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ABSTRACT

The present paper is a theoretical discussion of the representation of embedded body within a virtual digital-technology-based learning context like Metawelt. For the sake of educational effectiveness and success, the teaching/learning process proposed here must be defined by the UDL paradigm and devised after continuous and continual research in the specificities of the pupil in a dynamic, inclusive and multi-sensory environment.

Il presente articolo propone una riflessione teorica sulla rappresentazione del corpo embedded all'interno di un contesto di apprendimento virtuale, quale il Metawelt, sviluppato attraverso l'utilizzo del digitale. L'agire didattico, così come proposto nel contributo, affinché sia realmente efficace e formativo deve essere definito attraverso una progettazione universale basata sul paradigma dello UDL e realizzato tramite una ricerca continua delle specificità dell'alunno in un environment inclusivo, dinamico e multisensoriale.

KEYWORDS

Inclusion, body, metawelt, didactics, technologies
Inclusione, corpo, metawelt, didattica, tecnologie

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Introduction¹

Inclusive schooling as “everybody and anybody's school” has been one fundamental aspect of education research in the past few years. This specific sense was derived from UDL's educational paradigm, which also envisages the possible introduction of digital aids.

This schooling pattern implies that education be tailored to each and every individual's specific features, including the Special Needs macro-category and is basically corroborated by a deeper and deeper reflection on the meaning and scope of corporeality and body awareness in an inclusivity-based teaching/learning process.

Far from giving body-awareness-based experiences and contributions all the room they deserved, educational practice has often provided a limited view of the human body and its deficits; recent neuroscience studies now evince that cognitive processes are necessarily related to corporeality, thus calling upon us to reconsider the relations between body and mind.

New theory supporting this renewed view of corporeality and body awareness can now interrelate with a stable inclusion-oriented theoretical framework. This interaction has now allowed for the building and spreading all over the education milieu (Canevaro, 2013) of a culture that promotes a view and representation of the human body as an integral part of the subject and its educational route, not only as an object to be observed in its disfunctions and impairments.

The rediscovery of the human body within the self-awareness and -recognition process urges us to assert that corporeality-oriented and -inclusive teaching should be reconsidered also in schools and education centres. Corporeality and body awareness should be proposed in its various and diverse forms and manners in order to guarantee the participation and involvement of each and every individual as the protagonist of their own growth and development.

A form of teaching centred on the combination of corporeality and learning can be seen in the development of new multimedia and info-tech products – virtual reality can reproduce feelings and emotions by simulating real experience, thus letting pupils experiment with new things and make up for their difficulties by

¹ Even though the present paper is the result of a group's work, Rosa Sgambelluri is the scientific coordinator of it and the author of the second paragraph; Maria Grazia De Domenico wrote the introduction and the first paragraph; Massimiliano Lo Iacono wrote the third paragraph. Rosa Sgambelluri and Massimiliano Lo Iacono have contributed to drawing up the conclusions and proofreading the whole and editing it to its final version.

delving into their own resources in divergent ways. This holds good for special needs people as well (Aiello, 2016).

Whether corporeality can be educational even if it could be affected by any possible confusion between the virtual and the real is surely a value-added issue, inasmuch as it would a) shed some more light into the features of a person with special needs and b) stress the importance of the continuity relation between body and mind, which has now become an unquestionable truth (Spadafora & Fabiano, 2022).

1. A New Representation of Corporeality: from the physical body to the embedded body

The social, cultural and economic framework of the present age makes us face the need to reconsider our senso-motor dimension, which has drifted from a representation of the human body as “matter” to a form of corporeality that enables a person to think, reason and act and unavoidably presides over the development of their own self and identity.

Moving on to education and pedagogy, which rarely considered the experiential value of human body for long, we can now maintain that corporeality can not and should not be excluded from the educational routes and itineraries, which is in line with the idea of the human being as a bio-psycho-social unit. (WHO, 2001)

There are numerous positions which a) evince cognitive processes related to the human body and its interactions with the environment, b) define corporeality's role in mental processes in greater and greater detail and so c) argue that the relationship between the human body and the environment is not contrastive but mutually-inclusive. (Merleau-Ponty, 1945).

In the late 20th century, Gardner (1983) already stressed our need to get over the separation between mind activities and body activities, as the mind-body gap was often linked to the idea that what we do with our bodies is “of a lower rank”, less noble, than what we do with our minds when trying to solve problems by means of language, logic and some other relatively abstract symbolic system (Gardner, 1983, p. 228).

The rise of cognitive science in the 1950s and the fast growth of neuroscience in the past 20 years raised new issues even in the social science debate.

Even education and cognitive sciences greatly contributed to a revaluation of corporeality in the past few years, namely through the study of brain, mind and body connections (Contini, Fabbri & Manuzzi, 2006). The function that the neuro-

scientific approach now ascribes to the human body (which has become a generally-accepted cognitive instrument) has determined a research shift from the study of the human mind as it is to a study of the human mind as interdependent with the human body and the environment, with particular reference to the role of the body in the growth and development of human knowledge and identity (Cappuccio, 2006; Gallagher, 2005): within this paradigmatic change, the human body necessarily interacts with the environment and with the other than self and the subjects come into contact with each other just through their bodies, which are the roots of the world.

In this respect, research showed that one could learn even through their body and stressed that body processes condition mind processes (Gallese, 2007). So, corporeality needs revisiting and possibly reconsidering, and we must abandon our linear view of the human body (which has long been regarded as a biological entity with organic function only) and ascribe to it several qualities that amplify its sense and meaning, thus placing it at the foundation of self-expression and existential fulfilment.

Hence the need to drift toward an embodiment paradigm (Varela et al., 1991; Lakoff & Johnson, 1999; Shapiro, 2010), i.e. a theory whereby the human mind is embodied, because it can communicate with the outer world through the body.

This paradigm underlies a representation of the human body not only as *Körper* (mere physical organ), but also as *Leib* (Husserl, 1931) (corporeality which takes its shape by being rooted in the reality it experiences). (Cambi, 2010)

So, human experience cannot lie outside the body-mind interaction, inasmuch as there is no learning that takes place outside the human body: this view paves the way for a scenario where corporeality today seems to configure itself also as a “pedagogical imperative”. (Isidori, 2002, p. 11)

Moving from the new embodied theory paradigm whereby body factors are inseparable parts of mental and cognitive processes, we can then regard the body as an additional resource for carrying out our tasks, so that the individual does not have to rely on their mind as their only learning instrument (Gomez Paloma, Raiola & Tafuri, 2015). These new perspectives in neuroscience and the neurobiological mechanisms of our minds are certainly redefining educational principles as well. New theory supporting this recent view of corporeality can actually intertwine with the theoretical framework underlying inclusive education. Recent cues from neuro-scientific research whereby cognitive processes depend upon corporeality and body-awareness have promoted a new view of the human body as a fundamental factor in teaching and learning.

The aforesaid premises suggest that if a learner's cognitive processes are in a sense embodied in and influenced by their body structures as well as by the world

around them, then also teaching and learning should regard their body's significant role in each and every cognitive process and educational interaction, which are procedures necessarily residing in corporeality. (Bellantonio, 2015)

2. Corporeality and Body-awareness in the Digital Era: promoting inclusive processes

Acknowledging and recognizing the educational value of the human body is the result of a long-term process which entails overcoming the Cartesian *logos-pathos* duality. (Damasio, 1995)

Merleau-Ponty (2012), Le Boulch (1975), Shapiro (2010) and other major scholars have contributed to ascertaining the prominent role of corporeality and body-awareness as a fundamental element in building significant learning.

Also research in Embodied Cognition Science (Varela et al., 1991; Lakoff & Johnson, 1999; Gomez Paloma & Damiani, 2015; Shapiro & Stolz, 2019) has contributed to ascertaining the potential resources inherent in corporeal experience by arguing that numerous cognitive processes cannot be carried out without the mediation of the human body. Hence the relevant role of corporeality as an indispensable and irreplaceable element in teaching and learning.

Therefore, we cannot fail to analyze the human body in its most significant features and aspects, which are the core of inclusive holistic person-centered teaching and learning practices.

In the past few decades, pedagogical debate on corporeality has primarily focused upon the possible connections between this holistic perspective and inclusive processes. In spite of the strong evidence of their factual existence, the scientific question on these connections stays open. Corporeality actually requires deeper investigation, mainly as to its very significance in digital inclusive teaching and learning. (Spadafora & Fabiano, 2022, p.310)

Present Italian and international research (Calvani et al., 2019; Fabiano, 2020; Murdaca et al., 2012; Medina- García et al., 2021; Wilkens et al., 2021) considers digital education an indispensable element in devising inclusive-education-focused activities. In these respects, new technologies become facilitators, educational strategies, curricular and soft-skill competences through which students can determine themselves (Cottini, 2016; Deci & Ryan, 2000; Wehmeyer et al., 1996; 2003).

In studying educational technologies and digital education, however, one cannot disregard corporeality and motricity as crucial factors in the inclusion of students in educational processes through a motor experience which is inevitably kinesthetic, sensory and emotional. Thus, it is technology which enables us to enact space-time and real-virtual interactive relations.

In fact, the Universal Design (UDL) approach (CAST 2018; 2011) seems to be the most adequate model for seriously reconsidering the role of education in order to re-value the uniqueness of all skills and abilities intrinsic to each and every human being by means of viable, effective and sustainable teaching and learning methods (Calvani, 2019) and technological strategies capable of respecting and valuing diversity.

In setting great store by the multiplicity of learning styles, UDL develops and enhances corporeality-oriented experiences through which students become aware of their qualities and drawbacks. As a result, UDL enables students to activate meta-cognitive strategies and acquire practical, transversal and flexible skills.

Thus, by promoting cognitive and meta-cognitive processes, technologies based on the UDL inclusivity paradigm provide interesting examples of how digital skills can improve each and every pupil's learning experience. A form of teaching that meets the growing diversity of needs cropping up in the various classes definitely annuls any kind of difference.

Considering the human body a vehicle of liberty, freedom, equality and identity as envisaged by a universal design, we may conclude that any teaching action valorizing human-body inclusivity can encourage each and every student to develop global skills through a holistic approach that is systemic, universal and multi-disciplinary.

3. Metawelt as the Digital Expression of Corporeality in Inclusive Education.

A theory whereby learning solely depends on the use of technology would surely be partial and incomplete; in fact, identifying technology with the development of digital teaching methods becomes a process that could be carried out only after having distinguished instrument and action, facilitator and inclination.

What makes the former tangible and pragmatic and the latter changing and innovative is the separation between body and mind – in the former, technology supports and sustains; in the latter, technology turns into digital, computational, divergent and creative thinking. Technology creates tools, digital knowledge develops ideas, thoughts and actions.

Both tread the path toward inclusion, an infinite research process toward the fulfilment of the human being, toward the development of a live empathetic and active emotional state. (Lo Iacono, 2020)

Thus, we are referring to a construction whereby body and mind project themselves into a synesthetic relation, into a dialectic proprioception and

interdependence process, into a body-kinesthetic-intelligence world. (Gardner, 1987). What we take the aforesaid construction to mean in the present paper goes well beyond the strictly kinetic idea of corporeality, so as to involve the mind in a comfortable dimension of its own, within a comfort zone where attitudes and relations associate with aptitudes and inclinations which are innate or built in the plasticity of unforeseeable events, single, sole and irrepeatable. The difference between uniqueness and specificity, however, lies in the evidence that the former is given *per se*, each and every individual is unique (De Vita & Rosa, 2017; Montesano et al., 2019), whereas the latter projects us from an effective and inclusive educational action (Ianes & Canevaro, 2023) into the idea of building educational and formative routes by interacting with the specificities that have been expressed, evinced or placed within a proximal development zone (Vygotskij, 1987). Specificity is what the human being has which actually or potentially is, but which is governed or ruled by structures known in the individual's mind and body, possible and actually feasible; unicity is the product of all specificities put together. The ability to identify, understand and educe (extract) the student's specificities enables the teacher to hook up previously-acquired ideas, learning styles, aptitudes, inclinations and skills and substantiate them, highlight them and make them manifest through the various learning stages. The whole process engenders dynamics whereby the student consciously and actively builds their own training, determines themselves and clearly perceives themselves as self-effective (Bandura, 2016). Therefore, specificity here is to be regarded as a micro-potential agent of the individual which develops and manifests itself in their intentional and motivational aptitudes.

In inclusive education activity, the designing of the teaching route structure must be based upon each and every individual specificity. It is specificities that teaching/learning processes should be built, modelled, ideated and rephrased upon.

In the perspective described above, inclusivity is bound to be projected into the individual's specificities, into those specificities which are typical of digitally native minds (Ferri, 2011), into that possible metawelt (Sibilio et al., 2023) which develops virtual perceptions, which stimulates mind and body in a possible dichotomic real-virtual context. However, the virtual dimension must be perceived somehow, inasmuch as it cannot be experienced without going through a real feeling, through a cognitive process related to the senses, perceptions, proprioceptions and self-perception. (Spadafora & Fabiano, 2022)

A digital education that is related to the innovative routes, methods and strategies the Italian school system is asked to develop should design new teaching styles by means of innovative technologies and new class settings. The

Italian Recovery and Resilience Plan (PNRR) urgently pushes toward new educational contexts, new technologies and unprecedented changes that would renew and improve training and learning. New teaching and learning scenarios will inevitably envisage new contexts, such as immersive classes, multi-function STEM (Science, Technology, Engineering and Mathematics) labs, virtual visors, augmented reality, holograms and metaverse. Moreover, the development and introduction of artificial intelligence in teaching will project students' learning styles toward a heuristic trend, an active self-motivated research attitude.

So, metawelt is a context which seems to be out of the real world where one's own identity can determine itself outside by developing learning routes through an external representation which is objective of the corporeal self and creating representational avatars which act thanks to a perception of the self that is intra- and extra-corporeal at the same time. Moreover, ambivalence can be seen in the individual's ability to move from real to virtual perceptions and viceversa, thus pre-designing quick adaptation exchanges through their senses. Therefore, the student can perceive the virtual dimension through their senses, the real ones in an external personification of the self that is governed by their mental and cognitive structures and by creative contexts and environments which can be adapted to various educational needs. Metawelt's infinite potential and multiform constructions make teaching flexible and adaptable to all learning styles, i.e. to all possible specificities of the learner.

A parallel universe created artificially through a digital representation, metaverse is built and can be modified, if need be, i.e. it can be adapted, adjusted and tailored to the individual in question. Performant contexts designed for specific learning dynamics can be created in this way. The innovative advantage of this context relative to a real context is that it can be bent, cut and pasted to the learner's inclinations and needs.

Conclusions

Metawelt (Di Tore, 2022) can be considered a new learning frontier within inclusive education. One can create a hybrid phenomenology of the body, a representation of the self in another self it governs and rules. Thus, the virtual learning context provides a simulated spacetime, a structure that can be governed and ruled from the outside. Simulating virtual environments built from the outside enables the individual to perceive themselves by objectivizing their own learning processes, making their way through experience and knowledge by means of meta-cognitive structures within an autonomous spacetime.

The double significance of the body “in me” and “outside of me” allows for the exploration of the self even through external perception, thanks to the objectivization of one's corporeal ego.

Thus, the human body keeps its fundamental learning value unchanged and becomes the *medium* within the teaching/learning process. Its educational dimension actually rests in its ability to appear in its body-mind ambivalence, in its tight indivisible bidimensional relation. Neuro-sciences scientifically support this view, which is clearly exemplified by the discovery of the mirror neurons (Rizzolatti, Sinigaglia, 2006) applied to psycho-motricity. Moreover, the body allows for the creation of one's own identity by starting from the perception of the other through meta-cognitive structures and processes. Therefore, in its constant body-mind interaction, the embodied cognition (Gallese & Cuccio, 2016; Gomez Paloma, 2013) tells us that, whether in a real or virtual context, it can even produce cognitive processes and it can even become embodied education.

Finally, in building an educational context, we should necessarily refer to the UDL inclusive model (Savia, 2016; Sgambelluri, 2020) as a fundamental paradigm for creating a definitely universal, flexible and effective learning environment which does not neglect the specificities and needs of all students concerned.

Together with the construction of a virtual learning environment like metavelt and the use of new digital educational methodologies, the universal design creates a fruitful and effective environment for educating pupils and orienting their active participation in the teaching/learning process.

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