*Chapter 8*

# EMBODIED COGNITION AS INCLUSIVE APPROACH FOR SPECIAL EDUCATIONAL NEEDS

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## ABSTRACT

"There was a time when mental meant nonphysical, but we are past that belief. Mental processes and states are physical products of the brain. "(Le Doux, 2015, p.170). The time has come to rethink education in the light of new scientific discoveries. The proposal for an approach to an inclusive ECS-based didactics doesn't want to be final or prescriptive, and probably it cannot even be defined as a real approach. Our attempt is to systematize some interdisciplinary contributions in order to provide insights for the planning of more effective training courses, able to facilitate learning and participation processes in all students. The ECS approach is in line with the existing models and theories of development and learning, based on a complex psychodynamic and neuroscientific anthropology, which identifies the construct of neurodiversity and casts an eyes over the Special Educational Needs.

**Keywords:** special educational needs, inclusion, neurodiversity, embodied

## INTRODUCTION

Improving educational and social inclusion is a key objective on a worldwide level. Political and economic surveys recognize, in the fight against early school leaving and the improvement of learning-inclusion processes, the factors for promoting the development of individuals and society. School has a fundamental role also, and above all, for its educational and didactic mission. The latter, therefore, must be appropriate, strengthened and renewed, in order to ensure that all students can learn, participate and feel good at school.

Today, the crisis of the school system all over the world and the major social, economic, cultural and scientific changes are slowly but inexorably redefining the paradigms of

individuals' development, learning and training. A point of no return is the recognition of the need of all countries for an inclusive school.

Therefore, the challenge is not so much to promote change towards new models of school and didactics, but to reflect on the directions and meanings of the drivers for change and innovation processes which, from time to time, redefine didactic practices and cultures, in a more or less inclusive sense. A first element to be considered is the problematization of the concept of inclusion and inclusive didactic itself.

## WHAT IS INCLUSION? WHAT ARE SEN? FROM THE ITALIAN EXPERIENCE TO THE EUROPEAN APPROACH

Studies and research on students' Special Educational Needs and the inclusion in schools have increased exponentially since the beginning of the new millennium, and have involved different disciplines. The concept of SEN originated in English-speaking countries while, in France, one of its less well-known equivalents was being adopted (BEP: Besoins Educatifs Particuliers). Besoins Educatifs Particuliers). According to what British documents[1] state and most of the English-speaking countries acknowledge, Special Educational Needs and disabilities can affect a child or young person's ability to learn. They can affect their behavior or ability to socialize, e.g., they struggle to make friends; their reading and writing capabilities, since they have dyslexia; their ability to understand things; concentration levels, e.g., because they have ADHD; their physical capacity. “Special Educational Needs” may be considered an umbrella term for an aspect of school education focusing primarily on students with learning difficulties and/or disability. In school documents, it is abbreviated to 'SEN' or 'SEND' – these abbreviations were first used in Commonwealth countries such as Australia and Singapore. The term covers specific learning difficulties such as dyslexia and ADHD, pervasive disorders such as autism, and physical disability such as visual impairment and hearing impairment.

In United Kingdom, education law dates back to the Education Act 1944.In the United Kingdom, education law dates back to the Education Act 1944. Over three decades later, this was followed by the Warnock Report in 1978 an Inquiry into the needs of SEN children. This laid the foundations for the introduction of Statements of Special Educational Needs in England and Wales through the Education Act 1981.We have now entered a new era for SEN with the introduction of Part 3 of the Children and Families Act, the new SEN Code of Practice 2014 and associated regulations. This new legislation now replaces Part 4 of the Education Act 1996 and its associated regulations.

The definitions of special educational needs and special educational provision remain roughly the same as they were before. However, as well as children, ‘young people’ are now referred to in their own right if they are over 16 years of age (at least at the end of the academic year in which they turn 16). It is again still not counted as SEN if a child or a young person has a different home language as before, although now health and care provision can be considered as special educational provision, where it is provided for educational or training purposes. There were many criticisms of the SEN framework between 2006 and 2010, with five different Inquiries on SEN and Disability issues. For example, in 2006, the Education &

[1] https://www.gov.uk/children-with-special-educational-needs/overview.

Skills Committee said that the SEN system was 'not fit for purpose'. One of the final nails in the coffin for the previous SEN system was a critical Ofsted report in September 2010 entitled 'A Statement is not enough'. Section 19 requires the LA to have regard to: (a) The views, wishes and feelings of the child and his or her parent or the young person (b) The importance of the child and his or her parent or the young person, participating as fully as possible in decisions relating to the exercise of the function concerned; (c) The importance of the child and his or her parent or the young person being provided with the information and support necessary to enable participation in those decisions; and (d) The need to support the child and his or her parent or the young person in order to facilitate the development of the child or young person and to help him or her achieve the best possible educational and other outcomes. Authors underline the last part – the need to help a child or young person achieve the best possible educational and other outcomes[2].

The topic of SEN, therefore, is closely related to that of their overcoming/reduction, and that of school and social inclusion. The still-open debate on the more "appropriate and beneficial" model of inclusion for the current school is fertile and full of variously articulated contributions, according to concepts and ways that are not always convergent. All EU countries aim at achieving an inclusive school according to the guidelines set out in Europe 2020, but the daily practices underlie paradigms that may result distant and problematic. The very concept of inclusion is not easy to define and has given rise to different interpretations.

Also the term inclusion originated in England in the 1990s, and is a key concept that has been largely taken up in the following decades by all UNESCO documents and most of the studies and research in this field. In Italy, the word "inclusion" has been acquired and used by the majority of professionals and families only in more recent times, and must be interpreted, within the dialectics, with another key concept own of the national tradition: that of integration. Inclusion should be seen as something we adhere to, in the name of the experience of integration supported by the Framework Law 104/92, "a law that makes all the countries in the world envious of us" (Caldin, 2010).The concept and practices of inclusion are exclusive of the Italian social and cultural context and its historical development (Armstrong, 2007), and are a privileged way for achieving an inclusive process. According to various authors, the study of inclusion is privileged in the Italian context than in other international realities, which have not launched the full integration of children with disabilities in schools and in common classes yet. In fact, although considering the idea of inclusion as full inclusion and inclusion for All, thus not only for SEN students, the focus of the practices and processes related to weak children and young people who need "additional" aid allows to bring out the characteristics (also in terms of strengths and weaknesses) of the models for assessing the needs and those of the adopted interventions.

Among the critical issues related to the use of the SEN construct there is the awareness of using a quite outdated term, always referred to the individual and his difficulties, while it would be more interesting to adopt an expanded perspective that identifies the obstacles to learning and participation related to the context in which the individual lives, studies and works (Caldin, 2010). Indeed, whereas the Italian model of integration / inclusion is an advanced and pioneering model for many countries today, the fact of having the most advanced regulatory framework in Europe does not guarantee the quality of integration and inclusion achieved at school every day (Canevaro, 2016). Unfortunately, in our school and

[2] https://www.specialeducationalneeds.co.uk/

training systems, there's the risk of turning the law on school integration into a “schizophrenic law,” which declares excellent principles that are not matched by best practices. The Italian experience has basically taught us that it's not possible to enclose statically and comprehensively a complex and dynamic process like that of inclusion, within a concept and related regulations. “Inclusion is a regulatory ideal and process, a kind of utopia to which we aim, meaning that it retains its unattainable nature: it is something that pushes us to evolve, a sort of driving force that helps evolve” (Caldin, 2010, pp.3-4).

According to Canevaro and Malaguti (2015), the concept of school and social inclusion refers to a sphere of thought and research that cannot be attributed to a single model or the mere school integration, but to a basic theoretical position that wants to put a stop to any form of social, institutional and educational exclusion and segregation; moreover, it requires to focus attention not only on the individual and his disabilities, but on the actions, the skills and the context. From this point of view, it calls for a change in the current social, educational and school system, in order to allow for the full and active participation of all individuals, including the disabled ones. In Italy, and today in Europe and all over the world too, there has been a process of interpretation which may be seen as a continuum from exclusion to inclusion and integration.

In this sense, inclusion can be better described as an ethical imperative that needs no justification: it is a principle and a direction for including all people through a continuous process. From a pedagogical standpoint, inclusion is a value at the foundations of a philosophy aiming at maximizing everybody's participation in society, and minimizing the practices of exclusion and discrimination (Caldin, ibid.).

In line with this perspective, the European Agency for Development in Special Needs Education document (2012), which defines the profile of inclusive teachers, affirms that the imperative of inclusive education is to develop student's autonomy to the highest possible extent, and ensure that all students can develop their social relationships in order to have support networks within local communities. The document includes also the different interpretations of the concept of inclusion by authors from different countries, a demonstration of its inherent complexity and multidimensionality.

The European Agency for Special Needs and inclusive education includes Agency member countries’ ultimate vision for inclusive education systems, to ensure that all learners of any age are provided with meaningful, high-quality educational opportunities in their local community, along with their friends and peers. All European countries are committed to working towards more inclusive educational systems, but they do it in different ways, depending on their past and current contexts and histories. Inclusive educational systems are seen as a vital component within the wider aspiration of more socially inclusive societies that all Agency member countries align themselves with, both ethically and politically. More specifically, the document outlines the essential characteristics of inclusive educational systems that will be employed to guide the development and the direction of the Agency's activities in the medium-long term. The goal of this document is to guide the discussions on the Agency's activities supporting the countries in their efforts to develop more inclusive educational systems, in order to ensure that all students of all ages can have high-quality significant educational opportunities in their local communities, along with their friends and peers. In order to have this vision implemented, the legislation governing inclusive educational systems must be supported by a fundamental commitment to guaranteeing the right of every student to inclusive and fair training opportunities.

The operating principles guiding the implementation of structures and procedures within inclusive educational systems must be those of equity, effectiveness, efficiency and improvement of the outcomes for all stakeholders - students, their parents and families, the education professionals, the representatives of the community and decision-makers - through high-quality and accessible training opportunities. Two strong value pairs that define the frame and the sphere within which to take measures emerge: inclusion and equity, education and community. These are principles/values that assume a strategic orientation dimension: it needs to have significant high-quality educational opportunities, in the local community, to be able to realize them.

## IMPLEMENTING INCLUSIVE EDUCATION SYSTEMS

Once highlighted the need for change towards education and training systems that are increasingly and genuinely inclusive, the issue of the effective implementation of such change within a flexible and problematic perspective remains unresolved, which contributes to highlight risks and opportunities of the possible trajectories.

School definition and practice of inclusion can change significantly, not only among cultures and educational systems, but also within them (Dyson, 1999).It is appropriate to speak of *multiple versions of inclusion*, thereby giving meaning and importance to a discourse on “inclusions” considered in the plural. It is essential to maintain openness also towards unexpressed and unexpected possibilities (Canevaro, 2016).Therefore, it needs to broaden the focus from the regulatory framework, which establishes the right to inclusion, to the mechanisms of concrete success of cultures, processes and practices that make inclusion possible and real, in order to try to grasp the complex experiential and still unexplored phenomenological dynamics.

The most mature debate on the meanings and orientations of inclusion process highlights the risks related, in particular, to “utilitarian” and reductive visions of inclusion and training. Studies on the social model of disabilities highlight the trends of neo-Fordist approaches based on the economic and management models of the training systems, aimed at controlling production at schools (outcomes) through an accumulation of controllable standards and rules. With respect to the assessment-reporting systems of the educational systems, the comparisons at national and international level, and also a vision of inclusion strongly centered on early assessment, recovery, rehabilitation and enhancement of the individual's deficit skills, it needs to pay attention to the perspectives reducing education to procedures ensuring to get good grades in some specific areas (language, math, and sciences), forgetting that the most relevant skills for a learning society refer not to technical knowledge (which quickly becomes obsolete), but to the ability to develop meaningful relationships founded on equity (Dovigo, 2016). According to Dovigo, these perspectives are reflected in increasingly stringent curricular indications to be achieved in the form of micro-management of teachers’ activities (Hodkinson, 2005; Hyslop-Margison, Sears, 2010), reproposing the idea that “limiting teachers’ initiative will provide more control over the learning process, thereby improving schools’ outcomes.” This direction is drastically far from the objectives of the European Agency we have outlined before, not only for what concerns the inclusive

dimensions centered on the idea of community, co-participation and equity, but also in terms of lack of effectiveness of the teaching-learning processes.

In fact, research seems to show that some significant students' achievement of skills, such as the development of decision- making and problem-solving skills, require a creative and flexible approach by teachers. Not surprisingly, in the world rankings of the educational systems, the most successful countries are not “those obsessed with standardization of curriculum and micro-management of classroom activities, but those that consider curriculum as a fully adaptable platform, give ample room to innovative teaching and flexible learning, and respect teachers as highly qualified and respected professionals” (Tschannen-Moran, 2004, in Dovigo, 2016).

The theoretical and research perspectives proposed by the Disability Studies have been founded on emancipatory methodologies. Such approaches have put radically into question the ideological horizons that guide professional-medical research on disabilities (Oliver, 1991).The social model of disability originates from the distinction between impairment and disability (UPIAS, 1976); the first term refers to a person's condition, while the second shows the constraints that affect the life as a result of a skills-based organization of society (Valtellina, 2011).The social inclusion model focuses on the role of the community dimension and co-participation for the change in complex systems like educational organizations; change is a dynamic activity emerging through a process of social construction based on sense-making and enactment, which allows actors to develop their way of thinking about organization, to bring organizational structures and events into existence, and to put them in action (Weick, 1995; Weick, Sutcliffe, Obstfeld, 2005).

An interesting element for the purposes of our investigation refers to the fact that also in this perspective, according to which the role of society and culture is central, organizational change theories are based on the key dimension of reflexivity as deep personal reflection and often inadequately ensured dimension, about which we will talk in the next paragraph.

## WHICH FRAMEWORKS?

Returning to the privileged experience of the Italian model for integration/inclusion, we want to base our work pm the concept of special normality worked out by Ianes (2006), which has provided the background for the framework of the Special Educational Needs of our country (in Italian, BES: Bisogni Educativi Speciali), as it's based on the biopsychosocial model of the ICF and is in line with the most recent European guidelines.

In fact, the assumption of the SEN construct, a pedagogic-political and not diagnostic-healthcare construct, is functional to the reconceptualization of the idea of disability carried out by the ICF.As pointed out by Ianes, what characterizes these students is not so much a medical or psychological diagnosis (a “certification”) but a somehow difficult situation that requires individualized interventions; in that sense, the description in terms of Special Educational Needs is more fair and efficient in the assessment and recognition of the student's real needs. Furthermore, the concept of SEN is very close to that of learning disability meant as “any difficulty found by a student during his school career” (Cornoldi, 1999, p.7). Different problematic situations are thought to be due to a varied complex of individual and contextual causes, according to a model consistent with that of the ICF. SEN students are

living a particular situation that hinders their learning and development process: this negative situation can be organical, biological or familiar, social, environmental, contextual or all these combined with each other. The description of the way of acting of SEN student, according to the ICF model, must depend on the description of the relationship between the student and his context. In the biopsychosocial paradigm, the concept of interaction between the subject and his environment, through a multidimensional approach, is central. For the student with disabilities (or impairments), in order to be motivated to learn, it is necessary that learning increases his expertise and provides him with a pleasant feeling of mastery and self-esteem, starting from the changes in the context. Thus the specialized response becomes ordinary: all students are different and everyone can learn; learning intensifies with the cooperation between teachers, parents and communities of which they are a part[3].

In pursuing the inclusive perspective, Special Education sees it as its task to ensure that what a person living in a problematic situation achieves becomes a quality for all. At school, this translates into a commitment of all stakeholders to promoting strong literacy for all students, greater access to education for all school grades, the equal right of all children to quality education, within the same community in which commitment and participation are also required to disabled persons (Caldin, 2010). In fact, it is no longer possible to think of just one instrumental literacy regardless of the common good, or better, without considering the inclusive perspective from an eco-systemic stance. The latter, in fact, implies an anthropological model that protects all the people and concerns all students equally, but, at the same time, it considers them differently, because everyone has the right to be supported in the development of his specific potentialities. Therefore, the anthropological paradigm of the ICF and the eco-systemic approach facilitate the inclusion process of SEN students, but allow us to go further towards the inclusion of all students.

In the ICF model, the attention to the relationship between the person and the context, according to the different conditions facilitating or hindering the overall functioning of the person and its implications for the modification of the context, is a general key principle. This attention can be interpreted as “essential good practice” and, as pointed out by Ianes, “a good practice is not a heroical act, but an efficient modus operandi available to all.” So, the problematization of the very concept of “special” applied to didactics and pedagogy seems to be justifiable; inclusion cannot be a “special” value.

Current debates in educational psychology questions whether inclusion must be special or not. Rix (2015) has recently analyzed the broad range of interests linked to the emergence and ongoing development of educational systems across many countries. He pays particular attention to systems associated with special and inclusive provision, and the kinds of pressures under which they operate. He questions the theoretical perspectives associated with them, challenging the dominant focus upon the individual, explaining how and why we must increase our focus on context.

Challenges and possible solutions are evident within many education systems and their wider socio-economic environment. They suggest how educational support might better respond to disparate aims, and be developed within a community of provision. This notion recognizes the interconnectedness of services and the significance of context; encapsulating the aspiration of much international legislation for participation and inclusion for all. As a tool for describing interrelated contexts, this notion of a community of provision can help us

[3] Slides can be found at: http://www.unirsm.sm/media/documenti/unirsm_1714.pdf.

frame necessary shifts in pedagogy, assessment and funding; it can encourage collective learning processes and collaborative outputs; enhancing our capacity to create equitable participation for all whilst responding to predominant socio-economic demands. It emerges from the research base which problematises inclusive, mainstream and special education.

The assumption of the ICF model goes beyond the simple vision of disability and promotes the creation of an education system as a privileged place where to ensure personal development and social inclusion, by virtue of the highest degree of autonomy and freedom to learn and participate. The educational system is the first step towards a society of integration and inclusion (Declaration of Madrid, 2002, Art. 7).

However, we know that the creation of educational systems promoting inclusion is a strategic objective on which it needs to invest so much more culturally and practically. In particular, it needs to promote and support change processes that go down this route. Such a change must be made at macro and micro level; in the pedagogical model, school inclusion must help the student become the promoter of his own project and care, and must stimulate the individual to be himself, without feeling influenced by others as much as possible. Inclusive education employs functions of control, comfort and socialization, but it also employs empowering incentives, aimed at their separation and autonomy, promoted by teachers and school but launched and strengthened in their families[4].

At micro level (of educational institution), an aspect that is still too overlooked refers to the circularity among the learning organization. The advanced models of changes in the organizational learning, such as that on the "double-loop learning" (Argyris, Schön, 1978), contemplate the role of personal deep self-reflection dimensions, which are able to generate new solutions by introducing innovative forms of adaptations; this type of learning always implies a certain degree of subjective reflection that helps the system learn to learn by systematically questioning existing rules and supporting the attitude of "thinking outside the box." Thus it provides a cognitive explanation on the way reflexivity plays a pivotal role in transforming organizational knowledge (Dovigo, 2016).

Other authors tend to place greater emphasis on the social dimension that learning assumes in organizations as a vector of change, involving also tacit knowledge dimension as an essential attribute of organizational functioning and learning (Cohen, Levinthal, 1990; Collins, 2010; Polanyi, 1966; von Krogh, Ichijo, Nonaka, 2000). Unlike explicit knowledge, which is communicated systematically and formally (especially through written documents), tacit knowledge is mainly personal, based on intuition and built with reference to a specific context. Although this kind of knowledge plays a crucial role, it can be difficult to communicate and share within an organization, but many studies agree on the assumption that a smoother transfer of knowledge would be highly beneficial in terms of empowering organizational management and change (Nonaka and Takeuchi, 1995).In addition to the environmental conditions, as explained in the European document mentioned in the previous paragraph, in order to achieve the objectives and principles of an inclusive educational system, a set of essential abilities for all the involved subjects (stakeholders) is necessary. It needs to effectively develop attitudes, beliefs and reflection capabilities, together with knowledge, skills and behaviors.

To promote the virtuous circularity between learning-change of organizations and learning-change in those who work within them, transnational documents recognize the value

[4] http://www.siped.it/wp-content/uploads/2015/08/Caldin.pdf.

of co-participation and community dimension as a strategic principle, able to facilitate the individuals' development of the capabilities to reflect on their own actions and on the produced outcomes, and to use reflections to improve and develop their collective work towards common goals.

The development of the *inclusive mind* of each person can only take place within a network of virtuous connections with other minds (Bateson, 1972; 1979; Bion, 1961; Siegel, 1999), and minds in relation with each other contaminate and build the organizational mind (Jaques, 1955; Hinshlewood, 1987; Perini, 2007), even and especially in an inclusive direction. Developing the inclusive minds (Damiani, 2014) of teachers, students, citizens, and thus organizational contexts, is a conditio sine qua non for the inclusive school.

## HUMAN DEVELOPMENT AND INCLUSION BETWEEN DIFFERENCES AND EQUITIES

In the light of what has emerged so far, an efficient inclusion model must involve macro and micro, political, social, organizational and personal aspects, of explicit and implicit nature, and their interconnections. Our work focuses particularly on the personal, mental, implicit and emotional-relational dimensions; in fact, scientific research is now recognizing their role in different fields.

Recent studies on the fight against early school leaving and the promotion of well-being at school are redefining a multidimensional framework able to facilitate the complex interpretation of the phenomena in this area, and the implementation of consistent action plans. Research shows that students who are considered different because they fail to follow and / or behave according to what it is “normal to expect,” are students in risk of dropping out. Conversely, the increase of participation and school well-being lowers the perception of diversity and prevents school leaving. As noted by Moreira (2016), to prevent the drop out or promote positive and inclusive paths at school, it also needs to organize positive psychobiological experiences; working on the subjective experiences, emotions, motivations and aspirations is essential to prevent drop out, but it's very difficult to be achieved. It’s about developing multidimensional approaches that consider also subjective experiences (emotions, motivations, well-being), which are involved in determining the way we experience (internal and external) reality and live in it, which is our way of relating to reality (Moreira et al, 2013; Fredricks, Blumend and Paris, 2004).According to Kagan (2013), the lack of attention to processes that account for the striking psychological differences between members of divergent social classes is a second barrier to progress in the social sciences (p.XII).

It emerges a focus on the “mental, deep and complex” sociorelational meaning of “inclusion.” In the conception of the social sciences, the relational feature of the inclusion concept implies feeling respected and valued for who you are, thanks to the supportive energy and commitment from others (Miller, Katz, 2002). These experiential dimensions are closely correlated with a change in the perception of diversity. A broad definition of the relational dimension of inclusion considers it in its “complex” meaning of well-being “within something,” like being part of a larger community, in terms of a psychological state that meets the social and primary and secondary existential needs (Ghedin, 2009).This definition assumes a pro-active and strategic meaning, which helps identify actions to face exclusion by

promoting feelings, moods, privileges, opportunities and rights, gathered under the umbrella term “inclusion.”

The Capability Approach (CA) by Amartya Sen (1999), although developed the field of economy, addresses these issues by investigating the existential, social and institutional conditions which make individual differences become disadvantages, inequalities and injustices or, by contrast, can enhance human development. Sen contrasts the “powerful rhetoric of equality,” believing that individuals are totally different from each other when they come to the world, and that the project of equality must start from the awareness of a significant dose of pre-existing inequality to be contrasted. This perspective assumes a vision of development which shifts the focus from what an individual or a community can produce to what he is able and has the possibility to choose to produce, as something that is worth producing for him; thus inclusion becomes an essential precondition for development. The drive towards equality is directly linked to everybody's freedom and collective freedom; in the Senian theory, freedom is expressed in beings and doings, what it is believed to have value (functionings), that is, what it is worth being chosen as it contributes to one's own well-being, consisting of a flourishing life, a full self-realization (Santi and Ghedin, 2011). The CA is an approach that includes individual differences, including those corresponding to the personal factors mentioned by the ICF, but which are not coded. Indeed, the approach of capabilities applied to disability is based on an idea of well-being, that is, an extended health condition that includes “what the individual can do or can be” starting from the available means and resources, and in relation to the ability of people to transform the means and the resources available in results, achievements and goals. The actual realization of well-being or functionings corresponds to what the individual has chosen to do or be for himself or for others, by implementing his power to act (agency).This approach constitutes the theoretical foundation of the human development paradigm promoted by the United Nations Development Program in the Human Development Reports.

Thus there's a double attention to the person's characteristics (his differences and the psychobiological aspects) and those of the sociocultural, political and economic context emerging worldwide, centered on their virtuous (enabling and inclusive) and vicious (disabling and exclusive) interconnections. The individuals' opportunities of choice and initiative in the context shall be increased equally, but differently, instead of providing indiscriminately the missing resources to meet the needs defined a priori (Sen, 1993 / b, p.31).

Focusing back on the inclusion and well-being processes at school, we believe it is essential to focus attention on personal resources (capability to choose, agency, emotions-motivation), as they're crucial aspects in the development and “capability” process inadequately explored both at the level of description (in the description of the student's overall functioning) and that of application (in the planning of educational and didactic intervention). As the Senian model points out, the personal factors condition the ability to realize functionings; in fact, these factors are conversion factors, in line with the ICF model referred to the presence of facilitating or hindering contextual factors.

Also the inclusive model of the Index for Inclusion (Booth, Ainscow, Black-Hawkins, Vaughn, Shaw, 2000; Booth, Ainscow, 2014) shifts the focus from the SEN to the barriers to learning and the social factors concerning people's active participation; they must be attributed to both the individuals and the contexts. It emerges a nonlinear interpretation of the situations, which recalls the epistemological assumptions of reference (cultural, ethical and value-based), the policies and practices to be define and redefined (Canevaro, Malaguti,

2015).The central idea of inclusion as a relational process, a way of understanding and living relationships, is raised once again (Fornasa and Medeghini, 2012).

From this quick overview, two items of interest emerge: the focus on the relational - personal, interpersonal and sociocultural- dimension of inclusion as an important dimension that applies to different approaches, and the consequent enhancement of the differences of all people. In the relational dynamics, the key element in terms of evolution is the divergent element; it's the differences and heterogeneities that make the development of systems possible. Therefore, the relationship seems to be a sort of “bridging-dimension” between the different approaches, able to facilitate the building of more evolved and suitable knowledge and understanding systems (of inclusive processes and systems).The relational aspect of inclusion, enriched in terms of interdependence and reciprocity, is also developed in modern biology, especially in its holistic conceptions related to a complex vision of the living systems, which has led, as we shall see in the next paragraph, to the identification of the concept of neurodiversity. Also in the inclusive paradigms, the strategic orientation moves towards the recognition and realization of the value of differences.

The challenge facing educational systems is, ultimately, to build an approach to differences; the key concept becomes managing and considering one's own way of being with others according to the synaptic dimension, that is, the possibility for contrasting elements to be reformulated in terms of common, individual and social project simultaneously. A social individual knows how to grasp the features of this management, which supports and enhances his learning capacity. Managing means also understanding that there are different learning strategies, and that there is the possibility, even by using time dedicated to others, to increase one's own capacity. In order to manage and function in a synaptic dimension, we need to stay together, in a time qualified time (Ghedin, 2009; Santi 2015).We must head towards new indicators for assessing the well-being (quality of life) and the quality of training systems, as well as the outcomes: the Missing Dimension (Biggeri and Santi, 2012). To assess the quality of life and inclusion it needs complex reading and analysis models but they are becoming more and more intertwined, and so they require appropriate and largely renewed constructs able to best represent the complexity of the phenomena. In school settings, the change of the idea of inclusion is combined with a change of the idea of support, which becomes extended and widespread (Ianes, 2014 Canevaro, 2011): any activity that enhances the ability of school to meet students' diversities. Providing individual support is only a part of the effort to increase students' participation, and when it is ensured, the need of individual support decreases. A widespread support is needed together with a reward/incentive system, and this entails a global reorganization of the school and its structural, organizational and teachers' training aspect etc, including lifelong learning for all those who are part of the school community (Canevaro, 2008; Sapucci, 2007).

Martha Nussbaum has analyzed the Capabilities Approach and has highlighted the complex and constructive role of emotions, according to an interesting theory that overcomes the conception that attaches the difficulty of change in emotions to the habits and the ancient roots of its related knowledge. It is based on the recognition that it is also possible to ignore completely the nature of our emotions-cognitions, and that we can also make many efforts to leave them unchanged. Our perception, our opinions and beliefs about the object are also determined by not altogether conscious elements. The structures of anger, love, envy, hatred and admiration are very deep, and those of negative and primordial emotions like anger and envy are probably even deeper.

"It would be naive to expect that projections of these negative emotions onto other people will not take place—although we may certainly hope to moderate their number and intensity. My view, then, urges us to reject as both too simple and too cruel any picture of character that tells us to bring every emotion into light with reason's dictates, or the dictates of the person's ideal, whatever that is." The psychological theory of emotion developed by Nussbaum provides the foundation to condemn "those normative approaches as excessively violent toward human complexity and frailty," ranging from an extreme idea of zealous critical surveillance over desire and emotion, including the extirpation of the latter where possible (p.290). It needs to remember that, in the light of scientific paradigms adopted in our work, emotions are also and above all an existential experience of development and knowledge, lying at the foundation of every relational dynamic with oneself, other people and the contexts within which this dynamic develops.

The key point for the pedagogical reflection, which raises the issue of the subject's education in his entirety and uniqueness, is what we should/can do as educators. Today school seems to be ready to accept this challenge. As noted by Cerini (2009), "when it comes to learning context, the idea of school, and consequently that of teacher, has changed: from "didactic teaching" to apprenticeship, tutoring, mentoring and coaching. The daily challenge in the classroom focuses on how to turn the objects of knowledge into objects of authentic and meaningful learning, through an "animated conversation" (or authentic emotional relationship) (Bruner). This not only means starting from the direct and immediate experience, but being on the shadow line between organized knowledge and everyday experience, building a learning environment where to become competent together in a positive group, an "ideal educational community." Planning an "educational" learning environment means connecting educational and organizational knowledge, but it also means rediscovering the centrality of motivation, of emotions, of the action of giving "sense" to the experience in a positive school scenario, in which trust, communication, recovery of communication and support for commitment and efforts prevail "(p).Therefore, the problem of Special Educational Needs can be reinterpreted as "valid reason" for forcing schools to renew themselves in the above-described way, which corresponds to our idea of inclusive education; SEN students "report systemic problems," because their relationship with their school environment makes them "needy" (Rossi Doria, 2013).

Embodied Cognition (EC) can provide significant insights for improving teachers' attitudes and didactics according to the expected inclusive guidelines outlined so far.

Our investigation will focus on those deeper personal factors, which are not very visible and manageable, that are not generally the subject of pedagogical descriptions and policy actions. We have seen how the ability to develop (positive and inclusive) relationships and the ability to choose people are key factors for determining the well-being, but these abilities are based on the development of mind and on complex and deep cognitive processes that are mainly of emotional, corporeal and implicit nature. The awareness of the powerful role played by the emotional-motivational personal dimensions in development and learning is not surprising; however, as well as for inclusion, the knowledge of the deep functionings which come into play is less obvious. As Kagan points out (2013), the puzzle surrounding the relation between bodily feelings and human emotional states continues to evade satisfying solutions; what is clear is the interconnection with bodily and implicit aspects, in addition to those sociocultural ones. Many definitions of emotions and the popular "emotional" words in

all languages are interpretations of bodily feelings, but any word can specify the quality and origin of the feeling and the target of any given behavior (ibid. P. XI).

Adopting the EC model allows us to focus our attention on those aspects that are still very little explored (missing dimensions). Of course, this does not mean ignoring the role of cultural and environmental factors in the capability and inclusion processes at school; however, they have already been investigated and enhanced by approaches that are also recognized in the educational and didactic field today, such as those of the Full Inclusion, the Disability Studies and the Universal Design For All (which focuses more on materiality).

In conclusion, there seems to be two types of justifications for "pedagogically" orienting towards the exploration of dimensions relating to EC, with a focus on the implicit mental system and the personal, emotional and relational, aspects for a reflection on the issue of the inclusion of SEN students:

First of all, an extensive and complex idea of inclusion - in line with the ICF, the Index and the CA models- calls into question the role of deep, embodied and unrecognized personal dimensions (implicit emotional-relational and personal psychobiological factors) as essential elements for achieving the subject's inclusion in society.

Secondly, research on neurosciences and EC provides insights for a better and appropriate scientific evidence-based understanding of the functioning of SEN students and the neuro-differences that characterize all human beings.

In the following paragraphs we will focus on this second direction.

## NEUROSCIENTIFIC CONTRIBUTION TO UNDERSTAND DEVELOPMENT, LEARNING AND DISABILITIES

One of the goals of cognitive neurosciences is the study of the most sophisticated aspects of our behavior, the naturalization process of cognition or social intelligence, consisting in understanding the nature of the neural processes that regulate interpersonal relationships, intersubjectivity (Gallese, 2014). The term "Affective Neuroscience" (Panksepp, 1998) outlines a new field of study and research of the neural mechanisms of emotion and their evolution. Specific neurocircuits underlying emotions ("emotional systems") are described, which regulate different aspects of our lives, thoughts and actions. According to this model, the alterations and inhibitions of the emotional systems give rise to the major psychosomatic diseases and psychological disorders. Therefore, the mechanisms activated by the understanding of the world and an adequate and adapted life (intelligence) involve different cognitive processes: sensory, visual, perceptual, motor, emotional and empathetic aspects (Trevarthen, 1997). Bodily and motor dimensions are involved in development and learning processes, and are interrelated to other cognitive and emotional dimensions (Damiani, Santaniello, Gomez, 2013). In brain development all cortical maps are connected, in a code that reproduces the (somatotopic) body structures, to deep sensorimotor systems, located below the cortex, mapped in the same way, which are able to guide and move the whole body (Lennie et al, 1990); vision is controlled and guided by many of the body parts. Hearing, sight and touch share a common field in which they operate interconnectedly.

In recent years, also because of the growing attention to SEN, cognitive sciences have investigated the central role of attention and Executive Functions (EF); a category which

includes groups that are different from each other in etiology and pathophysiology (Sonuga-Barke, 2005), of which there is not yet a clear and definitive definition. As Benso (2013) observes, even scientific literature cannot define the number and the types of the executive functions. Historically speaking, we mainly refer to the concepts of distractibility and perseveration developed after the studies carried out on frontal patients (Shallice, 1988).These concepts have been subsequently replaced with the terms control and flexibility (Baddeley, 1989; Shallice, 1988), inhibition, shifting and updating (Miyake et al., 2000); problem solving (Zelazo and Muller, 2002).McCloskey, Perkins and Van Diviner (2008) have subsequently identified about twenty executive functions only pertaining to self-regulation. In fact, they include a variety of cognitive processes (attention, memory, flexibility ...) that significantly condition the forms and ways in which intelligence is expressed, the behavioral responses and the possibility to learn in a more or less effective way (Benso, 2010).

The element of interest in our work is the emphasis on their relationship with the emotional aspects and the implied dimensions, which are presymbolic and unaware of the learning processes. In reference to the theory of modularization, some theoretical models identify types of module that are fully automated, and some others that, in order to function (as, for example, that of reading understood as reading and understanding skill), require a certain level of attention and motivation. Executive Functions take part in the different levels in various ways; it's not possible to isolate a single function; they are all interrelated and all involved, in various ways and to various degrees, in the development and learning tasks.

The idea of intelligence and intelligent behavior has been so deeply changed, and this leads to significant changes also in the acquired knowledge and beliefs about disability and the way to learn and be students at school. As already observed, the role of the context (including all people who live and work in it) is essential for understanding students' functioning, in terms of abilities or dis-abilities/capacities or dis-capacities. The concept of environmental intelligence (interdependence with the environment) helps us rethink the role of the teacher in his relationship with the development of students' intelligences. We are witnessing the redefinition of the descriptive and explanatory models of health and illnesses conditions and their instruments (PDM-APA, 2006; ICF, 2007; DSM 5, 2015), in relation to emerging complex and multidisciplinary paradigms, which agree on the simple consideration that understanding the symptom depends on the individual who presents it (Westen, Gabbard & Blagov, 2006), thus also on the environmental and personal context with which each person is related.

As highlighted by Karmiloff-Smith, Piaget's position is weak because it fails to explain some specific disabilities that leave other capabilities unchanged (such as LD), and does not aim at the understanding of the possible evolutions and possibilities for preventing disturbs. The comparison between impaired neurocognitive functions and spared cognitive functions suggests that the spared function result from other cognitive processes (Bishop 1997; Karmiloff-Smith et al.1997). Attention is paid to the dynamic interaction between the genetic component and environmental factors, in order to identify the most basic processing levels (potentially at the foundations of the different disturbs as a distal cause) and the possible effects of evolution on high-order processing. During modularization, the same process (i.e., verbalization, understanding ...) in the same children can take place at an early age for a microdomain, and at other ages for other microdomains. Learning must be seen as complex processes, both from a diachronic and synchronic standpoint, so they do not lend themselves to simplistic and monofactorial diagnostic and habilitation-rehabilitation approaches.

The neuroconstructivist approach considers environmental factors important for their effects on the cortical plasticity of the neurocognitive system. The study of such effects (of different rehabilitation methods) could provide important information about the causes of disorders, highlighting the causal relationship between trained function and disorder. According to this approach, comorbidity (coexistence of multiple disorders) between different developmental disorders would explain the complexity of the causal relationships between them, contrary to some biological approaches that consider disorders according to monofactorial models. These studies have, for example, helped highlight the monofactorial and probabilistic nature of neuropsychological dysfunctions underlying LD (Pennington 2006), and allow for a re-evaluation of the characteristics of disorder "specificities" (basically, they wouldn't be so specific like other acquired disorders) and new possibilities of prevention, at least when disorders become evident.

According to the multi-competence model by Moscovici and Umiltà, reading, writing and computation can be defined as modules with different degrees of modularity. First-type modules are those defined by Fodor (perception of colors, sound frequencies, sound and music localization, deep perception and human faces, ...) as unassembled modules, which are simpler and have their own specific function; second-type modules, which are innate too, are generated by assembled first-type modules (language, visual perception, motor action of walking), and they do not involve subject's intentionality too. Only third-type modules, which are more complex generated by the assemblage of second-type modules, need subject's awareness and willingness. They are assembled according to the subject's experience and intentions and constitute all the learning processes and complex behaviors of linguistic, perceptual and motor nature (reading a book, playing tennis ...). This model overcomes the dichotomist visions of reading (and, consequently, of reading disability) as the exclusive domain of visuoperception or language, takes into account the underlying necessary attentional resources, and considers also the non-verbal and preverbal dimensions.

From these frameworks, significant implications for educational and didactic activities emerge, which aim at developing skills and knowledge and are important for all students, but especially those with disorders and difficulties. Modules that are not well formed can represent alarm bells for school, as well as the awareness of the multicompetence nature of school skills must aim at acting didactically both on inferior-type levels (to recover the underperforming microdomain) and on parallel levels, working on processes that are not only of cognitive-attentional type. Lower-level type behavioral mastery is needed to consolidate higher and complex levels of competence, and the correlation of EF with emotional and corporeal aspects must be managed somehow, even in learning tasks. The classification of motor actions worked out by Rizzolatti and Sinigaglia (2006) codes the relationship among different cognitive processes: abilities like speaking or calculating require not only attention and other already mentioned EF, but also motor action.

Recent studies have shown that much of the reading difficulties of dyslexic subjects depends on the visual sensitivity and the auditory frequencies of the magnocellular system. The impairment of the magnocellular system impacts also the cerebellum, and then movements and balance. Some research seems to indicate that the degree of wobble is correlated with the degree of dyslexia (Stein, 2001), showing how our cognitive abilities are closely related to the movement abilities. So the first insights of Rod and Angela Fawcett are confirmed: the awareness of one's own body and of the movement enhances cognitive ability,

through the relationship between auditory-visual movement aspects and cognitive skills in general (reading skills in the specific case of dyslexia).

Studies on the possible applications and correlations between neurosciences and educational sciences have just begun to develop and, in some respects, they're ambiguous (Della Sala, 2016); however, an aspect recognized the scientific community concerns the possibility of early identification of developmental disorders. Screening children early is crucial to identifying those who might be at risk of developing learning difficulties. This may help to pave the way towards the provision of interventions designed to prevent/reduce deleterious long-term developmental trajectories caused by such difficulties. Recent evidence, particularly from the study of developmental difficulties in acquiring literacy skills (Developmental Dyslexia) have suggested that neuroimaging measures are not only responsive to intervention but can also be sensitive tools for the prognosis of long-term developmental outcomes (Hoeft et al.2007, 2011).This suggests that neuroimaging methods can represent a significant ‘added value’when it comes to screening children who might be at risk of developing long term learning difficulties. In the domain of mathematics, there's also an emerging body of research demonstrating the prognostic utility of neuroimaging for long-term individual differences in mathematical abilities as well as in responses to intervention (Supekar et al.2013; Evans et al.2013; Evans et al.2015) (Ansari e Lyons, 2016).

At the conclusion of this concise and not exhaustive overview, we highlight the centrality of relationship and integration processes as key dimensions of intelligence and overall mental functioning. As claimed by Siegel and Bryson (2012), brain's healthy functioning is a functioning of balanced and modulated relationship and integration between left and right hemisphere, and between “low-level type” and “high-level type” processes. Education and care must provide the possibility to live experiences of relationship, integration and flexibility of the subject's mind and body, between people and environment.

Brain functioning and intelligent human behavior, therefore, are made up of different multiple aspects which influence each other and are underestimated for their developmental and educational implications, which we can conceptualize as “the new missing dimensions.” So not considering them, considering only some of them or not considering their interrelations is a fundamental error of any educational-didactic or therapeutic-medical intervention aiming at promoting their development effectively.

The challenge is to think of some form of right for those dimensions to be included in school and training curricula, which does not result in a simple translation of health theories and practices in the educational field. It needs to identify constructs, dimensions, principles and practices – not related to healthcare - to help “enrich and enhance” didactic and educational planning, or better, to make them (a little) more suitable and effective for all (thus inclusive).

## THE FOCUS ON INCLUSION AS A RELATIONAL EXPERIENCE. EMERGING PERSPECTIVES: NEUROSCIENCES, PSYCHOANALYSIS AND EC

Going back to our object of investigation (improvement of inclusion processes at school through a didactics adapted to neuro-differences), in the context of the inclusion models to

which we have referred in the previous paragraphs, we have identified the relational dimension as the founding dimension, and we have identified some key principles/constructs, such as: capacity, well-being, choice, freedom, implicit, emotions, for which we have chosen to focus our attention on the personal and interpersonal dimensions. Their in-depth knowledge provides ways for recognizing them and enhances school more adequately.

In addition to the contribution of neurosciences, it seems interesting to refer also to the psychoanalytic model for its traditional theoretical and clinical exploration of many of the elements identified (although named and described according to different conceptualities), but even more for the fruitful dialogue it has been developing with Neurosciences.

This is a new field of interconnection between Psychoanalysis and Neurosciences that opens up to "transversal" concepts and paves the way for new studies, which could explain more deeply some of the personal dimensions underlying inclusion processes and, more generally, teaching-learning processes. In Italy, the idea of a possible integration between neurosciences and psychoanalysis is supported by scientists such as Mauro Mancia, physiologist and psychoanalyst, starting from the neuroscientific discovery of the existence of two memory systems: the declarative or explicit memory system and the implicit or non-declarative memory system (Squire, 1994; Schacter, 1996).The mnestic tracks in the implicit memory and in the unconscious, which cannot be removed, constitute the individual's brand, his main thrust, behavior and personality, and will continue to affect the emotional, cognitive, affective life for all his life.

More generally, the increasing comparison of psychoanalysis with neurosciences contributes to redefine the idea of mind and mental functioning.

Our contribution wants to make a small step forward in the definition of this relationship, by introducing the EC perspective as integrator and common background. Indeed, many of the topics, albeit only mentioned, seem to be consistent with the Embodied model and could be better explained and deepened thanks to it. In parallel, as already introduced by Gallese (Gallese, Migone, Eagle, 2007), psychoanalysis helps enrich the embodied approach, with a focusing on the issue of intersubjectivity in development, health, learning and participation processes. According to Gallese (2007), the discovery of mirror neurons and the resulting paradigm shift in neurocognitive research of intersubjectivity it has generated allow to consider, with cautious optimism, the naturalization project – at the level of sub-personal description - of intersubjectivity.

The intentional consonance generated by embodied simulation processes is consubstantial with the reciprocal relationship dynamic that always is subjective and objective pole of established between the interpersonal relationship. So intersubjectivity "ontologically" becomes the foundation of human condition, in which reciprocity defines existence constitutively. Of particular impact are the scientist's words reported below.

To put an end to this relationship I cannot find better words than those by Helmuth Plessner who in" The Levels of the Organic and Man - Conditio humana "(1928/2006, p.325) wrote: "Each realization of an ego, a person in a single body, is the premise of the sphere of you, of him, of us.[…] In order that a single man gets to the idea of not being alone and not being only a thing, but having other sentient beings like him as companions, he does not have as a basis a special act, that to project his way of life towards the outside, but he belongs to the assumptions of the human existence sphere" (Gallese, 2007, p.208).

As Semi affirms, a psychoanalyst who has undertaken an interesting debate with Giacomo Rizzolatti in Italy, for many years, the dominant model of mind functioning in the

scientific field is that of cognitive psychology; however, already the end of the nineties, the limits on some positions of cognitive psychology and on the description of mind as a computer had become clear. The significant increase of knowledge on brain functioning has led to a re-evaluation of the “alternative” models of mental life, like those of phenomenology and psychoanalysis. Several neuroscientists agree with such opportunity; according to Kandel (1999), psychoanalysis is still a consistent and intellectually satisfying model of our mind, while Rizzolatti highlights the strong disappointment of neurosciences with the model of brain as information processor. Among the various objections expressed by the neuroscientist, there is the one according to which computer needs precise concepts and psychological concepts are “false concepts” (Edelman), while the most common criticism, according to which computer doesn't feel emotions, would be less strong because it could also be overcome. Anyway, the most important aspect refers to Varela's view, revived by Rizzolatti, concerning the fact that computer lacks movement and an Ego. So the metaphor of the computer may be supported only in a mental model that does not consider a self and a motor dimension. In this sense, according to Rizzolatti, the model of psychoanalysis for the vision and enhancement of the concept of Ego and its bodily dimension is appropriate and in line with the current model of neurosciences, and research would receive a boost from the use of concepts and constructions which stem from different fields.

In fact, Freud's Ego is first and foremost a corporeal reality, linked to the body and movement (Freud, Ego and Id 1923), consistent with an idea of self that many cognitive neuroscientists tend to share today. In recent decades, the renewed interest in the interpersonal relationships and the conceptualization of the relationship between Self and external objects has taken various forms in the psychoanalytic field, both as a critique of Freud's concept of motivation and as expansion and reformulation of the traditional psychoanalytic concepts. Terms like “interpersonal psychoanalysis” or “relational,” ”two-persons psychology” or “ wo-body psychology,” ”intersubjectivity,” etc., have become popular, and traditional psychoanalysis has been often accused of being “positivistic,” “objectivistic” or too dependent on an overcome eighteenth-century model, implying that different authors have talked openly about the need for a “new paradigm.” However, there are no clear definitions of the different terminologies used to refer to this “new” paradigm, also because they refer to research areas that are not well defined, intertwined with each other and constantly changing (Gallese, Migone, Eagle, 2006, p.545).

There are two important aspects in our investigation: the Ego, as Semi has pointed out, is the key requirement of motor control and is understood as consistent and organized core of psychic processes; a significant part of such mental processes governed by the Ego is unconscious and is unlikely to ever gain a dimension of consciousness. Freud has highlighted how in certain psychic states (like a dream) there are knowledge processes following the specific rules of the primary processes typical of the unconscious system. These processes are not necessarily located in specific brain structures and the Ego uses both primary and secondary processes. It has the function of mediating between internal and external reality, and ensuring individual continuity (the narcissistic restoration) also during the change. The first function of the relationship with reality entails necessarily, although not exclusively, the use of secondary processes too, while the continuity of the ego implies the exclusive use of primary processes. The unconscious is considered as a function of the mind necessary to know also consciousness and to understand the individual's behaviors, feelings and emotions. These observations allow broadening the concept of unconscious, by playing down the aspect

linked to repression in favor of unrepressed experiences. It is a concept of unconscious (unrepressed unconscious) that is quite different from the one described by Freud in 1923, according to which a part of the Ego is unconscious as derives from the Id through the action on it of the perception–consciousness system: it is the result of the storage in the implicit memory of experiences, fantasies and defenses which belong to the presymbolic and preverbal stage of development and cannot therefore be remembered. Nevertheless, they can condition the affective, emotional, cognitive and sexual life even of the adult (Mancia, 2004, p.110).

Transfert, a key concept of psychoanalysis, is reworked by Mancia according to an original perspective that integrates different explanatory concepts and functioning aspects. Based on the relationship between implicit memory and unrepressed unconscious (2006), the author believes that the maternal voice is the first stimulus with which the child relates to the outside world. Maternal voice is a sort of imprinting because, by means of it, the child recognizes his mother's behavior and affective-emotional aspects. The child, already at a very early age, is sensitive to the tone musicality of his mother's voice, since this represents the root on which the first child's affective relationship with his mother is based. This dynamic will reappear in the transfert, and the unrepressed unconscious will be present in verbal and extraverbal components. Therefore, the non-verbal components of relationships will be characterized by behaviors (posture, facial expression, aspect, auditory and tactile sensory elements, etc.), while the verbal component must be grasped in the double semantics of language which allows to attach meaning to the modes of communication of the patient, not so much in the words themselves, but through the rhythm, tone, timbre, sentence musicality, syntax and timing of speech. Voice, in a complementary way, takes on a certain value as experience of one’s self and, at the same time, as expression of the self in the psychoanalytic relationship. The unrepressed unconscious in childhood needs a “reconstruction,” that is, an interpretation, a possibility of representation and “storage”; it cannot be remembered but re-experienced, relived, enacted in the interpersonal relationship.

Neuroscientific research outcomes help learn about structures or better understand how implicit and explicit memory is structured, providing a measure of how the unconscious is structured, pushing for the recomposition of body-mind separation (Damasio, 1995; Ramachandran, 1994). Neuroscientists overcome Freud's classification of instinctual life as a simple dichotomy between sexuality and aggression, and thanks to research on the brain they develop models of instinctual circuits as systems modulated by specific neurotransmitters: the “seeking” or “reward” system, which causes the pursuit of pleasure; the “anger-rage” system, which governs angry aggression but not predatory aggression; the “fear-anxiety” system and the “panic” system, which includes complex instincts (Panksepp 1998). In this dialogue space, although open and problematic in many aspects, we identify aspects of enrichment with and for the EC approach, with reference to the enhancement of non-verbal, bodily, motor, affective and implicit dimensions related to self-awareness in the relationship with others and with the world. The themes of subjectivity and intersubjectivity are dealt with by the relational perspective, which also involves first and foremost the body; the functional architecture of embodied simulation seems to constitute a basic feature of our brain, enabling our intersubjective experiences, being at the basis of our capacity to empathize with others (Gallese 2013).

According to Caruana and Borghi, (2013), EC has recovered some conceptual distinctions taken over from classical neuropsychology and phenomenology, allowing for a

(neuro)scientific study of the bodily experience. The most classical one is the contraposition between the concept of "body scheme" and that of "body image," or the more recent distinction between sense of agency and sense of ownership. These theoretical instruments have led to the development of a new concept of "corporeal self," a concept on the borderline between neurosciences and phenomenology, which has proved to be a fruitful interpretative key also for mental disorders like schizophrenia (Ferri et al., 2012).The scientific study of the phenomenology of the body has opened new psychological perspectives, filling some gaps implied in the classical amodal representational theory.

## FROM THE CORPOREAL EGO TO THE COGNITIVE UNCONSCIOUS: THE IMPLIED MENTAL SYSTEM

"Matte-Blanco (1975; 1988) reiterates the concept of unrepressed unconscious developed by Freud in "The Ego and the Id" and comments: a) not all the unconscious is repressed. Thus the Ego has unconscious repressed and unrepressed parts; b) consciousness and unconscious are qualities. This means that the unconscious cannot be regarded as the true psychic reality; c) the Id has both a repressed and an unrepressed part; d) some aspects of the Super-Ego belong to the unrepressed unconscious; e) the repressed unconscious and the unrepressed unconscious are essentially different in their origin, but not in their structure or in the rules governing them. Matte-Blanco's deepest insight concerns the two ways in which the Freudian unconscious operates: the asymmetric way, which characterizes classical or Aristotelian logics, and the symmetric way, which results from a symmetrization process that characterizes another logics. The consequence of this interweave of logics is the organization of a bi-logical structure, which is symmetric and asymmetric "(Mancia, 2006, p.14).

After Freud, the concept of repression loses strength and is replaced by the processes of splitting and projective identification, denial and idealization, in the new theory of unconscious mind worked out by Melania Klein and post-Kleinian authors. The discovery of the implicit memory in its affective and emotional dimension, and its link with the unrepressed unconscious, causes a further change in the psychoanalytic theory of the unconscious mind, and suggests new clinical modalities to bring to light unconscious material that is not subject to remembering. As shown by Mancia, this early unrepressed unconscious is discussed in relation to the biological unconscious described by Matte-Blanco.

Nowadays, we can see how the discovery by neurosciences affirming that there is only one long-term memory that can be retrieved and verbalized (explicit), and that memory is basically a memory which cannot be remembered nor verbalized (implicit), has had a significant impact on psychoanalysis (Oliverio, 2009), but it is still underestimated by educational and didactic research.

From an evolutionary perspective, implicit memory is the only memory that develops early; it is already present in the last weeks of gestation and is the only active memory in the first two years of life. It is characterized by procedural, emotional-affective and perceptual-bodily dimensions; these dimensions allow the newborn baby to store the first relational experiences with the world, and the first is that with his mother-environment. The relationship between mother-newborn baby is substantially bodily. This relationship, the way she touches him, she talks to him and looks at him, conveys feelings and emotions that will be stored in

his implicit emotional memory (Mancia, 2004; 2006). This type of unconscious contents are different from the Freudian unconscious contents as they are "primary," i.e., they do not imply any repression process in a dynamic sense, and constitute what it is called "cognitive unconscious." They are based on bodily and emotional-relational dimensions; non-verbal dialogue and non-verbal understanding are the only possible way to communicate with the two "unconsciouses."

Psychoanalytic therapy, based on the verbalization of repressed unconscious contents, is under review in the light of the discovery of the implicit system. Care and improvement processes can no longer be exclusively focused on the verbal relationship (Talking care) between patient and analyst; the improvement factor must be something consistent with the implicit cognitive dimension. So the therapeutic efficacy of the non-verbal cure and of the management of new patterns of relationship, communication and transformation, which cannot be translated into words, and based on the bodily, emotional, gestural, paraverbal, presymbolic and agency dimension, is affirmed. Therefore, the new psychoanalytic approaches are increasingly recognizing the value of inter-actions, actions or enacted intentions (enactment); neural networks are formed if interpersonal relationships have the right emotional (intimate and syntonic) tone, which neurosciences assess as biochemical tone. The implicit relationship\communication, from unconscious to unconscious, changes the brains of both partners in an evolutionary sense, if it occurs in the appropriate dialogue and emotional tone, forming new neural networks and new functional capabilities. Unfortunately, brains are modified dysfunctionally when relationships are not syntonic, but intrusive or dystonic. The role of implicit theories on students and learning by teachers is key, and highlights the need to train them appropriately (for more details see chap. 12). What happens in the teacher-student relationship that the teacher does not know? We all have an implicit theory, but the problem arises when we do not know what of our theory gets into the mind of our child or student. The implicit theory risks profoundly influencing the environment in anti-evolutionary anti-educational sense, making us remain attached to sterile and stereotyped views of both our abilities\possibilities to change it effectively (self-efficacy and self-agency), and of those of our students. The "good relationship" at school is not characterized as an end, but as a means to "displace the energy invested initially by teachers on cultural objects" (Damiano, 2010). A relationship where to trust each other and communicate openly. The essential elements for a good relationship: the mutual interaction process that must be, or at least appear, fair and equal (Schein, 2010). The ethical dimension of the relationships, essential to achieve inclusion, consists in developing a mindset in which it's possible to take care of other people and feel responsible for one's own actions and feelings, whether they're good or bad (Fasoli, 1994). We have already found out that these dimensions are considered to be central in the pedagogical theories of inclusion. Developments in the theory of the attachment have investigated its deep dynamics. The relationships with significant persons are generalized into operational models (of the Self, the Other and the Self-with-the Other) that attach meaning to the early interpersonal experiences, act as the basis for the assimilation and processing of subsequent experiences with the Other and are the matrix of future interactions.

Focusing back on learning processes, among the useful contributions for an application in education and didactics, in order to improve inclusion at school, we report these "deep cognitive processes" we have knowledge of by way of example but, not of limitation.

- *The implicit memory* - Memory is originally an implicit memory, not subject to conscious memory and not verbalized. Implicit memory is characterized by procedural,

emotional-affective and perceptual-bodily dimensions; these dimensions allow the newborn baby to store the first relational experiences with the world. *Explicit memory*, in contrast, can be retrieved consciously and verbalized, it concerns one's own autobiography and allows, through remembering, a reconstruction of one's personal history; it is an essential function so that the repression process can take place, and requires the integrity of the medial temporal lobe, the frontal–basal areas and the bilateral functionality of the hippocampus.

The dimensions of the implicit memory concerning psychoanalysis are the procedural and the emotional-affective ones, as they characterize the first child's relationship with his mother and participate in the organization of his Self (Stern, 1985). The physical contact with his mother, in fact, stimulates emotions and conveys feelings that will be the core elements of a relational learning stored in the implicit memory of the newborn baby.

Not only experiences and positive emotions, but also frustration and disillusionments will be stored in the preverbal and presymbolic implicit memory, and will form the structural elements of an unrepressed unconscious nucleus (Mancia, 2003; 2004). These experiences, in fact, may not be subject to the mechanism of repression, since the explicit memory structures, essential for the removal process, are not fully developed before the first 2-3 years of life (Siegel, 1999).

Educational and didactic research, given the increased attention to learning, behavioral and neurodevelopmental disabilities in general, is precisely analyzing the role of memories, including that procedural or implicit ones, and the enhancing or weakening role for the cognitive processes of the relationship with teachers (in their role as secondary caregivers), with reference to the model of brain plasticity (Lucangeli, 2012) and the neurocostructivist vision of intelligence and learning.

- *The implicit attentional system* - Most of the attentional processes (selection and processing of sensory and proprioceptive information) occurs implicitly, unconsciously. According to the premotor theory of attention (Rizzolatti et al., 1987), attention is "generated" by the same neural circuits involved in sensorimotor transformations; the selection and programming of a motor plan automatically moves attention towards the spatial regions, where the action must be performed. Affective and relational aspects like emotions, stress and motivation, greatly influence the attention capacity, and thus behaviors and cognitive performances. We have already shown that attentional skills are involved in all typical and atypical development learning processes.

- The *ability to choose* - although dealing with problematic issues that affect the ethics of neurosciences (Roskies, 2003), calling into question problematic topics like that of the free will, we cannot but consider, from an educational point of view, that many decision-making processes are realized unconsciously. Recent studies of "neuroeconomy," carried out through neuroimaging techniques, have shown implicit mechanisms also in the formulation of judgments; neurobiological-affective components (emotional and motivational arousal) are the biological spring that mediates perceptual and cognitive processes of facilitation or inhibition underlying the purchasing behavior (Balconi, 2009, in Balconi, Antonietti, eds.). Emotions, stress, bodily- relational aspects and past experiences largely condition our ability to judge and choose throughout our life.

- *Empathy* - defined as one of the most valuable resources of our world, empathy is an important issue concerning our life in the community (be it our family, school or society). The empathy in the interpersonal relationships and educational and work places is often taken for granted, and this has led to overlook it. The empathetic capacity is critical to the building

of inclusive relationships of care and attention to the other's differences. Neurosciences have theorized the lack of empathy as a result of a deficit in mirror neurons (Baron - Cohen, 2011); according to Gallese, Migoni and Eagle, “the integrity of the sensorimotor system really seems critical for the recognition of emotions showed by others (see Adolphs, 2003; Adolphs et al., 2000) because, in line with what proposed by Damasio (1994, 1996), the sensorimotor system allows for the reconstruction of what an individual would feel by simulating the his bodily state. The implication of this process for empathy is obvious “(p. 555). The psychoanalytical front helps describe the behaviors related to the development and expression of empathietic capacity. The baby's early interactions early interactions with caregivers, construct cognitive-affective schemas of self and other and that these schemas regulate and direct a wide range of subsequent behavior, especially in interpersonal relationships (Blatt, Auerbach, Levy, 1997). What is internalized is a pattern which sees the child in relation to others, in an important dynamic and implicit-procedural dimension. Theory and research have attached a role to the early relationships of care in the development of the representations of oneself and others, both in normal and pathological development. These initial Kleinians considerations are matched with the latest developments related to the construct of the attachment. From his birth, the child is part of an interactional system that unfolds over time, preserving an inherent continuity: this continuity is, on the one hand, the result of the dynamic interactive process between the individual and the environment and, on the other hand, an expression of the overall coherence of the individual's relational patterns and sense of self (Stern and Sander, 1980). Research on empathy mechanism also offers a model, albeit still open and under discussion in the scientific community, for interpreting some neurodevelopmental disorders like autism: “It is precisely the mirror mechanism, and in general the set of experiments to which it refers, which is responsible for some of the most interesting predispositions to developmental disorders like autism (Gallese, 2006; Gallese et al.,2007; 2012; Cattaneo et al., 2007; Boria et al., 2009; Fabbri-Destro et al., 2009; Cossu et al., 2012). “

In the field of an EC-based approach, it is finally highlighted the role of action and intersubjectivity. The recognition of the other and the ability to take care of the other, for his well-being, takes place at a very deep level through the movement, and the action of recognizing the other as capable, starting from the use of his kinesthesias, of building the world just like the subject himself does, means that it's possible to establish the relationship with the other not on generic empathy, but with the empathy with others' actions. The possibility of a rich intentional consonance with other individuals is made possible by sharing actions, emotions and feelings with other, as well as the neural mechanisms that underlie them; the shared interpersonal sense space: “space shared diversity” (Gallese) is an enlarged view of the concept of empathy.

Berthoz defines sympathy and empathy as substitutional behaviors of sharing of emotions, and proposes a spatial theory of empathy that identifies the main difference between the two modes of intersubjective relationship in the manipulation of the individual's viewpoint. Sympathy, according to Berthoz, means “attributing to ourselves what we observe in others. Such an attribution may involve simulating others within ourselves and identifying ourselves with him. But, in the process of sympathy, we don't move and we see the other from our viewpoint “(Berthoz, 2013, p. 33). So, in the relationship based on sympathy we remain in our place, while undergoing a process of emotional contagion. On the contrary, a fundamental characteristic of empathy, in this sense, it is the adoption of the point of view of

others and the simultaneous inhibition of emotional contagion. In the author's hypothesis, four processes at the basis of empathic intersubjective relationships are identified: The construction of a coherent perception of our body and its relationship to the environment; the ability to change our own perspective or viewpoint and mentally move our body and brain into the other's body and brain (Einfühlung); the ability to abandon the egocentric or hetero-centric perspective (our own and the other's) to adopt an allo-centric perspective, inhibiting the emotional contagion (Berthoz & Thirioux, 2010). These processes require the contribution, although not exclusive, of different brain mechanisms involved in spatial perception, in mental manipulation of the reference systems and in perspective changing. The problem of empathy cannot be reduced to spatial information management and recruitment position of others in the space. The central problem is being at the same time themselves and the other, living a sort of "out of body experience" which allows us to separate ourselves mentally from our own body and travel into the other's body with our "second self" or mental "double" (Berthoz & Petit, 2006).

In General, the emerging topics agree on reassessing the body, action and emotional dimension in cognitive and learning processes, justifying the openings towards a possible field of interconnection between psychoanalysis, neurosciences, EC and pedagogical and didactic research.

Within this new scenario, there are different spaces for in-depth analysis. Of particular urgency and interest is the exploration of the characteristics of the new (?) relational capacities in the internet era: what peculiarities, what risks and resources do virtual relationships, mediated by new technologies and social networks, involve? How do bodily competences change the virtual era? How does the educational and training relationship change in the era of e-learning and online learning communities? These are open questions which are to be taken into consideration, but we cannot discuss them in this work. We only mention an element of particular interest for our work, relating to research on internet addiction, in which it is observed that the essential dimensions for prevention are those personal ones: self-esteem, ability of self-control and self-regulation are inversely related to addiction (Widyantho and Griffiths, 2011). The hypothesis of the enhancement and compensatory function of lacks in the essential dimensions of development and personality (the functioning of the PF of the ICF), is reported in the literature about addictions both to internet and to substances (Kuss and Griffiths, 2011).

It is easy to observe that these are the same dimensions underlying "healthy," not specious nor manipulative relationship, thus they're vital for the development of social skills and empathetic and relational capacities, essential in students as future citizens, but still and most essential in the trainers of future citizens. A conditio sine qua non for achieving inclusive relationships.

## FROM SPECIAL EDUCATION TO SPECIALIZED EDUCATION FOR ALL: THE NEURODIDACTIC HYPOTHESIS

By focusing more on the possible contributions to the improvement of inclusive didactics, we can briefly affirm that an education consistent with the paradigm of

neurodiversity can only be a differentiated-type didactics, starting from the features of different students' functionings (and then going beyond ...).

As for SEN students, we adopt a little provocative thought by John Stein, who notices an evolutionary value of magnocellular dysfunctions causing dyslexia and other developmental disorders, as they're such common and frequent problems that cannot be considered somehow beneficial to humanity too. We consider this a very inclusive position that changes the view of the impairments, and we agree with the author by affirming that it is up to school and society to develop mechanisms enabling the understanding of these benefits. The need to differentiate didactics for neurodifferences justifies the use of the construct of "neurodidactics" (Herrmann, 2009; Sabitzer, 2010, 2011; Rivoltella, 2012; Damiani, 2012) founded on different consistent didactic methods. This approach has cleared away any false problem of justice/injustice in not giving/receiving the same educational stimulation and in not requiring the same performances for everyone.

The curriculum must be necessarily dynamic and the educational planning must be differentiated and neurodifferent, otherwise there will be no didactics for learning but something else (certifications, issuance of diplomas and marks, selection ...). School cannot guarantee training and development success for every student if it does not adopt an idea of inclusion that sees diversities as normalities.

Using the discoveries of neurosciences to improve teaching and learning processes is not a new idea; in fact, as noted by Borghi, developmental psychology is oriented to the development of sensorimotor dimensions starting from Piaget, but applications at school were and still are unrecognized by the pedagogy and didactics. The separation between school as a place for education in its "inside" and a place for learning in its "outside" is no longer useful; schools must be a place for learning and must teach how to learn; school is the place devoted to learning "how," but to do this, it is essential to know how to learn, what are learning processes and how they function, with reference to the paradigm of neurodiversity. Neurocognitive research demonstrates connections between intelligence and brain activity related to different cognitive tasks. Neuroimaging research shows that intelligence is associated with the reciprocity of several brain regions within a widespread brain network (Colom et al. 2008; Desco et al. 2011).

There are now many contributions in literature seeking to identify the principles of Neurodidactic research, starting from the Brain Based Learning approach (Caine & Caine, 1995), based on the idea of integration and necessary relationship among the elements as a general principle "neurofonded" on the model of brain functioning. As for didactics, it is about stimulating the creation of connections to teach "how" and not only "what." The Brain Based Learning (BBL) is a holistic and unitary approach stressing the principle that the brain is a parallelor processor, that is, it processes many functions and processes simultaneously; a principle consistent with the idea of inclusive didactics.

Based on these principles, some advice for effective and brain-based learning is given. They postulate that all students learn more effectively when: they are involved in experiences; their needs for social interaction and relationship are engaged and honored; their interests, purposes and ideas are engaged and honored; they can use their innate capacity of patterning; their learning is accompanied by positive emotions; details are embedded in wholes, that they understand, such as a real life event; their attention is deepened and multiple layers of the context are used to support learning; they have time to reflect on; immersed in experiences that engage multiple ways to remember; individual differences in maturation, development,

and prior learning are taken in consideration; the environment is supportive, empowering, and challenging; their individual talents, abilities, and capacities are engaged.[5]

The purpose and methodology of the BBL are centered on teachers' action, which stimulate the search for relationships and connections between topics, but especially between topics and personal meanings, through the collective confrontation for the search for relationships and connections. The mechanism is consistent with students' (and teachers') mental functioning, and aims to “exploit” the physiological tendency of the brain to create connections. Among the strategies used by the BBL, narration, the construction of stories and metaphors help create relationships between the elements in the field (cultural objects and persons).

Among the other contributions of scientific literature, there are Sabitzer’s directions resulting from research in the field of memory and cognition: the reduction of demands/requirements during the perception of new topics may increase the efficiency of learning and memory; An overview at the beginning of the lesson prepares the so-called priming, an implicit memory effect, that facilitates the recognition of a stimulus implicitly perceived before; Students shall also structure and organize their material on their own; The teacher should always refer to well-known topics; to integrate teamwork and projects as well as the multimedia. Moreover, there are many principles and proposals given by the knowledge about the functioning and process of the memory which highlight the importance of creating appropriate environment in our lessons (room, positive atmosphere, confidence, enthusiasm ...) to help the students motivate themselves and learn more effectively. It's possible to facilitate the learning process in all steps from perception of new information over the working and the long term memory by using various teaching methods, varied material etc. For the author, one of the main principles of neurodidactics is the following: Knowledge cannot be taught; it must be created newly in the brain of each student. This may surprise and contrast with the traditional view of school education (The teacher must teach something! = teacher centered instruction), but it is well substantiated in neuroscience and cognitive psychology. According to Maria Montessori's “Help me to do it alone!” the neurodidactics also proposes an active student role (= learner centered instruction). This leads to another way of education: self-regulated or self-organized learning which satisfies nearly all requirements of a pedagogy that has learned from brain research. The neurological basis of the statement above is the function of patterning: The brain recognizes and generates patterns and rules itself. The students don't need rules, but many examples, which help them, recognize the included structures. This brain-function is the basis for exploratory or discovery learning, which is one of the basic principles of progressive pedagogy. As our internal valuation-”software,” the limbic system, checks all new information and we only memorize what's good and meaningful for us, learning is especially effective, when it makes sense. Teachers should check the current knowledge and competences of their pupils and start the learning path from there because we are learning by making associations. All new information is linked to existing knowledge. But linking alone doesn't guarantee the storage of the information in the long-term memory. The more often we use the same association, the better we can memorize the learned issues. So the brain research proves another very old saying: Practice makes perfect!

[5] https://www.researchgate.net/publication/228411501 Sabitzer NEURODIDACTICS–A NEW STIMULUS IN ICT AND COMPUTER SCIENCE EDUCATION.

In conclusion, the neurodidactic perspective is consistent with the idea of learning for life, not for school.

## EC Contribution to Inclusive Didactics

In view of the various stimulations and possibilities of insights that have emerged so far, in closing our work, we will aim at redefining some aspects that are more related to the topic of inclusion of SEN students at school and of inclusive didactics, in an EC perspective. I am not going to get into the rich and complex debate on the epistemological perspectives and nature of EC, already well explored by different authors in the other chapters of the work, but I'll just focus on the relational and intersubjective key dimension of inclusion, according to the complex and multidimensional vision that involves different evolutionary and educational processes. For this exploration, I have used some ideas offered by the recent dialogue developed between neurosciences and psychoanalysis, in the light of a consistent (and integrator?) background of EC.

The EC approach based on intersubjectivity, according to Gallese, and the current model of psychoanalysis, which tends to intersubjectivity, represent a fertile meeting space and justify the focus on the intersubjective dimension for the building of the individual's mind, emotional-relational and inclusive competences. According to these perspectives, the sociocultural dimensions, although not explored directly, are present as embodied cultural dimensions, that is, they're mediated by the body of subjects in the world. EC contribution to inclusion can be identified mainly in the identification of the dimension of an “enriched” relationship, according to which it would be appropriate to protect the various dimensions that make it up.

Indeed, the discovery of mirror neurons has introduced the adoption of a new model of mind and mental functioning, consistent with “alternative models to those of computers (psychoanalytic and phenomenological), through the enhancement of the missing dimensions: the body and the emotions, or more precisely, the embodied theories on emotions (Caruana and Gallese, 2011; 2012 and Caruana, 2011). However, as observed by Caruana and Borghi (2013), it is undoubtedly the social field, the intersubjectivity and the understanding of other individuals, in which new cognitive science has forced the science of mind to move forward to a higher quality level. “Empathy, emotions, language, art, psychopathology, rehabilitation, are only some of the themes that have dealt with this discovery; recent studies have shown that the activation of mirror neurons is modulated by contextual variables such as the familiarity with the observed action (Rochat et al., 2010), the position in which it is performed, the (egocentric, side, front) perspective from which the action is observed, the value attached to the observed object (Caggiano et al, 2009; 2011; 2012).”

As pointed out by Allen and BekoV (1997), an “all-or nothing” approach to social cognitions is strongly arguable. As Gallese affirms, (2008) it is reasonable to hypothesize that this evolutionary process proceeded along a line of continuity (Gallese et al., 2002; Gallese and Umiltà, 2006). It is perhaps more fruitful to establish to which extent different cognitive strategies may be underpinned by similar functional mechanisms, which in the course of evolution acquire increasing complexity. The data on mirror neurons in monkeys and mirroring circuits in the human brain seem to suggest that the ease with which we are capable

to understand others and recognize them as similar to us - in other words, our "Intentional Attunement" to others - may rely on a series of mirroring mechanisms that we have just started.

We believe that the elements characterizing the EC approach and those emerging from the identification of the interdisciplinary connections on the issues of corporeality, affectivity, intersubjectivity and well-being, can be adopted to improve the didactic approaches based on the principles of inclusiveness and innovation; innovation and inclusion necessarily go hand in hand and share an embodied nature. According to Alter (1999), innovation is an action that is simultaneously complementary and opposed to the universe of organization, because it requires the ability to shake up and give up what has ensured success in the past. In this sense, we believe that an idea of an "EC-Based" inclusive didactics is an "enhanced, integrated and updated" inclusive-innovative didactics (Gomez Paloma, Damiani, 2015), able to revolutionize and re-organize itself in the face of differences and the unexpected. Such an approach enables the realization of what pedagogical literature and the policy on integration/inclusion have discussed in recent years, that is, the extension of the need to adopt "special measures," from disabled students to all SEN students and, ultimately, to all students, since they all have specific and different characteristics: from special didactics to specialized didactics for all (Ianes, 2014).

A didactics which is more respectful of all the dimensions making up inclusion and teaching-learning processes must provide moments of narration and building of stories - according to the ways of thinking and building knowledge - the use of metaphors to connect meanings, motivations and pre-verbal and implicit dimensions, and the consideration of the body (in the images of art and thought, through dance, music, drama, motor education), for the sub-symbolic, unconscious and sensorimotor aspects (Deahne, 2014) of the emotional and attentional aspects, and implicit assessment aspects which are at the foundations of the theories and beliefs about people and objects (Damasio, 1996; Nussbaum, 2004). In the previous paragraphs we have highlighted how a learning and didactic model cannot be limited to explicit and rational cognitive constructs, but it needs also to retrieve first-level type (implied) mental representations and embodied processes and contents.

Theoretically, the principles and strategies consistent with a "neurodidactic and EC-based" approach seem to be functional to two previously identified paths for achieving a change of school from an inclusive perspective: 1) for the improvement of didactics according to the principles of neurodiversity 2) for the arrangement and promotion of personal freedom and abilities to learn and participate.

## CONCLUSION

Adopting the ECS perspective opens up interesting search areas, also for special education. The identification of the connections between emotional perception, implicit memory and motor system; between the empathetic capacities and the perceptual-motor aspects; between unconscious attention and neurodevelopmental disorders like LSD and ADHD, offers options for further reflection for understanding students' functional profiles and defining new strategies for educational intervention.

In conclusion, it needs to reiterate the attitude of caution we consider necessary to be adopted in relation to the advancement of fascinating theoretical speculations and "neuroscience-based" perspectives of educational and didactic research, which may be more or less innovative and justified. However, it needs to point out an indisputable element of advantage resulting from the adoption of an embodied approach to didactics, or even just its knowledge and consideration by teachers. Basically, this approach helps raise questions; it encourages teachers' reflexive capacities, improves the ability to observe what are the processes involved in disciplinary learning, according to the individual differences of their students but, above all, it helps rethink the subject they teach not as an abstract object, a default product in itself to be provided (albeit through small and wise annual school programming doses), and forces to consider the relationship between the subjects of the teaching-learning processes and the object of disciplinary knowledge.

According to the constructivist paradigm, the representation of reality in the ECS model is not its objective reproduction, but rather the result of a dynamic relationship with the individual who is the beneficiary of this relationship. Thanks to the neural mechanism of the embodied simulation, resulting from the dual executive/observational function of the mirror neurons, in most of the cases, the interpretation of others ' behavior is immediate, automatic, pre-reflexive and pre-conceptual. This may explain the unconscious side- but very powerful for its effects on the possibilities of learning and on the effective changes of people - of the relationship with the subject and the experiences of knowledge of the other and the world, which all originate as a bodily and affective-relational experience, and represent initially unaware "emotion-thought," as described by Nussbaum. The teaching-learning process takes place exclusively through the educational-training relationship with the "relational caregiver" teacher (Blandino e Granieri, 2002; Damiani, 2011). The contents passing through this relationship are very different from the "neutral" and inert contents described in textbooks or observed in the worksheets or in the network. Through the physical relationship with teachers and peers, the cultural contents are embodied in and with real individuals' minds and adopt changing, varied and different configurations, because people's bodies and minds are different and unique too, but always significant and "impregnated."

The embodied didactics of disciplines can only be and individualized and personalized didactics, which restores the individualization and personalization processes in their broadest, more inclusive and authentic meanings and, at the same time, it redefines, differentiates and enhances the "education for all."

## REFERENCES

Allen, C., & BekoV, M. (1997). Species of mind. Cambridge, MA: MIT Press.

Adolphs R. (2003). Cognitive neuroscience of human social behavior. *Nat Rev Neurosci.* 2003;4:165–78.[PubMed].

Adolphs R., Damasio H., Tranel D. et al. (2000). A role for somatosensory cortices in the visual recognition of emotion as revealed in three-dimensional lesion mapping. J. *Neuros.* 20: 2683-2690.

Ansari D., Kamirloff Smith A. (2002). Atypical trajectories of number development: a neuroconstructivist perspective. http://www.ncbi.nlm.nih. gov/pubmed/12475711.

Alter N. (1999). Organisation et innovation: une rencontre désordonnée, URL: http://tinyurl.com/59tn4k.

Ansari, D. & Lyons, I.M. (2016). Cognitive neuroscience and mathematics learning: how far have we come? Where do we need to go?, *ZDM Mathematics Education* (2016) 48: 379.

Argyris, C. and Schön, D. (1978). Organizational Learning: A Theory of Action Perspective. Reading, MA: Addison-Wesley.

Armstrong T. (2007). Neurodiverity in the classroom. Strength-Based Strategies to Help Students with Special Needs Succeed in School and Life, ASCD, Alexandria, USA.

Baddeley, A.D. (1986). Working memory. Oxford: Oxford University Press.

Balconi M., Antonietti A. (a cura di), (2009). Scegliere, comprare: Dinamiche di acquisto in psicologia e neuroscienze, New York: Springer.

Baron-Cohen S. (2011). Zero Degrees of Empathy: A New Theory of Human cruelty. London: Penguin/Allen Lane.

Bateson G. (1972). Steps to an Ecology of Mind, San Francisco: Chandler Publishing Co.

Bateson G. (1979). Mind and Nature: A Necessary Unit, New York: Dutton.

Benso F. (2010). Sistema attentivo-esecutivo e lettura. Un approccio neuropsicologico alla dislessia. Il Leone Verde.

Benso F. (2013). Sistema Attentivo Esecutivo: osservazioni critiche e sviluppo. In Sabbadini L. Disturbi Specifici del Linguaggio, Disprassie e Funzioni Esecutive. Springer Verlag Italia pp 43 – 86.

Berthoz, A. (2013). Vicariance (La): Le cerveau créateur de mondes. Paris: Odile Jacob.

Berthoz, A., & Petit, J.L. (2006). Physiologie de l'action et Phénoménologie. Paris: Odile Jacob.

Berthoz, A., & Thirioux, B. (2010). A Spatial and Perspective Change Theory of the Difference Between Sympathy and Empathy. *Paragrana*, 19(1), 32–61.

Biggeri M., Santi M. (2012). The missing dimensions of children's well-being and well-becoming in education systems: Capabilities and Philosophy for Children. *Journal of Human Development and Capabilities*, 13(3), 373-395.

Bion, W.R. (1961). Experiences in groups. London: Tavistock Publications.

Bion, W.R. (1962). Learning from experience. London: Heinemann.

Bishop D.V.M. (1997b). Uncommon Understunding: Development and Disorders of Language Comprehension in Children, Hove: Psychology Press.

Blandino G. (1996), Le capacità relazionali. Prospettive psicodinamiche, Torino: Utet Università.

Blandino G. (2010), Psicologia come funzione della mente, Torino: Utet Università.

Blandino G., Granieri B. (2002), Le risorse emotive nella scuola, Milano: Raffaello Cortina.

Blatt, S. j., Auerbach, j. S., & Levy, K. N. (1997). Mental representations in personory, ality development, psychopathology, and the therapeutic process. *Review of ho General Psychology*, 1,351-374. doi:1O.1037/l089-2680.1A.351.

Booth T., Ainscow M. (2014). Il nuovo Index per l'inclusione. Roma: Carocci.

Booth T., Ainscow M., Black-Hawkins K., Vaughn M., Shaw L. (2000). Index for inclusion: Developing learning and participation in schools. Bristol, UK: CSIE.

Caggiano, V., Fogassi, L., Rizzolatti, G., Thier, P. & Casile, A. (2009). Mirror neurons differentially encode the peripersonal and extrapersonal space of monkeys. *Science*, 324, 403–406.

Caggiano, V., Fogassi, L., Rizzolatti, G., Pomper, J.K., Thier, P., Giese, M.A. & Casile, A. (2011) View-based encoding of actions in mirror neurons of area f5 in macaque premotor cortex. *Curr. Biol.*, 21, 144–148.

Caggiano, V., Fogassi, L., Rizzolatti, G., Casile, A., Giese, M.A. & Thier, P. (2012) Mirror neurons encode the subjective value of an observed action. Proc. Natl. Acad. Sci. USA, 109, 11848–11853. Caine G., Caine M. (1995), Reinventing schools troughth brain – based learning, in *"Educational Leadership,"* 52(7), pp. 43-47.

Caine G. e Caine M. (1995), Reinventing schools troughth brain – based learning, in *"Educational Leadership,"* 52(7), pp. 43-47.

Caldin R. (2009). La prospettiva nella/della scuola. Percorsi di ricerca e nuove questioni. Studium Educationis, 3, 2009, 85-99 (numero monografico La scuola all'inizio del terzo millennio, curato da L. Galliani e L. Santelli Beccegato).

Caldin R. (2010). Da 0 a 6. Nella complessità dell'attuale situazione scolastica, quale via per l'inclusione? Convegno Anffas Onlus Nazionale Roma, 6 febbraio 2010.

Caldin R. (2015), La promozione dell'inclusione e l'impegno "cooperativo," L'integrazione scolastica e sociale Vol. 14, n. 3, settembre 2015, Trento: Erickson.

Caldin R. (http://www.siped.it/wp-content/uploads/2015/08/Caldin.pdf).

Canevaro, Dal sostegno ai sostegni, dal contesto ai contesti, in "Rivista dell'istruzione," n. 2, marzo-aprile 2011.

Canevaro A. (2008). Pietre che affiorano. I mediatori efficaci in educazione. Trento: Erickson.

Canevaro A. (2011). Apprendere nelle classi difficili. In https://www.sperimentarea.tv/ondemand/andrea-canevaro-apprendere-nelle-classi-difficili.

Canevaro A. (2016). L'ospite inatteso abiterà il progetto? Entrando in una storia…Atti del Convegno Internazionale "UNIversal Inclusion Rights and opportunities for Persons with Disabilities in the Academic Context," Aula Magna Università di Torino, Cavallerizza Reale, 12-13-14 Maggio.

Canevaro A., Malaguti E. (2014). Inclusione ed educazione: sfide contemporanee nel dibattito intorno alla pedagogia speciale, vol. 2 n. 2, Italian Journal of Special Education for Inclusion. Lecce: Pensa Multimedia.

Caruana F. (2011). Esiste una Agnosia Enterocettiva? L'insula e l'interruzione della dipendenza, Giornale Italiano di Psicologia, n°3/2011.

Caruana F., Borghi A. M. (2013), Embodied Cognition: una nuova psicologia, Giornale Italiano di Psicologia, DOI: 10.1421/73973.

Caruana F., Gallese V. (2011). Sentire, esprimere, comprendere le emozioni. Una nuova prospettiva neuroscientifica, Sistemi Intelligenti, n°2/2011.

Caruana F., Gallese V. (2012). Overcoming the emotion experience/expression dichotomy, *Behavioral and Brain Sciences.*

Cattaneo L., Fabbri-Destro M., Boria S., Pieraccini C., Cossu G., Monti, Rizzolatti G. (2007). Impairment of actions chains in autism and its possible role in intention understanding. Proceedings of the National Academy of Sciences of United States of America, 104: 17825-17830.

Cerini G. (2009). La valutazione tra autonomia delle scuole e standard nazionali, in http://www.edscuola.it/archivio/riformeonline/valutazione. htm.

Cohen, W. M. and D. A. Levinthal (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly* 35(1): 128-152.

Collins A., HAlverson R. (2010). The second educational revolution: rethinking education in the age of technology, *Journal of Computer Assisted Learning,* Volume 26, Issue 1. February 2010, Pages 18–27.

Cornoldi C. (1999). Le difficoltà di apprendimento a scuola. Roma: Carocci.

Colom, R., Abad, F. J., Quiroga, M. A., Shih, P. C., & Flores-Mendoza C. (2008). Working memory and intelligence are highly related constructs, but why? *Intelligence*, 36, 584−606.

Damasio AR. (1994). Descartes' Error: Emotion, Reason, and the Human Brain. New York: Grosset/Putnam; 1994.

Damasio AR. (1996). The somatic marker hypothesis and the possible functions of the prefrontal cortex. *Philos Trans R Soc Lond B Biol Sci.* 1996;351:1413–20. [PubMed].

Damiani P. (2014). Tra innovazione e inclusione: il bisogno di formazione alle "nuove competenze inclusive" dei docenti. Basi teoriche per un modello formativo coerente, *European Journal of Research on Education and Teaching,* Anno XIII, Numero 2, 2015, pp. 297-302, Lecce: Pensa Multimedia.

Damiani P. (2012). Neuroscienze e Disturbi Specifici dell'Apprendimento: verso una "Neurodidattica"?, in *"Integrazione Scolastica e Sociale,"* 11/4, Trento: Erickson.

Damiani P. (2011). Le dimensioni implicite e affettive nelle relazioni a scuola e il successo scolastico, articolo in "Formazione & Insegnamento," Culture Formative: Una questione di sviluppo o di trasformazione? Volume n. 2/2011 n. 2/2011, Lecce: Pensa Multimedia.

Damiani P., Santaniello A., Gomez Paloma F. (2015). Ripensare la Didattica alla luce delle Neuroscienze. Corpo, abilità visuospaziali ed empatia: una ricerca esplorativa, Giornale Italiano della Ricerca Educativa – Italian *Journal of Educational Research,* anno VIII | numero 14 | Giugno 2015, pp. 84-105, Lecce: Pensa Multimedia.

Damiano E. (2010). La competenza etica degli insegnanti. In C. Xodo, M. Benetton, Che cos'è la competenza? Lecce: Pensa Multimedia.

Dehaene S. (2014). Consciousness and the Brain: Deciphering How the Brain Codes Our Thoughts. Viking Press.

Della Sala S. (2016). Le neuroscienze a scuola. Il buono, il brutto, il cattivo, Firenze: Giunti Editore.

Desco M1, Navas-Sanchez FJ, Sanchez-González J, Reig S, Robles O, Franco C, Guzmán-De-Villoria JA, García-Barreno P, Arango C. (2011). Mathematically gifted adolescents use more extensive and more bilateral areas of the fronto-parietal network than controls during executive functioning and fluid reasoning tasks, *Neuroimage.* Apr 1. Elsevier Inc.

Dyson, A. (1999). Inclusion and inclusions: theories and discourses in inclusive education, in: H. Daniels & P. Garner (Eds) World yearbook of education 1999: Inclusive Education (London, Kogan Page).

Dovigo F. (2016), La scuola come organizzazione inclusiva: un lungo percorso, Introduzione in *"None Excluded Inclusive Education Conference Proceeding,"* Aprile 2016.

Edelman G. M. (1987). Neural Darwinism: The Theory of Neuronal Group Selection. New York, NY: Basic Books, Inc. [PubMed].

Evans T. M., Kochalka J., Ngoon T. J., Wu S. S., Qin S., Battista C., et al. (2015). Brain structural integrity and intrinsic functional connectivity forecast 6 year longitudinal growth in children's numerical abilities. *J. Neurosci.* 35 11743–11750. 10.1523/JNEUROSCI.0216-15.2015.

Fasoli D. (1994). Etica e psicoanalisi. Roma: Borla.

Ferri F, Frassinetti F, Mastrangelo F, Salone A, Ferro FM, Gallese V. (2012). Bodily self and schizophrenia: the loss of implicit self-body knowledge. *Conscious Cogn;* 21(3):1365-74.

Fredricks J., Blumend F.C., Paris A. (2004). School Engagement: Potential of the Concept, State of the Evidence, *Review of Educational Research Spring* 2004, Vol. 74, No. 1, pp. 59-109.

Fodor, J. (1983). The Modularity of Mind. *MIT Press.*

Fodor, J. (1992). A theory of the child's theory of mind. *Cognition*, 44.

Fornasa W., Medeghini R. (2012). L'educazione inclusiva. culture e pratiche nei contesti educativi e scolastici: una prospettiva psicopedagogica, Milano: Franco Angeli.

Gallese, V. (2005b). Embodied simulation: From neurons to phenomenal experience. *Phenomenology and the Cognitive Sciences*, 4, 23–48. *Psychological Research* 123.

Gallese V. (2006), Corpo vivo, simulazione incarnate e intersoggettività, in Neurofenomenologia. Le scienze della mente e le sfide dell'esperienza cosciente, a cura di Cappuccio M., Milano: Mondadori.

Gallese, V. (2006). Intentional attunement: A neurophysiological perspective on social cognition and its disruption in autism. *Experimental Brain Research. Cognitive Brain Research*, 1079, 15–24.

Gallese, V. (2007). Before and below theory of mind: Embodied simulation and the neural correlates of social cognition. *Philosophical Transactions Royal Society of London B*, 362, 659–669.

Gallese V. (2007). Dai neuroni specchio alla consonanza intenzionale Meccanismi neurofisiologici dell'intersoggettività, *Rivista di Psicoanalisi*, 2007, LIII, 1, 197-208.

Gallese, V. (2008). Empathy, embodied simulation and the brain. *Journal of the American Psychoanalytic Association*, 56, 769–781.

Gallese V. (2013). Corpo non mente. Le neuroscienze cognitive e la genesi di soggettività ed intersoggettività. In: *Educazione Sentimentale*, 20: 8-24, 2013. 1.

Galllese V. (2014). Arte, Corpo, Cervello: Per un'Estetica Sperimentale. Micromega, 2/2014, 49-67.

Gallese V. and Umiltà, M.A. (2006). Cognitive Continuity in Primate Social Cognition. In *Biological Theory* 1: 25-30.

Gallese, V., Fadiga, Fogassi, L., L., and Rizzolatti, G. (2002) Action representation and the inferior parietal lobule. In Prinz, W., and Hommel, B. (Eds.) Common Mechanisms in Perception and Action: Attention and Performance, Vol. XIX. Oxford: Oxford University Press, pp. 247-266.

Gallese, V., Keysers, C., & Rizzolatti, G. (2004). A unifying view of the basis of social cognition. *Trends in Cognitive Sciences*, 8, 396–403.

Gallese, V., Eagle, M. E., & Migone, P. (2007). Intentional attunement: Mirror neurons and the neural underpinnings of interpersonal relations. *Journal of the American Psychoanalytic Association*, 55, 131–176.

Gallese, V., Rochat, M.J., and Berchio, C. (2012). The mirror mechanism and its potential role in the Autism Spectrum Disorder. *Dev Med Child Neurol.* 2012 Aug 28. doi: 10.1111/j.1469-8749.2012.04398.x. [Epub ahead of print].

Ghedin E. (2009). Ben-essere disabili. Un approccio positivo all'inclusione. Napoli: Liguori.

Von Krogh G., Ichijo K., Nonaka I. (2000). Enabling Knowledge Creation,

Ghedin E. (2009). Ben-essere disabili. Un approccio positivo all'inclusione. Napoli: Liguor.

Gomez Paloma F., Damiani P. (2015). Cognizione corporea, competenze integrate e formazione dei docenti. I tre volti dell'Embodied Cognitive Science per una scuola inclusive: Trento: Erickson.

Hermann U. (2009). Neurodidaktik. Grundlagen und Vorschläge für gehirngerechtes Lehren und Lernen, Weinheim/Basel: Beltz 2009.

Hinshelwood, R.D. (1987). What happens in groups. London: Free Association Books.

Hyslop-Margison E.J. (2005). Liberalizing vocational study: Democratic learning in career education. University Press of America, Lanham, MD.

Hyslop-Margison E.J, Sears A. (2010), Enhancing Teacher Performance: The Role of Professional Autonomy, Interchange (2010) 41: 1. doi:10.1007/s10780-010-9106-3.

Hodkinson, A. J. (2005). Conceptions and misconceptions of inclusive education: a critical examination of final-year teacher trainees' knowledge and understanding of inclusion, *Research in Education* 73, 15–28.

Hoeft F, McCandliss BD, Black JM, Gantman A, Zakerani N, Hulme C, et al. (2011). Neural systems predicting long-term outcome in dyslexia. *Proc Natl Acad Sci U S A.* 2011;108(1):361–366.

Hoeft F, Meyler A, Hernandez A, Juel C, Taylor-Hill H, Martindale JL, et al. (2007). Functional and morphometric brain dissociation between dyslexia and reading ability. *Proc Natl Acad Sci U S A.* 2007;104(10):4234–4239.

Ianes D. (2006). La speciale normalità. Trento: Erickson.

Ianes D. (2014). L'evoluzione dell'insegnante di sostegno. Trento: Erickson.

Jaques, E. (1955). Social systems as defense against persecutory and depressive anxiety. In M. Klein, P. Heimann, R. Money-Kyrle (eds.), New directions in psychoanalysis, London: Tavistock Publications.

Kandel E.R. (1999). "Biology and the Future of Psychoanalysis: A New Intellectual Framework for Psychiatry Revisited," in *American Journal of Psychiatry*, vol. 156, no. 4, 1999, pp. 505-524.

Kagan J. (2013). The Human Spark. The Science of Human Development. Trad. it. Lo sviluppo umano. Tra genetica ed esperienza, Milano: *Raffaello Cortina*, 2014.

Karmiloff-Smith, A. (1992). Beyond modularity: A developmental approach to cognitive science. Cambridge, MA: MIT Press.

Karmiloff-Smith A. (1996). Beyond Modularity: A Developmental Perspective on Cognitive Science. Cambridge, MA: MIT Press.

Karmiloff-Smith A. (2007). Williams syndrome. *Curr Biol*. 17 (24): R1035–R1036.

Karmiloff-Smith, A., Grant, J., Berthoud, I., Davies, M., Howlin, P. and Udwin, O. (1997). Language and Williams syndrome: how intact is "intact"? *Child Development*, 68, 246-62.

Kuss, D.J. & Griffiths, M.D. (2011). Excessive online social networking: Can adolescents become addicted to Facebook? *Education and Health*, 29. 63-66.

Le Doux J. (2015). Anxiosus. Using the Brain to Understand and Treat Fear and Anxiety, trad. It. (2015), Come il cervello ci aiuta a capirla, Milano: Raffaello Cortina.

Legrenzi P., Umiltà C. (2009). Neuro-mania. Il cervello non spiega chi siamo. Bologna: il Mulino.

Lennie et al. (1990). Parallel processing of visual information. In L. Spillman, J.S. Werner (Eds.), *Visual Perception: The Neurophysiological Foundations.* San Diego: Academic Press.

Lucangeli D. (2013). Proceedings from Convegno AIRIPA, 24 Aprile 2013, Padova: Facoltà di Psicologia.

Mancia, M. (2003a). Dream actors in the theatre of memory: their role in the psychoanalytic process. *Int. J. Psychoanal.*, 84: 945-952.

Mancia M. (2004). Sentire le parole. Archivi sonori della memoria implicita e musicalità del transfer, *Bollati Boringhieri.*

Mancia, M. (2006a). Psicoanalisi e Neuroscienze. *Springer-Verlag.*

Mancia, M. (2006b). Implicit memory and early unrepressed unconscious: Their role in the therapeutic prosess (How the neurosciences can contribute to psychoanalysis*). International Journal of Psychoanalysis*, 87(1), 83-104.

Matte Blanco I. (1975). The Unconscious as Infinite Sets, Gerald Duckworth & Company Ltd, London, tr. it., L'inconscio come insiemi infiniti (2000), Einaudi, Torino.

Matte Blanco I. (1988). Thinking, Feeling, and Being, Routledge, London-NewYork, tr. it., Pensare, sentire, essere (1995), Einaudi, Torino.

McCloskey, G., Perkins, L. A., & Van Diviner, B. (2008). Assessment and intervention for executive function difficulties. New York: Routledge.

Miyake, A., Friedman, N.P., Emerson, M.J., Witzki, A.H., Howerter, A., Wager, T. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive Psychology*, 41, 49–100.

Miyake, A., Friedman, N.P., Rettinger, D.A., Shah, P., & Hegarty, M. (2001). How are visuospatial working memory, executive functioning, and spatial abilities related? A latent variable analysis. *Journal of Experimental Psychology: General*, 130, 621–640.

Miyake A., McCloskey, G., Perkins, L. A., & Van Diviner, B. (2008). Assessment and intervention for executive function difficulties. New York: Routledge.

Miller F., Kats J. (2002). The Inclusion Breakthrought: Unleashing the Real Power of Diversity, San Francisco CA: Berrett Koheler.

Moreira P.A. (2016). Student Involvement with School, "2young2fail - Final Conference," Turin, 6th July 2016.

Moreira P.A., Bilimória H., Pedrosa C., Pires M., Cepa M., Mestre M., Ferreira M., Serra N. (2013). Engagement with School in Students with Special Educational Needs, *International Journal of Psychology and Psychological Therapy*, 2015, 15, 3, 361-375.

Nonaka I., Takeuchi H., (1995). The Knowledge Creating Compan, Oxford: Oxford University Press.

Nussbaum M. C. (2001), Upheavals of Thought – The intelligence of emotions, Cambridge University Press.

Oliver, C. (1991). Strategic responses to institutional processes. Academy of Management Review, 16, 145–179.

Oliverio A. (2009), La vita nascosta del cervello, Firenze: Giunti.

Panksepp J. (1998). Affective Neuroscience: The Foundations of Human and Animal Emotions. New York: Oxford University Press.

Pennington B. F. (2006). From single to multiple deficit models of developmental disorders. Cognition101 385–413 10.1016/j.cognition. 2006.04.008 [PubMed] [Cross Ref].

Perini, M. (2007). L'Organizzazione Nascosta: Dinamiche inconsce e zone d'ombra nelle moderne organizzazioni. Franco Angeli, Milano.

Polanyi M. (1966). The Tacit Dimension, NY: Anchor Books.

Ramachandran V.S. (1994). Phantom limbs, neglect syndromes, repressed memories, and Freudian psychology, Inter. Riv. Neurob., PubMed.

Rivoltella P.C. (2012). Neurodidattica. Insegnare al cervello che apprende. Milano: Raffaello Cortina.

Rivoltella, P.C. (2014). La previsione. Neuroscienze, didattica, apprendimento. Brescia: La Scuola.

Rivoltella, P.C. (2016). Che cos'è un EAS. L'idea, il metodo, la didattica. Brescia: La Scuola.

Rix J. (2015). Must Inclusion be Special? Rethinking Educational Support Within a Community of Provision. Current Debates in Educational Psychology London: Routledge.

Rizzolatti, G., Riggio, L., Dascola, I. and Umiltá C. (1987). Reorienting attention across the horizontal and vertical meridians: evidence in favor of a premotor theory of attention. *Neuropsychologia* 25: 31-40.

Rizzolatti,G., & Sinigaglia,C., (2006). So quel che fai. Il cervello che agisce e i neuroni a specchio, Milano: Raffaello Cortina Editore.

Rochat, P., & Zahavi, D. (2010). The uncanny mirror: A re-framing of mirror self-experience. *Cognition and Consciousness, Elsevier Inc.*

Roskies A. (2002). Neuroethics for the new millennium, *Neuron*, 35, pp. 21-23.

Ruggerini C. (2009). Itinerari di sviluppo dei bambini dislessici: molteplicità dei fattori di protezione alla luce della Medicina Basata sulle Narrazioni, Convegno "La Dislessia tra i banchi di scuola e non solo," Modena, 21 aprile, http://csa.provincia.modena.it/.

Sabitzer, B. (2010). Neurodidaktik - Neue Impulse für den Informatikunterricht. In G. Brandhofer, G. Futschek, P. Micheu, A. Reiter, & K. Schoder, 25 Jahre Schulinformatik in Österreich. Zukunft mit Herkunft. Tagungsband (pp. 305-320). Wien: Österreichische Computer Gesellschaft ÖCG.

Sabitzer, B. (2011). Neurodidactis - A New Stimulus in ICT and Computer Science Education. *INTED Proceedings*. Valencia: Iated.

Santi M. (2014). Evaluating the commitment toward inclusion: a multidimensional Repertoire, Pensa MultiMedia Editore srl ISSN 2038-9736 (in press) / ISSN 2038-9744 (on line) Giornale Italiano della Ricerca Educativa anno V - numero speciale - ottobre 2012 pp. 99-111.

Santi M. (2015). Se l'inclusione sfida il sostegno: note a margine di un percorso formative, Lecce. Pensa Mulutimendia, Italian Journal of Special Education for Inclusion anno II |.

Santi M., Ghedin E. (2011). Index of Commitment Towards Flourishing Inclusion, paper presented at "Children's Capabilities Conference." Cambridge: *School of Education*, April 11-13.

Sapucci, G. (2007). Dall'insegnante di sostegno al sostegno diffuso. L'integrazione scolastica e sociale, 6(5), 434-437. Trento: Erickson.

Schacter, D.L. (1996). Searching for memory: The brain, the mind, and the past. New York: Basic Books.

Schein E. H. (2010). Organizational Culture and Leadership, 4 edition. Jossey-Bass, ISBN-10: 0470190604, ISBN-13: 978-0470190609.

Scerif G, Karmiloff-Smith A. (2005). The dawn of cognitive genetics? Crucial developmental caveats. *Trends Cognitive Sci* 2005; 9: 126-135.

Sears A. (2010). Doing Educational Research. In The Routledge Education Studies Textbook, London and New York: Routledge.

Sen A. K. (1999a). Commodities and Capabilities. New Delhi, India: Oxford University Press.

Sen A. K. (1999b). Development as Freedom. New York: *Knopf.*

Sen A. K. (2002). The right to One's Identity. *Frontline,* 19, 1.

Shallice, T. (1988). From neuropsychology to mental structure. Cambridge, UK: Cambridge Univ. Press.

Shallice, T. (1994). Multiple levels of control processes. In C. Umilta & M. Moscovitch (Eds.), Attention and performance XV (pp. 395–420). Cambridge, MA: MIT Press.

Siegel D. (1999). La mente relazionale. Milano: Raffaello Cortina.

Siegel D., Bryson Payne T. (2012). The Whole-Brain Child. 12 Revolutionary Strategies to Nurture Your Child's Developing Mind, Survive Everyday Parenting Struggles, and Help Your Family Thrive, New York: Paperback**.**

Singer J. (1998). Using SAS PROC MIXED to Fit Multilevel Models, Hierarchical Models, and Individual Growth Models, *Journal of Educational and Behavioral Statistics,* Vol. 23, No. 4. (Winter, 1998), pp. 323-355.

Sonuga-Barke EJ (2005). Causal models of attentiondeficit/ hyperactivity disorder: from common simple deficits to multiple developmental pathways. *Biol Psychiatry* 2005;57:1231–1238.

Squire, L. R. (1994). Declarative and nondeclarative memory: Multiple brain systems support learning and memory. In D. Schacter & E. Tulving (Eds.), Memory systems 1994. Cambridge, MA: MIT Press.

Stein J. (2001). The magnocellular theory of developmental dyslexia, *Dyslexia,* Volume 7, Issue 1, Pages 12–36.

Stern D. (1985). The Interpersonal World of the Infant (1985), New York: Basic Books.

Supekar A., L. Uddin, Khouzam A., Jr Phillips J.,William D. Gaillard W.D:,Lauren E. Kenworthy L., Benjamin E. Yerys B., Chandan J. Vaidya C., Vinod Menon V. (2013). Brain hyper-connectivity in children with autism and its links to social deficits, PUBmED, http://www.ncbi.nlm.nih. gov/pmc/articles/PMC3894787/.

Thompson E. (2005). Sensorimotor subjectivity and the enactive approach to experience. *Phenomenology and the Cognitive Sciences*. 4, pp. 407-427.

Trevarthen C. (1997). Empatia e biologia. Milano: Raffaello Cortina.

Tschannen-Moran, M. (2004). Trust matters. San Francisco: Josey-Bass.

Von Krogh, G., Ishijo, K., & Nonaka, I. (2000). Enabling knowledge creation: How to unlock the mystery of tacit knowledge and release the power of innovation. New York: Oxford University Press.

Weick, K. E. (2001). Making sense of the organization, Oxford, UK: Blackwell, ISBN 0631223177.

Weick, K. E., Sutcliffe, K. and Obstfeld, D. (2005). Organizing and the process of sensemaking, Browning & Boudès 39 Organizational Science, ISSN 1047-7039, 16(4): 409-421.

Westen, D., Gabbard, G., & Blagov, P**.** (2006). Â Back to the future: Personality structure as a context for psychopathology. In R. F. Krueger & J. L. Tackett (Eds.), Personality and psychopathology: Building bridges (pp. 335-384). New York, NY: Guilford Press.

Widyanto, L., and Griffiths, M. D. (2006). "Internet addiction": a critical review. *Int. J. Ment. Health Addict*. 4, 31–51.

Winnicott D., (1970). Sviluppo affettivo e ambiente, Roma: Armando Ed.

WHO (2001). International Classification of Functioning. Geneva: WHO.

WHO (2007). International Classification of Functioning – Children and Youth., Geneva: WHO.

Zelazo, P.D. e Müller, U. (2002). Executive function in typical and atypical development. In U. Goswami (a cura di), *Handbook of childhood cognitive developmen*t. Oxford, UK: Blackwell.

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