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Book of Proceedings




IDELSON-GNOCCHI

“SPECIAL MEDICAL PEDAGOGY: DIDACTICS, SPORT AND DISABILITY”

Editorial Series directed by

PROF. DOMENICO TAFURI



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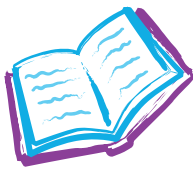
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9.00 REGISTRAZIONE SEGRETERIA

9.30 SALUTI AUTORITÀ



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10.30-12.30 RELAZIONI



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EMBODIED COGNITION. THEORIES AND APPLICATIONS

Prof. **Domenico TAFURI**

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SENSORIMOTOR SYSTEM AND SPECIAL EDUCATION

Prof. **Gaetano RAIOLA**

Università degli Studi della Basilicata

SPORT TRAINING AND DISABILITY



Dott. **Davide DI PALMA**

Università degli Studi di Napoli "Parthenope"

DISABILITY MANAGEMENT

12.30-13.00 DIBATTITO E CONCLUSIONE DEI LAVORI



La S.V. è invitata a partecipare all'Evento Scientifico

International Conference on Special Education and Sport Pedagogy

Martedì 24 maggio 2016 ore 9.00

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Sensorimotor System and Special Education

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In the nineteenth century, it has been highlighted the sharp distinction between theory, intended as knowledge, and practice, intended as production of artifacts (Luhmann, 2005). This paradox has stretched out over time, so as to become an integral part of the cultural *paideia*. In fact, between theory and practice there is a clear conceptual distinction, only because, as Bukharin shows, "*the action becomes knowledge and knowledge enriches practice*" (2007). The same relationship, being limited to the field of education, especially in special didactics and education, involves the continuous research of the elements enabling and influencing the theoretical-practical learning, verifying to what extent practice could support theory and how theory can support practice (Timothy, 2002). In full respect of the teaching/learning process concept, the above-mentioned conceptual scenario can be envisaged for the figure of the teacher; in parallel, for the learner, theory and practice are reflected through a qualitative, not mathematical, proportion, which sees theory relating to cognition, as well as practice relating to action.

In this framework, it should also be added the contribution of neuroscientific research that has opened an interesting scientific-cultural path even for didactics. In fact, thanks to the technological development of functional neuroimaging, it has been shown that between theory, i.e cognition, and practice, i.e action, there is an unbreakable bond: the body (Sibilio, 2007).

A body intended as an "instrument" allowing cognition and action to enter into contact; a body as a neutral and common ground where continuous exchanges of information between the two entities take place (Berthoz, 1998). A body in which, thanks to the nervous system, constant structural changes occur through the influences of the actions and knowledge themselves; changes that are not isolated, but that represent a virtuous circle within which other changes occur, leading, in turn, to changes to actions and knowledge, returning then to the nervous system itself and rebooting it.

This phenomenon should be recognized as Embodiment, within which the sensorimotor system gains a value that goes beyond its undeniable biological functioning. If the researches carried out by luminaries in neurobiology have taught us about the real mechanisms of the sensorimotor system, neuroscientists, starting

with Vittorio Gallese (2005), have related these mechanisms to social relationships, in order to try to understand the scientific justifications of the human behavior.

Among the most important discoveries, that of the mirror neurons has provided the opportunity to make subjectivity spring from intersubjectivity on a sub-personal description level. The sense of self is prematurely developed, starting from a self that is, first of all, physical and corporeal, and that is made up precisely of the possibility of interacting and acting with the other. It is in this scenario that the role of the sensorimotor system has acquired meaning and attention (Gallese & Lakoff, 2005).

The motor simulation, promoted by these neurons with “mirror properties”, is probably the neural correlate of this human faculty that, in functional terms, can be described as “embodied simulation” (Gallese 2003, 2005, 2011; Gallese and Sinigaglia 2010). The functional architecture of the embodied simulation seems to be a key feature of our brain, making our intersubjective experiences rich and diversified, and that constitutes the basis of our ability to empathize with others.

The issue of diversity invites us to reflect on how nowadays it is important, starting from the semantic value of these researches, to promote an inclusive didactics that meets equity and appreciation of differences (Ianes, 2006). To do this, a short attention should be paid to the evolution of cognitive psychology that, in accordance with the solid empirical theories, tends to develop interdisciplinary research with the contribution of neurosciences today.

Until about twenty years ago, in fact, the dominant approach in psychology and in “classical” cognitive sciences understood mind and cognition as the product of a translation process from sensorimotor experience into a symbolic, abstract and amodal code. Mind was understood as a computer software: it was considered important to investigate its operation without investigating its connection with the hardware, the brain and the body (Borghini and Iachini, 2002).

Today, things have changed. In fact, it is no longer possible to think that we can study the mind without taking into account the fact that cognitive processes are influenced by the brain and the body in general, its constraints and the opportunities it offers. Similarly, the idea that there is a close interplay in the relationship between perception, action and cognition has been affirmed. Indeed, this has led to invalidate the distinction between processes that were traditionally considered to be low-level, such as perception and action, and high-level processes, such as thought. The traditional cognitive sciences metaphor, according to which mind is conceived as a sandwich, in which perception and action are marginal and peripheral with respect to the “substance”, i.e cognition, has been so discarded by many (Hurley, 1998).

Therefore, we have come to recognize and enhance this interplay and interaction between the subject as a whole and the environment, a continuous, constant, incessant and retro-informational renovation cycle, which continuously involves actions and cognitions through the body.

But what kind of implication is determined through the body in special education?

Activating a meta-cognition (Cornoldi, 1995) that starts from the knowledge of the system itself and that is composed of body, cognition and action in interaction with each other, means soliciting such mutual influences that fall inevitably on the learning process (Gomez Paloma, Damiani, Ianes, 2014). It means allowing those subjects with special educational needs (SEN) (Ianes, 2008) to have greater awareness of their own bodies in order to learn about the mechanisms activated during cognition and action, understand the functioning of this complex system to self-evaluate the strengths and critical points of the process itself.

From the spring of the literary movement of pedagogical activism it has been affirmed that learning, to be such, must be experienced first-hand by the subjects (Dewey, 1928). The pupil's activity is central, conceived as a strategy of an alternative kind of learning with respect to the traditional learning-by-problems method (Burza, 1999). The inclusive didactics, today recognized as a qualification of the ordinary didactics, must make use of these principles resulting from the Embodied Cognition (EC) (Gomez Paloma, 2016) in order to make the process less abstract, more situated, thus, closer to the subject.

Therefore, the most appropriate teaching model to reverse this condition is the one that is justified on strong neuroscientific principles, recognized as strongly related to the environmental stimuli and that lead to frame cognitive processes as dependent in the sensory-motor system. In this way, the dimension of the perception and that of the action run in parallel (Gomez Paloma, 2013). Thanks to theory of the EC, which refers to a broader conceptual system, the mental process is not the only answer to the representation of the world surrounding us. The central role of the body has allowed to understand this as an additional resource for the solving of tasks, so that the subject does not use his mind as the only instrument of action. This conception has its foundations in the theory of the EC itself (Gomez Paloma, Raiola and Tafuri, 2015).

It is a principle that enhances the corporeal biology of a student's organism (Embodied) as the mental process generator (Cognition), thus the entity with which to deal every time the educator wants to intervene on the learning processes, including those that are object of specific disorders.

Entering into the details of the employment of this theory in special education, if on the one hand, in the specialist field, all trends consider the disability as a specific neuropsychological organization deficit (therefore, not resulting from a

neurological, cognitive, relational and social deficit of the subject), on the other hand, in schools, there are still conflicting and confusing opinions about the nature of the detected learning difficulties. Without prejudice to the fundamental discoveries about the existence of neurobiological disabilities not deriving from the subject's external and/or psychological factors, we cannot underestimate the role of environmental factors in their manifestations and in the outcomes on the subject's overall development (Damiani, 2013).

Many difficulties could perhaps be explained as difficulties for the system, and for the teacher in particular, in looking for and applying models allowing these subjects to express themselves. And what if there were too many cultural, methodological and evaluative standardizations, inhibiting potentialities and abilities that could arise from other models? Perhaps, to answer these questions it is necessary to consider the possibility to understand if there is scientific basis for renewing didactics in respect of the body-mind-environment interplay that, according to a mutual conditioning, open an innovative scenario in the field of the issue of the special educational needs, both in terms of the biogenesis of the problems and in terms of the compensatory didactic action, according to the principles originating from the EC (Wilson, 2002).

Among other things, very often, an untimely correct analysis and the limitations arising from poor educational outcomes at school contribute to the establishment of dangerous secondary psycho-pathological factors in a child's development. It is well known that a prolonged failure generates low self-esteem, psychological distress, strong demotivation to learn, inhibition, aggressiveness, histrionic attitudes of disturbance to the class and, in some cases, depression. Although being individual disabilities depending on unmodifiable congenital factors, in certain circumstances, in most cases (to an extent dependent on the severity of the deficit) they can be reduced with appropriate rehabilitative and educational interventions.

The problem is basically due to:

1. the earliness of an analysis according to a multiperspective interpretation;
2. the limited awareness of schools on the real sense of repercussion that such a learning process could have.

More specifically, in summary, for what concerns the issue of earliness, the objective is to define actions aimed at reducing the probability of school failure through targeted and specific early interventions of analyses, employing a multidisciplinary approach. The latest scientific research, particularly in the biomedical field, show clearly and with a quite good level of certainty that the forms and causes of the difficulties of subjects with special educational needs, particularly those affected by specific learning disabilities, are multiple, complex and articulated and manifest themselves according to specific characterizations linked also to the sub-

ject's genetic evolution; therefore, there emerges the need to analyze the disability in all its complexity in order to plan concrete preventive actions, even in the long term (Pastena, D'Anna, Damiani, Gomez Paloma, 2015).

Instead, for what concerns the problem of consciousness, it needs to orient the teacher training on the basis of the illuminated paradigm of the EC, which affirms that the learning process only makes sense if it starts from the enhancement of the sensorimotor system, therefore from real tasks, thus developing for the purpose of being applied in life. Currently our model still orients the process towards disciplinary and content objectives. In fact, it's in the wake of this model that children with special educational needs are very little guided towards creativity and the development of personal propensities.

Based on these considerations, we can come to a conclusion by justifying the need to activate a strong connection between a valid multiperspective approach for the identification of cases at risk since the early years of schooling, and neuropsychological principles that underlie the paradigm of the EC, in which the biogenesis of the difficulties must not be interpreted as an absolute etiological justification, but as a the inclination of the corporeal biology towards the development of possible issues. Corporeality itself should be interpreted in the same way (Ed. Gomez Paloma, 2014), as an indispensable entity for the activation of a learning process with a real and significant relevance for the acquisition of skills.

This view allows to orient the teaching-methodological choices and reflect on the elements of the EC that could facilitate the teaching-learning process.

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Ascione Antonio	p. 82
Conte Umberto	p. 82
Dàvid Maria	p. 13
Di Palma Davide	p. 51
Gomez Paloma Filippo	p. 25, 34
Madonna Giuseppe	p. 64, 88, 102
Molisso Vittoria	p. 64, 88, 102
Napolitano Salvatore	p. 58, 74, 93, 111
Raiola Gaetano	p. 40
Sciacovelli Antonio Donato	p. 9
Tafari Domenico	p. 25, 34, 40, 51, 58, 74, 93, 111
Tòth Agnes	p. 13

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