
- the perceived self-effectiveness of teachers and learners;
- relations between teachers and learners;
- implements the inclusive actions by providing the opportunity for all students to experience their potential and accelerate their own educational de-

velopment and then to stimulate through the body a maturation not only somatosensory, but also emotional and psycho-social.

From a perspective close to the Papertian constructionism, the school should provide for the establishment of dance workshops in schools of all levels in order to provide an education that uses physical-motor training for the development of psycho-physical wellbeing aiming to correct wrong attitudes as well as improve, in a holistic way, the perception of self and body with the right structural and dynamic balance (MIUR, 2010).

In conclusion, it seems appropriate to reiterate what Dominique Dupuy asserts (2019, p.14): «it is the dancer who does the dance, he is the dance that is being made, he is the dance. The dance master is not there to make a good instrument, he is there to awaken the spirit of the man who starts dancing. There is no dance if the dance does not emanate from the spirit of the one who dances. Everything else is just gymnastics, gesticulation, figure.

Dance is the creative act of those who are preparing to dance, who have made this decision in his heart and who are about to face an unprecedented risk, that of throwing out more than making the demonstration more or less proud of his dance, uses more or less narcissistic exposure. Dancing is the ambitious and daring choice of the one who decides to be without a word».

It seems clear, therefore, that conscious proprioception, even if implemented by digital devices, can never be replaced because it is only the body that creates and makes the movement live because it is only the gesture to inhabit your body also as a critical capacity with respect to the self as a body.

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