FROM OBSERVATION TO EDUCATIONAL DESIGN: THE VIDEO MODELING IN THE TRAINING OF PHYSICAL EDUCATION TEACHERS

DALL'OSSERVAZIONE ALLA PROGETTAZIONE EDUCATIVA: IL VIDEO MODELING NELLA FORMAZIONE DEGLI INSEGNANTI DI EDUCAZIONE FISICA

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ABSTRACT
Studies describe learning as a holistic process that simultaneously activates processes of perception/action, emotion, and cognition, in a constant interaction with the environment. The design of motor activities must recognize the intentionality of the individual and the importance of the environment in determining the outcomes of the development of functional and transferable skills for all children. The goal of this contribution is to highlight the potential of video modeling in the training of physical education teachers, to promote the understanding of the sense of spontaneous motor initiatives of the child, for more effective design of inclusive learning experiences.

Gli studi descrivono l'apprendimento come un processo olistico che attiva simultaneamente processi di percezione/azione, emozione e cognizione, in interazione con l'ambiente. La progettazione delle attività motorie a scuola deve riconoscere l'intenzionalità dell'individuo e l'importanza dell'ambiente nel determinare gli esiti dello sviluppo di competenze funzionali e trasferibili per tutti i bambini. L'obiettivo di questo contributo è di evidenziare le potenzialità del video modeling nella formazione degli insegnanti di educazione fisica, per favorire la comprensione del senso delle iniziative motorie spontanee del bambino, per una più efficace progettazione di esperienze di apprendimento inclusivo.

KEYWORDS
Physical education, teaching and learning, video modeling, educational design, inclusion
Educazione fisica, insegnamento e apprendimento, video modeling, progettazione educativa, inclusione

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Introduction

The school of the 21st century is called upon to respond to a persistent succession of educational emergencies, that is the result of new socio-cultural frameworks, as well as numerous regulatory developments that are helping to redefine the role of the scholastic educational context in promoting educational, training and inclusive processes. In the last twenty years, the complex socio-cultural scenario, that was outlined on education and, in particular, on inclusion, requires a necessary reconsideration of the teaching strategies and techniques that are most effective in fostering the implementation of virtuous educational-didactic interventions. In this scenario, the reflections that emerged in recent decades, related to the school context also and above all considering the new inclusive paradigm, determined by the introduction of the *International Classification of Functioning* (WHO, 2001; 2007), require a repositioning of motor activities as a tool for promoting inclusive educational-didactic processes, also in the light of a renewed dialogue between pedagogy and neuroscience. Over the years, motor education was subjected to a strong paradigmatic change within the socio-cultural and educational reality that determined different implementation strategies, depending on the new awareness reached on the learning, specifically motor learning. According to the national and international scientific literature, motor sport activities constitute a valuable tool for the individual to actively participate within meaningful motor experiences (Whitehead, 2013). However, this goal is only seemingly simple, if the multidimensionality is considered as subtended to the functioning of the individual, who behaves as a *complex dynamic system* (Thelen & Smith, 1994), constantly co-evolving and determining within a physical and social context that responds to *non-linear* (Sibilio, 2020) logics. The emerging consciousness in the psycho-pedagogical and neuroscientific fields on learning, describes latter as a holistic process, which takes on characteristics of complexity, dynamism and non-linearity. The existence of a dialogue between processes of perception/action, cognition and emotion (Caruana & Borghi, 2016) and, in an ecological perspective, of the co-evolutionary nature of these processes, in constant and dynamic interaction with the environment, require a reconsideration of the design of educational and didactic interventions, especially in the motor field in which, an integral participation of the individual in activities is realized, simultaneously involving all dimensions of being. The complexity entailed by learning processes and the interdependence between the individual and the environment represents an integrating background that unites studies on cognitive processes and the knowledge that emerged regarding motor learning, which highlight an inescapable interdependence between *individual*, *environmental* and *task constraints* (Newell, 1986; Davids et al., 2008).

In the light of the bio-psycho-social paradigm, disability represents a complex phenomenon that requires the consideration of multiple aspects: health conditions, implications at the level of body structures and functions, limitations in the performance of activities and consequent restrictions to social participation, taking into account environmental and personal factors (Buono & Zagaria, 2003). In this scientific and cultural scenario, during the planning of motor activities in primary school, it is necessary to give value and meaning to the child's spontaneous initiatives, as an expression of personal (WHO, 2001; 2007) or individual (Newell, 1986) factors, as well as *contextual* (WHO, 2001;2007) or *environmental* (Gibson, 1979) variables, which significantly influence the possibilities of activity and participation, motor investment, development of functional movements and motor skills. It is essential, therefore, to recognize the unavoidability of the psychosomatic unity of the individual in the context of learning processes and interdependence with others and the environment. By setting motor-sports activities in the school context in an ecological, systemic and non-linear perspective, and in continuity with the bio-psycho-social paradigm, this contribution aims to reflect on the potential of using video modelling in the training of physical education teachers in order to foster in future teachers the acquisition of skills in the observation of pupils' motor initiatives, within an unstructured and "open" motor-sport context in which, starting from the observation of the child's spontaneous motor investment, it is possible to grasp the elements of intentionality as a unique and inalienable expression of his or her personal movement skills and "functioning" possibilities and as a basic principle for the pursuit of self-determination. This is in order to promote, in the field of physical education at school, starting with a more conscious and responsible ability on the part of the teacher to organize and manipulate constraints, the planning and implementation of educational-motor interventions that are more effective and inclusive.

1. The inclusive potential of physical education at school

The scientific literature and legislation, both national and international, highlights the importance of physical education and motor-sport activities in promoting the integral development of the person (Bailey, 2006; Sport England, 2017); in fostering health and bio-psycho-social well-being (WHO, 2016), significantly affecting physical fitness, health, cognitive functioning, psychological well-being and social inclusion (Bangsbo et al., 2016); as well as in fostering for the subject the pursuit of the principles of self-determination (Ryan & Deci, 2007; Cottini, 2016) and quality of life (Schalock & Verdugo Alonso, 2002; Giaconi, 2015). More generally, concerning the "play", a clinical report produced by the American Academy of

Paediatrics (AAP) (Ginsburg, 2007) describes its power to transform children's lives by helping them tackle stress, as well as positively affecting learning abilities, so much so as to identify play as one of psychological, mental, physical, intellectual and social enrichment (Yogman et al., 2018).

According to the scientific literature, national and international regulations describe physical education in didactic field, and motor-sport activities more generally, as tools capable of promoting the total development of the personality, as well as the acquisition of personal, cognitive and interpersonal skills, that are transferable from the field of motor activities to the different contexts of life. Life skills represent, in fact, that set of personal, relational and social skills that enable each individual to deal with the needs of everyday life, relating with confidence to himself, to others and to the community.

In the Italian educational context, the National Indications and the new scenarios (MIUR, 2012, 2018) identify Physical Education as a tool for promoting cognitive, social, cultural and affective experiences, defining it as a «*hinge discipline* between the scientific (knowledge of one's own body, how it works, physics of movement, correct lifestyles, etc.), communicative and expressive, relational and citizenship spheres» (MIUR, 2018, p. 14). The educational and training potential inherent in motor activities, practiced within the school educational context, are undeniable. They represent an extremely valuable moment in which the active participation of the child is continuously promoted within meaningful (Whitehead, 2013) changing and therefore always challenging motor (as well as cognitive, emotional and social) experiences, which foster the development of adaptive functions, functional movements and meaningful motor skills.

However, what is observed in the literature and recommended in the curriculum documents does not always find real application in the school educational context, which is affected by difficulties caused by the availability of space and equipment as well as the knowledge and skills subtended to the effective planning of gym activities (Coppola & Papa, 2016). This critical issue, in particular, points to two reflections, one of a normative nature and the other of an epistemological nature, both of which are currently the focus of discussions concerning physical education at school.

The first concerns the emerging reflections on the issue of recruiting physical education teachers for primary schools. There is a recent regulatory provision for the inclusion of the competition class "Motor and sport sciences in primary school", such as the graduate in motor sciences as a physical education teacher for the fourth and fifth year of primary school (Law No. 234 of 30 December 2021). The legislation, in fact, on the one hand responds to the pragmatic need to offer job

opportunities to graduates of the different degree courses in motor sciences, on the other hand finds full justification in the recognition of the need for specific training that brings together the knowledge and skills of both the pedagogical and motor-sports matrix, which are indispensable for the effective implementation of educational and didactic interventions in the motor field.

The second reflection, set in a cause-effect relationship with the first, refers to what psycho-pedagogical and neuroscientific studies are helping to demonstrate on the individual/environment interaction, learning in general, motor learning in particular, and inclusion. The consideration of the scientific literature that developed on these three different, overlapping directives, invites reflection on how much the structuring of physical activities, according to a linear approach that, consistently with previous theories on motor learning, continues to promote the acquisition of motor skills and competences through repetitive, performance-oriented practices, does not respond effectively to the child's educational needs, failing to recognize the complexity underlying the interaction and learning processes of the individual, as well as of the classroom context.

The guidelines for policy makers quality physical education exhort for an educational planning of physical education that is properly thought and adapted to the needs of each pupil. Each primary school pupil, in fact, on the basis of personal physical characteristics, as well as his or her own experiential background, will manifest different levels of motor 'functioning', in terms of activity and participation, strongly influenced by the characteristics of the physical and social environment within which the activities will be promoted and implemented (WHO, 2007). Primary school physical education design and implementation practices must provide all children with the opportunity to participate, through an individualized and personalized structuring of activities and the environment, which is able to respond meaningfully and effectively to the different personal characteristics (individual constraints) of each child, using movement as a mediator of learning processes and the environment as an invitation to initiative and self-organization for the development of meaningful movement experiences (Rudd et al., 2021).

Setting the planning and implementation of physical education in primary school within the *ecological perspective* (Gibson, 1979) and *non-linear pedagogy* (Chow et al., 2007; Chow, 2013), responds to the need to continue to recognize in the context of meaningful movement experiences, the indispensable role played by the child's spontaneous initiative, and by the environment in terms of affordances to action. It is also essential, in this interaction, to consider the psychosomatic unity of the child, as the only possible condition for its own functioning in interaction with the

environment, and the complexity subtended to the interaction between the two, child-environment, both complex dynamic systems in continuous co-evolution.

2. Motor learning and new consciousness: between intentionality and environment

National and international scientific literature is proceeding, consistently across different fields of knowledge and in different contexts of observation/reflection, to frame the themes of interaction, cognition and motor learning within a single integrating background that recognizes the existence of a circular dialogue between the processes of cognition, perception/action and emotion (Gallese et al., 2006; Glenberg, 2008; Barsalou, 2010; Caruana & Borghi, 2016). This perspective determines important consequences in the reflections around the topic of the planning of motor-sports activities to be declined in the school educational context, above all, in an indispensable consideration of inclusive dynamics. In reflecting on motor learning processes, it is necessary to place the planning and implementation of motor-sports activities, which involve various biological, psychological and social components, under a multi-perspective lens, in which one recognizes the complex and non-linear holistic nature of the interaction between the individual and the (physical and social) environment (Thompson & Varela, 2001). «The paradigm of complexity, on the same wave of neuroscience, invites to take a systemic perspective, starting from the awareness that there is no boundary between what is physical and what is cognitive and that the environment around us is able to modulate our brain circuits» (D'Anna et al., 2021, p. 343).

Studies coming from different fields of knowledge, from pedagogy to psychology, from anatomy to physiology and even neuroscience, allow to describe the motor system as a complex cognitive system, involved in the programming and planning of actions and purposeful movements (Lakoff & Johnson 1999; Berthoz & Petit, 2006; Rizzolatti & Sinigaglia, 2006; Gallese et al. 1996).

Thus, the idea that motor learning is the result of a complex and co-evolutionary dynamic interaction between the individual and the environment, emerges. From this simple reflection, it is possible to grasp important elements of overlapping between the reflections on motor learning processes and the theme of the individual's *functioning* (in terms of *activity* and *participation)*, understood as the result of a complex relationship between the individual's personal factors (*body structures and functions*) and environmental factors typical to the context in which the subject interacts (WHO, 2001; 2007).

The dynamic ecological approach, conceived and declined both in the motor-sports field and in the inclusive one, suggests the planning of a learning context that is rich

in terms of variations and *affordances* (Gibson, 1979) and "open" in terms of the possibilities of offered action, that is able to promote meaningful movement experiences, through the involvement of the child in its different possibilities of participation (physical, psychic, cognitive and social). In this sense, «[...] perception is, therefore, a process of searching for the 'specifying' information that can be used to guide the generation of solutions and answers» (Chow et al., 2020, cit. in Rudd et al., 2021, p. 81).

Setting physical education in close continuity with the new awareness concerning both motor learning processes and inclusion, is necessary to consider the pursuit of the principles of bio-psycho-social well-being and self-determination as a common sense horizon.

The scientific literature in the field of motor skills attributes the construct of self-determination to the subject's spontaneous motor behavior, which is an expression of intrinsic motivation and consists of «to try something new, challenge oneself on an already learned skill, or develop new skills» (Ryan & Deci, 2007, p. 2). The authors argue that «If the behaviors undertaken by participants are intrinsically motivated, an activity will be performed out of interest, enjoyment, and/or satisfaction, where the purpose of the activity is the activity itself without the influence of consequences or threats of external or internal origin» (Deci et al., 1996; Sanli et al., 2013, p. 2). After all, «Play is voluntary and often has no extrinsic goals; it is fun and often spontaneous. Children are often seen actively engaged in and passionately engrossed in play; this builds executive functioning skills and contributes to school readiness (bored children will not learn well)» (Yogman et al., 2018, p. 2).

Bernštejn first described movement intentionality as a goal-oriented organization of motor action, emerging from a «[...] continuous adaptation of the body to variable information from the environment» (cited in Borgogni & Agosti, 2022, p. 130). So, the studies (Anochin et al., 1973; Lurija, 1977) describe the difference between sensation and perception, that gives value to experience and directs the organization of movement, which takes on characteristics of intentionality (Agosti, 2021; Borgogni & Agosti, 2022).

The non-linear approach suggests an effective *manipulation of constraints* (individual, environment, task) (Newell, 1986; Davids et al., 2008) as a tool capable of fostering the processes of exploration and identification of possible movement solutions and thus facilitating motor learning (Chow et al., 2006; Renshaw et al., 2016). In fact, such an approach promotes the subject's self-organization, as well as a less conscious control of movement, which will be implicitly performed, and

which will lead to individualized and personalized functional solutions for each child (Correia et al., 2018).

The principles related to the dynamic ecological approaches and non-linear pedagogy, as well as the *Constraint led-approach*, are in perfect continuity and coherence with the principles underlying inclusive practices that encourage the introduction of variations in the context in order to increase the possibilities of functioning and pursue for the subject the principles of activity and participation. It is appropriate to highlight, at this point, a final element of continuity between the described part, about motor learning and what is promoted in the psychomotor field, in educational/relational practices and in clinical/rehabilitative helping situations. Psychomotricity, in fact, assumes as a founding principle of practice the recognition of the psychosomatic unity of the child, favoring meaningful movement experiences starting from the exploration of the child's spontaneous initiatives as an expression of interests and abilities, therefore, of its emerging competences (Gison et al., 2019) within an unstructured and open playful context, which favors the exploration of the environment. Psychomotricity, therefore, offers the opportunity for each child to delineate for themselves the developmental process along a proximal developmental scale defined *in itinere* in a flexible manner with the adult intervening on the environment and not directly on the child.

Similarly, in pursuing the principles of non-linear pedagogy declined in the context of physical education at school, it is necessary, also and above all in an inclusive vision to be implemented at school, to promote physical education teaching practices that are respectful of intentionality, individual potential and that provide for an indirect structuring of the context in order to foster possibilities for effective activity and participation for all.

Acknowledging the importance of the child's spontaneous initiative, however, does not mean eliminating the objective underlying the motor action, but instead it means considering the greater incisiveness of a self-determined objective, resulting from the co-determination of individual constraints and affordances in the environment. It means preferring a non-linear approach in which, through the organization of the environment and the structuring of open or semi-structured tasks, it is possible to observe in a more authentic manner the child's real possibilities of action and/or functioning and to consciously and responsibly manipulate the constraints, in order to orient and favor the acquisition of exploratory and intentional behavior, functional movements, adaptive functions and motor skills.

3. Video modeling as intentionality observation tool

It's clear how important it is «[...] to invest in the training of future physical education teachers, so that they develop the ability to design learning environments that are accessible and rewarding for all, in which [...] each student is placed in a position to take an active role [...]» (Visentin et al., 2022, p. 88).
A non-linear approach to motor activities, as it encourages the child's free initiative, does not require less expertise, commitment or "presence in the field" from the teacher. Working on the learning environment and on open tasks also requires the teacher to be able to "think before": this is a forecasting ability that the teacher can and must develop in the course of training and experience and which can also be refined through the effective use of video modelling as a training tool. Contrary to a traditional approach, which would consider an aprioristic and homogeneous planning of repetitive activities of increasing complexity designed and implemented 'equally for everyone', the physical education teacher must, on the other hand, be a competent, aware and responsible designer of a learning context (Rudd et al., 2021) that allows the greatest possible participation by the children, all of them, far from a competitive climate and a performance-oriented corrective approach (Coppola & Papa, 2015). Physical education only in this way can fulfil its task of promoting the integral development of the personality and those personal, cognitive and social skills that can be spent in life. The teacher must have an adequate presence of affordances in the environment, recognizing "before" the different function performed by each of them, which will depend on the affordance itself, the constraints of the task and the individual constraints of each child involved in that specific activity.
In previous research experiences, conducted in the context of teacher training, the potential of using video modelling in the context of the Specialization Course for Support workshops were discussed, in activities of observing the child in spontaneous play situations, with a specific study of the functional interpersonal and inter-body dynamics to promoting inclusion (Gomez Paloma & Minghelli, 2022; Minghelli, 2022).
It's important to reflect on the possible use of this specific didactic strategy in the training of future physical education teachers, to orient them «towards a deep knowledge and understanding of their pupils' subjective configurations, emerging from the way their strengths and weaknesses interact [...]» (Aiello, 2015, p. 23). In the parallelism highlighted several times between the principles subtended to the planning and implementation of motor activities and those of inclusive processes, it is clear how much the two contexts (motor and inclusive) share, as a single denominator, the recognition of the centrality of the body, understood as the

"object" and "subject" of interpersonal relationships, of child/environment interdependence and, more generally, of inclusive motor learning processes.
Specifically, it's clear how important both the training of support teachers and that intended for future physical education teachers concern cognitive and psychological contents, closely connected to reflections of a practical-experiential order. According to the construct of *bodily format representation* (Goldman, 2009; Caruana & Borghi, 2016), in fact, the latter are linked to bodily information and representations that, more than just theoretical treatment, are capable of showing and providing an understanding of the nature and evolution of learning processes and effective and inclusive interpersonal relationships.
The two approaches, moreover, share the possibility of observing intentionality and initiatives as tools for the expression of the child's functioning possibilities and movement abilities, in order to enable the teacher to plan an environment and tasks for the child that evolve in parallel with its potential.
Getting back to the theme of complexity, described here in relation to the school educational context, as well as motor learning processes, the scientific literature describes video modelling in training processes as a «pedagogical amplifier capable of facilitating the observation of activities, reducing the gap between theory and practice» (Impedovo, 2018; Colella & Vasciarelli, 2020, p. 18), capable of making «[…] tangible the complexity inherent to real classroom contexts» (Idem, p. 23).
The studies around the *mirror system* (Rizzolatti et al., 1996; Gallese, 2007), contribute to understand the training potential of video modelling, which represents a particularly useful strategy to support processes of simulation and understanding of real situations observed thanks to a skillful use of technologies in education. The identification of the neuronal areas related to *embodied simulation* skill (Gallese, 2009), is particularly useful in reflecting on how vision is able to place the trainee teacher in the condition of observing and therefore perceiving and acting, in a simulated manner, educational situations, previously selected by the educator.
In the field of motor activities, studies identify different potentialities in the use of video: in particular, the use of video-analysis, in which similarly to video-feedback the teacher observes him/herself in teaching practices, seems to support «the teaching and evaluation of skills (Harris, 2009). Physical education teachers through a reflexive approach (Nishihara & Yonemura, 2017) based on video analysis (Santagata, 2012) can: immerse themselves in teaching; identify interactions; reinforce collaborations and activities; stimulate selective motivation-attention (Gaudin et al., 2018)» (Colella & Vasciarelli, 2020, p.18).

Video modelling, on the other hand, proposes the concept of the interaction between the expert teacher and the pupils, offering the future physical education teacher the possibility of view the same frame countless times. This element is particularly effective in the motor sphere, where activities take place in an extremely rich and variable context in terms of movement situations that evolve continuously and sometimes abruptly together with environmental characteristics, again determining relational and participation dynamics.

Repeated view of the different frames would also offer the opportunity to observe situations by choosing and shifting the focus as needed, first on the child, to observe its motor investment and understand which affordances and or task constraints have favored or hindered participation; subsequently on the teacher, to observe how, at a distance, it is possible to propose activities by intervening on the environmental and task constraints, and to understand how less structured activities actually favor a wider possibility of participation and represent a valuable opportunity to identify the potential and competences of each pupil. If we understand which offerings within the environment are most "inviting" to a group of children, we will be able to manipulate key constraints in a learning environment to lead students to seek and discover effective solutions to a movement problem (Rudd et al., 2021). Practitioners can manipulate constraints to shift student intentions to support the development of new motor patterns and skills. The repeated, dilated, dissected observation of the video would therefore allow for an analysis of the educational-motor situations, from a global point of view and from a perspective dissected into the individual constituent elements: from the motor investment and initiatives of the child, to the strategies and adjustments of the expert teacher; from the characteristics of the environment and therefore from the arrangement of the affordances and their progressive manipulation, to the composition of the social context, in terms of numbers and peer interactions.

In this sense the technological tool together with the mediation of the trainer offer the opportunity to perceive and imagine the outcomes of real situations, of effective interactions, as well as to formulate hypotheses and forecasts on them and to redesign them in the future, as teachers.

The purpose is to promote the use of motor behavior observation as a guiding element for planning effective motor-inclusive times, spaces, relationships and interactions, to encourage the identification of emerging skills and competences and the structuring of learning and exploration environments that are in continuity with the observed abilities, while respecting the specificities of each child. Above all from an inclusive perspective, finally, the observation of the child's bodily investment, of the participation modes, of the choices made in relation to the

context's affordances, aims to make the child identify, recognize and return to its interests and motivations, potential, to progressively identify possible strategies and modes of intervention that can be implemented in a flexible, individualized and customized manner.

Conclusions

In conclusion, at a time when the debate on the professionalization of the physical education teacher at primary school is fertile, it is necessary in the educational sphere to take into account the complexity underlying school educational contexts, as well as motor learning processes, recognizing how, especially in the school context, motor activities represent a valuable opportunity for children to participate and evolve in terms of motor, cognitive, personal and social skills, transferable to all contexts of life.

Schools has to plan and implement accessible and inclusive teaching practices that observe the principles of individualization and personalization to foster self-determination. The aim of this contribution was to reflect on the potential of the use of video modelling in the training of future physical education teachers to foster the acquisition of skills in the observation of real-life situations in order to promote the planning of more effective and inclusive educational interventions in the field of motor education.

As described above, as part of the workshops planned within the framework of the specialization courses for support, observation experiences were carried out that aimed to enable teachers to acquire the ability to identify elements relating to: competences, functioning and sense-making initiatives on the part of the child; the teacher's objectives and inclusive strategies; contextual variables (physical and social). These experiences, which allow to bridge the gap between theory and practice, highlighted how far there is still a long way to go for motor activities at school to truly represent a moment of growth for the child and, above all, of inclusion.

The new awareness on physical literacy and, more generally, on motor learning, considers as predictive and facilitating factors for the development of functional movements and the acquisition of motor skills, the placing of the child within meaningful movement experiences, in which the child is offered the opportunity to explore and find personal movement solutions, in a climate of trust and fun. In particular, in the reflections on the school context, which we have seen in terms of its periodicity and accessibility plays an essential role in fostering physical literacy, it is appropriate to emphasize its educational task, such as that of "bringing out" the possibilities, knowledge and peculiarities of each pupil. In order for the

educational dimension of motor activities to be fulfilled, it is necessary to restore the child's power of action, to be able to recognize the meaning of its choices, to be able to accept them, orient them and make them evolve, in an ecological evolutionary process in which the principles of participation and self-determination are respected.
Considering the new awareness reached in the area of motor learning, it is appropriate to create training opportunities that "show" how unstructured and spontaneous situations in the motor field, if consciously planned and implemented, foster processes of self-organization of movement, starting from which the child's exploratory and decisive possibilities increase, its experiential baggage; and, finally, how much this positively affects the development and acquisition of functional movements, executive functions and motor skills, as well as the establishment of inclusive dynamics.

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