# BODY, MOVEMENT AND WELL-BEING IN PRIMARY SCHOOLS: A QUASI-EXPERIMENTAL MIXED-METHODS STUDY ON THE EFFECTIVENESS OF AN INTEGRATED PHYSICAL EDUCATION MODEL FOR PROMOTING PHYSICAL AND MENTAL WELL-BEING AND INCLUSION IN SCHOOLS

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**ABSTRACT**
This study investigates the effectiveness of a movement-based educational intervention in primary schools to promote well-being, inclusion and school participation. Using a quasi-experimental mixed-methods design with 84 pupils aged 8–10, the 12-week intervention included cooperative physical activities, embodied games and psychomotor pathways. Results showed improvements in emotional well-being, school engagement, interpersonal skills and motivation towards physical activity, while qualitative findings highlighted greater inclusion, peer cooperation and reduced oppositional behaviour.

**KEYWORDS**
Physical education; psychophysical well-being; school inclusion; primary school; embodied pedagogy.

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## 1. Introduction

In recent years, the relationship between education, physical activity and well-being has taken on increasing prominence within European pedagogical, scientific and political discourse. Recent regulatory changes in Italy concerning the recognition of kinesiology professions and the introduction of specialist physical education in primary schools represent a significant historical step in the process of redefining the educational role of sports science and the pedagogy of movement. In particular, the inclusion of the educational, social and psychophysical value of sporting activity within Article 33 of the Italian Constitution has marked a significant cultural shift, recognising physical activity not merely as a recreational or competitive pursuit, but as a fundamental element in the holistic development of the individual and in the promotion of individual and collective well-being.

This perspective forms part of a broader international framework that regards physical activity as an educational right and a tool for human, social and relational development. International organisations such as UNESCO (2015) and the World Health Organisation (WHO, 2020) emphasise that movement and physical activity are essential for physical and mental health, the prevention of ill-being, and the creation of inclusive and sustainable educational environments. In particular, the WHO guidelines highlight that regular physical activity during childhood contributes significantly to children's cognitive, emotional and social development, improving attention, memory, self-regulation and the quality of interpersonal relationships.

At the same time, contemporary pedagogical debate has progressively moved beyond a dualistic conception of the person, based on the separation of mind and body, to embrace theoretical approaches that interpret learning as an embodied, situated and relational process. It is within this context that the

paradigm of embodied cognition is situated, according to which cognitive processes cannot be understood independently of bodily experience and dynamic interaction with the environment (Barsalou, 2020; Gallagher, 2017). According to this perspective, the body is not merely an executive tool subordinate to the mind, but constitutes an active component in the construction of meaning, the regulation of emotions and learning processes. Cognitive neuroscience has further reinforced this view, demonstrating how perception, action, emotion and cognition are deeply interconnected. Neuroscientific studies demonstrate, in fact, that learning simultaneously involves sensorimotor, attentional and emotional systems, highlighting how bodily experience can facilitate memory, conceptual understanding and motivation to learn (Immordino-Yang & Damasio, 2007). From this perspective, movement takes on a cross-cutting educational function, capable of supporting not only physical development but also cognitive, social and emotional skills. Within the school context, these theoretical shifts have fostered the spread of active and participatory pedagogical approaches aimed at enhancing bodily experience. Embodied, cooperative and workshop-based methodologies place the active involvement of the student, the experiential dimension and the shared construction of knowledge at the centre of learning. Such approaches appear particularly relevant in primary school, a developmental stage in which the body represents one of the main cognitive, relational and emotional mediators of the educational experience.

The international literature highlights how physical activity in schools can have a positive influence on numerous aspects of child development. Bailey et al. (2009) emphasise that movement-based educational programmes promote social skills, self-esteem, collaboration and engagement in school. Similarly, Donnelly et al. (2016) highlight how regular physical activity improves executive functions, attention span and academic performance. Furthermore, Diamond

(2015) emphasises that physical activities that integrate cognitive components and coordination are particularly effective in developing self-regulation and executive functions in children.

In the school setting, physical activity also plays a significant role in promoting inclusion. Cooperative physical activities help to reduce communication and relational barriers, encouraging active participation even among students with Special Educational Needs, Specific Learning Disorders or socio-emotional difficulties. According to Booth and Ainscow (2011), the creation of inclusive school environments requires educational practices capable of fostering participation, a sense of belonging and peer collaboration. From this perspective, movement and cooperative play represent particularly effective pedagogical tools for promoting inclusive experiences and reducing dynamics of social exclusion.

Socio-constructivist theories of learning also support the educational value of physical and relational experiences. Vygotsky (1978) highlights how cognitive development emerges through social interaction and cultural mediation. Collaborative physical activities foster processes of mutual scaffolding, peer learning and shared knowledge construction, contributing to the development of communication and relational skills.

At the same time, the growing interest in well-being at school has led many scholars to emphasise the link between movement, positive emotions and the quality of the educational experience. Seligman (2011), within the framework of Positive Education, highlights how psychological well-being represents a fundamental condition for meaningful learning. From this perspective, physical activities can help develop positive emotions, intrinsic motivation, a sense of efficacy and resilience.

Physical activity also appears to be closely linked to processes of emotional regulation. Physical experiences, especially when structured in a cooperative

rather than competitive manner, promote the recognition of emotions, stress management and impulse control (Ratey & Hagerman, 2008). These aspects are particularly relevant in the contemporary school context, characterised by a growing increase in attention, behavioural and emotional difficulties among children of school age.

In recent years, the concept of Physical Literacy has also gained increasing prominence in the international landscape of physical education and sports science. Whitehead (2010) defines Physical Literacy as the motivation, confidence, physical competence, knowledge and understanding necessary to value and take responsibility for participation in physical activities throughout one's life. This concept goes beyond a purely technical view of motor skills, instead emphasising the identity-related, relational and motivational dimensions of bodily experience.

In the Italian context, the introduction of specialist physical education teachers in primary schools represents a significant transformation, including at a methodological and professional level. This reform recognises the specific educational and didactic nature of physical education, placing central importance on specialist professional skills in the design of educational programmes geared towards well-being, inclusion and the holistic development of the individual. This perspective is consistent with the European process of harmonising professional competences in the field of kinesiology and preventive and adapted physical activities.

From a pedagogical perspective, these transformations require a comprehensive rethinking of traditional educational models. Contemporary schools are, in fact, called upon to move beyond transmissive and sedentary approaches to promote more dynamic, inclusive and participatory learning environments. In this context, movement is not merely a subject-specific

content, but a genuine cross-curricular educational methodology capable of fostering meaningful learning, active participation and psychophysical well-being.

Despite growing scientific attention to these issues, the Italian landscape still features a relatively limited number of mixed-methods experimental studies focused on the impact of embodied physical education in primary schools. Indeed, much international research highlights the need to integrate quantitative and qualitative approaches to understand the complexity of the educational and relational processes activated through movement (Creswell & Plano Clark, 2018). A mixed-methods approach allows for the simultaneous analysis of both measurable changes in psychological and behavioural dimensions and the subjective perceptions, relational dynamics and meanings attributed by students to their lived experiences.

In light of these theoretical, pedagogical and normative considerations, this study aims to evaluate the effectiveness of an educational intervention based on bodily movement and embodied pedagogy in promoting psychophysical well-being, school inclusion and active participation in primary school. In particular, the research aims to analyse the impact of cooperative and embodied physical activities on students' emotional, relational and motivational dimensions, thereby helping to expand the body of scientific evidence regarding the educational role of physical education in contemporary school settings.

## 2. Aim and hypothesis of the research

The study aims to: Hypotheses

1. assess the impact of an integrated physical education programme on pupils' psychological well-being;
2. analyse the effects of the intervention on school engagement and inclusive participation;
3. explore the qualitative perceptions of students and teachers regarding the proposed educational experience.

- H1: the experimental group will show a significant increase in emotional well-being compared to the control group;
- H2: the experimental group will demonstrate higher levels of engagement and a sense of belonging at school;
- H3: the intervention will foster more inclusive and cooperative relational dynamics.

## 3. Methods

### 3.1. Research design

This study adopted a convergent mixed-methods approach (Creswell & Plano Clark, 2018), characterised by the parallel integration of quantitative and qualitative data in order to gain a broader and more nuanced understanding of the educational phenomenon under analysis. This methodological choice appears particularly well-suited to the study of complex school contexts, in

which cognitive, emotional, physical and relational dimensions are closely interlinked and difficult to interpret through a single epistemological perspective.

The use of a mixed-methods approach allows for the integration of objectively measurable data relating to observable changes in students with qualitative elements useful for understanding perceptions, experiences, relational dynamics and meanings attributed to the educational experience. In the pedagogical and inclusive context, this methodological integration makes it possible to move beyond a reductionist view of learning processes, offering a multi-level interpretation of educational phenomena whilst simultaneously valuing statistical evidence and experiential dimensions (Johnson & Onwuegbuzie, 2004).

The study is configured as a quasi-experimental study with non-equivalent experimental and control groups, structured according to a pre-test/post-test design. This design was chosen as it is particularly suited to real-world school contexts, in which complete randomisation of participants is often difficult to achieve for organisational, ethical and institutional reasons (Cohen, Manion, & Morrison, 2018). The presence of a control group, however, helped to strengthen the internal reliability of the study, allowing for a comparison between students involved in the embodied intervention and those following the traditional physical education curriculum.

The educational intervention was implemented within the natural school setting, without significantly altering the usual organisation of teaching activities. This methodological choice allowed for the maintenance of high ecological validity in the research, facilitating the observation of educational processes in authentic, everyday situations. Indeed, the literature highlights how studies conducted in real educational settings are more effective in

capturing the complexity of the relational, motivational and participatory dynamics typical of school contexts (Bronfenbrenner, 1979). The convergent design involved the simultaneous collection of quantitative and qualitative data during the various phases of the experiment. The quantitative data were used to detect any changes in levels of psychological well-being, engagement with school, participation and motivation towards physical activity, whilst the qualitative component allowed for an in-depth exploration of the students' subjective experiences and the teachers' perceptions regarding the effects of the intervention. The results were integrated during the final interpretative phase through a process of methodological triangulation, aimed at verifying convergences, divergences and complementarities between the various sources of information.

From an operational perspective, the research protocol was divided into four main phases:

1. preliminary phase of observing the school context and defining the sample;
2. administration of the quantitative pre-test instruments and commencement of systematic observations;
3. implementation of the embodied educational intervention in the experimental group;
4. administration of the post-test, collection of qualitative interviews and integration of data.

The total duration of the trial was twelve weeks, a period considered adequate by the international literature for observing significant changes in the motivational, relational and participatory dimensions linked to school physical activity (Donnelly et al., 2016). During the programme, the experimental group

took part in embodied physical activity workshops designed according to principles of cooperation, experiential learning and inclusion, whilst the control group followed the traditional curricular activities provided for in the standard school timetable. The decision to use a quasi-experimental mixed-methods approach is also consistent with recent perspectives in inclusive pedagogy and transformative educational research, which emphasise the need to interpret learning as a multidimensional and situated phenomenon (Mortari, 2007). In particular, the embodied approach adopted in the study considers the body not merely as an executive tool, but as a cognitive, emotional and relational mediator in the processes of knowledge construction. Therefore, an exclusively quantitative methodology would have risked reducing the complexity of the educational experience observed, neglecting fundamental elements such as the quality of interactions, emotional engagement and the students' subjective experiences. The qualitative component of the research thus assumes a complementary and interpretative role in relation to the statistical data, allowing for an in-depth exploration of how pupils experienced the embodied activities and how these experiences influenced relational, motivational and inclusive dynamics within the classroom. Systematic observations, focus groups and semi-structured interviews enabled the collection of narrative data useful for understanding not only 'whether' the intervention produced changes, but also 'how' such transformations unfolded within the everyday educational context.

From an epistemological perspective, the research is situated within a pragmatist approach to mixed-methods research, according to which understanding educational phenomena requires the integrated use of different methodological strategies geared towards solving concrete problems (Tashakkori & Teddlie, 2010). This approach is particularly well-suited to the study of inclusive and participatory processes, which are characterised by high

complexity and multidimensionality. Finally, the entire research protocol was developed in accordance with the ethical principles of educational research. Informed consent was obtained from the parents of the students involved, and the anonymisation of data, the confidentiality of the information collected, and the protection of the participants' psychological well-being were ensured throughout all phases of the study.

### 3.2. Participants

The research sample consisted of 84 pupils attending an Italian primary school, in Years 3 and 4, aged between 8 and 10. The pupils came from a school located in an urban area of southern Italy characterised by socio-cultural diversity and a range of educational needs.

The participants were divided into two existing class groups:

- Experimental group: n = 42
- Control group: n = 42

The experimental group took part in the embodied educational programme based on cooperative and inclusive physical activities, whilst the control group followed the standard curricular activities set out in the school timetable. The decision to use existing natural classes is consistent with the quasi-experimental design adopted and with the need to preserve the organisational and relational balance of the school environment.

Inclusion criteria

The study included students who met the following criteria:

- · regular school attendance;
- · informed consent signed by parents or legal guardians;
- · no medical contraindications to taking part in school physical education;
- · participation in at least 80% of the activities scheduled during the trial period.

Exclusion criteria

The following students were excluded from the study:

- · severe motor impairments incompatible with the proposed activities;
- · absences exceeding 20% of the programme;
- · lack of parental consent to participate in the study.

The sample also included pupils with Special Educational Needs (SEN) and Specific Learning Disorders (SLD), who were included in the activities in accordance with the principles of inclusive education and Universal Design for Learning (UDL). The activities were adapted through cooperative strategies, body-based mediation and methodological differentiation in order to ensure the active participation of all students, regardless of individual characteristics or any difficulties they might have.
The presence of students with different cognitive, relational and emotional profiles also made it possible to observe the effectiveness of the embodied intervention in terms of school inclusion, participation and the quality of peer interactions.

### 3.3. Educational Intervention

The educational programme was designed in accordance with the principles of embodied pedagogy, experiential learning and inclusive teaching, with the aim of promoting the physical and mental wellbeing, active participation and interpersonal skills of primary school pupils through physical movement. The pilot programme lasted a total of 12 weeks and consisted of two weekly sessions of 90 minutes each, making a total of 24 workshop sessions.

The structure of the intervention was developed by a kinesiologist specialising in Preventive and Adapted Physical Activity (APA) in collaboration with the subject teachers, in order to ensure pedagogical coherence, inclusivity and interdisciplinary integration with regular school activities. The design took into account the developmental characteristics of pupils aged 8–10, emphasising playful, cooperative and multisensory approaches consistent with the literature on bodily learning in childhood (Pesce et al., 2021).

Each session was organised into four main parts:

1. initial phase of physical and motivational warm-up;
2. core embodied activities;
3. reflective and cooperative activities;
4. final debriefing and circle time.

The choice of a ritualised and predictable structure responded to the need to create a psychologically safe and inclusive environment, which is particularly important for pupils with SEN and SLD. The literature highlights how structured routines and cooperative contexts can promote self-regulation, participation and a reduction in school anxiety (Immordino-Yang & Damasio, 2007).

## Embodied cooperative games

A central part of the programme was devoted to embodied cooperative games, designed to promote collaboration, motor coordination, non-verbal communication and a sense of belonging to the group. The activities included physical problem-solving exercises, group obstacle courses, cooperative balance games and motor synchronisation activities.
For example, pupils were asked to carry objects by using their bodies in coordination with their peers, or to create collective figures through shared movements. In other activities, the children had to complete motor courses by helping one another or guiding blindfolded peers through verbal and bodily cues.
These practices are grounded in embodied and socioconstructivist literature, according to which shared movement and bodily cooperation foster the construction of knowledge and the consolidation of social relationships (Vygotsky, 1978; Gallagher, 2017). Bailey et al. (2009) also highlight that cooperative games reduce competitive and exclusionary dynamics, increasing participation and a sense of inclusion within the class group.

## Psychomotor circuits

The sessions included psychomotor circuits structured around movement circuits aimed at developing coordination, balance, spatial orientation and executive functions. The courses involved jumping, crawling, dynamic balancing, obstacle crossing, rhythmic exercises and motor sequences integrated with cognitive tasks.
In some activities, students had to memorise movement sequences, solve simple motor problems or associate specific movements with auditory and visual stimuli. The integration of motor and cognitive components appears

consistent with the studies by Diamond (2015), which highlight how physical activities characterised by planning, coordination and cognitive control can promote the development of executive functions and self-regulation in children.

From a pedagogical perspective, the psychomotor courses were also designed to promote body awareness and a sense of self-efficacy. The opportunity to tackle gradual motor challenges adaptable to different levels of ability allowed the pupils to experience success, motivation and confidence in their own abilities. According to Bandura (1997), experiences of mastery are in fact one of the main factors in the development of perceived self-efficacy.

Emotional regulation activities through movement

A significant component of the intervention was dedicated to activities involving bodily emotional regulation. Through breathing exercises, dynamic relaxation, expressive movement and body awareness, the students were guided in recognising and managing their emotions.

The activities included 'emotional movement' exercises, in which the children physically represented different emotions through posture, rhythm, intensity of movement and use of space. Subsequently, the emotions experienced were verbalised and shared during guided discussion sessions.

Neuroscientific literature highlights how the body and emotions are deeply interconnected and how movement can significantly influence emotional regulation processes (Ratey & Hagerman, 2008). Embodied practices enable the development of emotional awareness, impulse control and self-regulation skills, aspects that are particularly relevant in primary school.

### Symbolic play and physical role-play

The intervention also included symbolic play and physical role-play activities aimed at developing imagination, empathy and social skills. The pupils took part in movement-based storytelling and dramatisations in which the body became a tool for symbolic representation.
For example, the children simulated collaborative situations or everyday problems using movement to represent emotions, relationships and conflict resolution strategies. In some activities, the pupils portrayed natural elements, characters or environments through body language and group coordination. According to Bruner (1996), symbolic play is a fundamental tool for identity construction and the development of narrative and social skills. The physical dimension of role-playing also fosters processes of identification and empathy, contributing to improved peer relationships and an understanding of others' emotions.

### Interdisciplinary physical activities

Embodied activities were also integrated with curricular subject content through interdisciplinary approaches geared towards active learning. Some activities linked movement to mathematics, Italian language, science and geography.
For example, pupils solved simple maths problems through movement sequences, represented words or grammatical categories through body postures, or simulated natural phenomena through collective movements. Such practices are consistent with the embodied perspective, according to which conceptual understanding can be facilitated by bodily and multisensory mediation (Barsalou, 2020).
The integration of movement and subject-specific learning is also supported by

the studies of Donnelly et al. (2016), which highlight how physical activity integrated into the school curriculum can improve attention, motivation and academic performance.

Reflective circle time sessions following activities

At the end of each session, reflective circle time sessions were held during which the pupils shared their emotions, difficulties, perceptions and experiences relating to the activities carried out. The circle time provided a space for verbalising and processing the physical experience, with the aim of fostering mutual listening, emotional awareness and class cohesion.

Teachers and the kinesiologist facilitated the discussion through open-ended questions and dialogue strategies designed to encourage participation from all students. These reflective moments are consistent with the principles of active pedagogy and reflective education, according to which meaningful learning arises from the opportunity to critically reflect on lived experience (Dewey, 1938).

Peer collaboration and cooperative learning

The intervention consistently emphasised practices of peer collaboration and cooperative learning. Indeed, many activities involved the formation of small, heterogeneous groups in which students were required to collaborate to achieve shared objectives.
The composition of the groups was structured to promote inclusion, mutual support and the valuing of individual differences. Students with greater motor or social skills often took on support and facilitation roles for classmates experiencing difficulties.
The literature highlights how cooperative learning fosters social skills, empathy,

a sense of belonging and intrinsic motivation (Johnson & Johnson, 2009). In particular, in inclusive settings, cooperative practices reduce isolation and stigmatisation, increasing the active participation of students with different educational needs.

Control group activities

The control group followed the standard school curriculum for physical education as set out in the school's regular programme. The activities were primarily geared towards the development of basic motor skills and characterised by a more directive structure, with less focus on embodied, cooperative and emotional-relational dimensions.
The absence of structured reflective activities, systematic cooperative practices and interdisciplinary integration made it possible to compare the effects of the embodied model with those of the traditional approach to school physical education.

## 4. Tools

### 4.1. Quantitative tools

The quantitative data collection was carried out using standardised and internationally validated instruments, selected in line with the study's objectives and the main dimensions under investigation: emotional well-being, school participation, engagement, social relationships and motivation towards physical activity. The decision to use validated instruments responds to the need to ensure methodological reliability, comparability of results and the scientific rigour of educational research (Cohen, Manion, & Morrison, 2018). The instruments were administered during pre- and post-test phases to both the experimental group and the control group, in order to detect any changes

associated with the embodied intervention. The administration procedures were adapted to the students' age, using accessible language, teacher mediation and explanatory aids where necessary.

Strengths and Difficulties Questionnaire (SDQ)

To assess socio-emotional skills and behavioural difficulties, the Strengths and Difficulties Questionnaire (SDQ) developed by Goodman (1997) was used; this is one of the most widely used tools internationally for assessing psychological well-being in children and adolescents. The questionnaire allows for the analysis of five main dimensions:

· emotional symptoms;

· behavioural problems;

· hyperactivity/inattention;

· peer relationship problems;

· prosocial behaviour.

The instrument consists of Likert-scale items and demonstrates good levels of psychometric reliability and cross-cultural validity. The literature highlights that the SDQ is a particularly effective tool for assessing socio-emotional functioning in school settings and monitoring the effects of educational interventions aimed at well-being and inclusion (Stone et al., 2010).
In the present study, the use of the SDQ allowed us to observe any changes in relational behaviours, emotional regulation and levels of social participation among the students involved in the embodied motor intervention.

Physical Activity Enjoyment Scale (PACES)

To assess the enjoyment perceived during physical activity, the Physical Activity Enjoyment Scale (PACES) was used, originally developed by Kendzierski and DeCarlo (1991) and subsequently adapted for children and adolescents. The scale measures the degree of enjoyment, satisfaction and emotional engagement associated with physical activity. Intrinsic motivation and perceived enjoyment are, in fact, fundamental dimensions in promoting physical activity during childhood and in fostering positive attitudes towards movement (Deci & Ryan, 2000).
In the school setting, high levels of enjoyment are associated with greater participation, motivation, engagement and persistence in physical activities. The literature also highlights how cooperative, rather than exclusively competitive, activities foster greater emotional involvement and a reduction in performance anxiety in children (Bailey et al., 2009).

In the present study, the PACES was used to analyse the impact of the embodied approach on the emotional quality of the physical experience and on students' relationship with bodily movement.

Psychological Sense of School Membership (PSSM)

The sense of school belonging was assessed using the Psychological Sense of School Membership (PSSM) developed by Goodenow (1993). The instrument measures the extent to which students perceive acceptance, inclusion, recognition and support within the school community.
The educational literature highlights how a sense of belonging constitutes a central variable in processes of school well-being, motivation and the prevention of social exclusion (Osterman, 2000). Students who perceive high levels of belonging tend, in fact, to demonstrate greater engagement,

participation and quality of interpersonal relationships.
In the present study, the PSSM enabled us to assess whether embodied and cooperative activities fostered the consolidation of peer relationships and the improvement of the inclusive classroom climate.

Leuven Involvement Scale for Young Children

To observe students' active involvement, the Leuven Involvement Scale for Young Children, developed by Laevers (1994), was used. This observational scale allows for the assessment of pupils' cognitive, emotional and motivational engagement during educational activities.
According to Laevers, engagement represents one of the most significant indicators of the quality of the educational experience, as it reflects concentration, interest, mental energy and authentic participation in the learning process.
The observational scale considers various behavioural indicators, including:

- attention and concentration;
- motivation;
- persistence in the task;
- positive emotional expression;
- personal initiative;
- interaction with the environment and peers.

The use of this tool appears particularly consistent with the embodied approach adopted in the research, as it allows for the observation of students' engagement within experiential and cooperative motor activities.

### 4.2. Qualitative tools

The qualitative component of the research was designed to explore the subjective perceptions of students and teachers regarding the embodied experience, examining relational dynamics, emotional experiences and the meanings attributed to the activities carried out.
The qualitative approach served as a complement to the quantitative data collection, allowing for a more in-depth interpretation of the educational processes observed and enabling the capture of aspects that are difficult to reduce to numerical data.

Structured systematic observations

During the intervention, structured systematic observations were carried out within the physical activities. The observations focused on:

- active participation;
- quality of peer interactions;
- cooperative behaviours;
- emotional regulation;
- levels of engagement;
- any dynamics of exclusion or social withdrawal.

The observations were carried out by the research team using observation grids developed on the basis of the literature on inclusive educational contexts and the pedagogy of movement. Systematic observation is, in fact, a particularly important tool in educational research, as it allows for the analysis of students' behaviour within authentic and natural contexts (Mortari, 2007).

Focus groups with teachers

At the end of the trial, semi-structured focus groups were conducted with the teachers involved in the project. The focus groups enabled the collection of reflections regarding:

· changes observed in the students;

· the classroom atmosphere;

· the participation of pupils with SEN and SLD;

· the pedagogical effectiveness of embodied activities;

· critical issues that emerged during the process.

The dialogic interaction typical of focus groups facilitated the shared construction of meaning and collective reflection on the educational experience.

Semi-structured interviews with students

Semi-structured interviews were also conducted with students in the experimental group. The interviews explored:

· perceptions of the physical activities;

· emotions experienced during the programme;

· relationships with classmates;

· sense of participation and inclusion;

· preferences regarding the activities carried out.

The questions were formulated using simple language appropriate to the participants' age, fostering a welcoming and non-judgemental communicative atmosphere.

### Researchers' reflective diary

Throughout the experimental programme, the researchers compiled a reflective diary aimed at the systematic documentation of observations, emerging dynamics and methodological reflections.
The journal proved a useful tool for monitoring the evolution of the class group, identifying critical issues, noting significant episodes and supporting the interpretative process of qualitative data. According to Mortari (2007), reflexivity is in fact a fundamental component of qualitative educational research, as it allows the researcher to develop greater awareness of the observed processes and of their own role within the research.

### Qualitative data analysis

Qualitative analysis was carried out using Thematic Analysis according to the model proposed by Braun and Clarke (2006). This methodological approach allows for the identification, organisation and interpretation of recurring themes within the collected narrative data.

The analysis was divided into several phases:

1. familiarisation with the data;
2. initial coding;
3. identification of emerging themes;
4. review and definition of themes;
5. final interpretation of the results.

The use of thematic analysis enabled the integration of quantitative evidence with a deeper understanding of the embodied experiences of the students and the relational transformations observed within the class group.

## 5. Results

### 5.1. Quantitative results

Quantitative analysis of the data revealed statistically significant positive effects of the embodied intervention on the physical and mental well-being, academic engagement and quality of social relationships of students in the experimental group.

Prior to the intervention, the two groups exhibited substantially similar levels across the main variables considered, with no statistically significant differences in the mean scores recorded using the assessment tools. This allowed the observed variations to be attributed with greater reliability to the effects of the embodied educational programme implemented during the trial. At the end of the 12 weeks, the experimental group showed significant improvements in all dimensions investigated compared to the control group, which, by contrast, did not show any statistically significant changes. The results suggest that the integration of cooperative motor activities, embodied practices and reflective strategies contributed to promoting the emotional well-being, motivation and school engagement of the students involved. In particular, statistically significant improvements emerged in relation to: The data also confirm findings from the international literature, according to which educational programmes based on movement and cooperation can produce positive effects on cognitive, emotional and relational dimensions in school contexts (Donnelly et al., 2016; Pesce et al., 2021).

- emotional and behavioural well-being;
- school engagement;
- sense of belonging to the school community;
- perceived enjoyment during physical activity;
- active participation and involvement in activities.

***Table 1.*** *Pre-test and post-test comparison of the experimental group*

| **Variable** | **Pre-test M (DS)** | **Post-test M (DS)** | **p** | **Cohen's d** |
|---|---|---|---|---|
| SDQ | 14.2 (3.1) | 10.8 (2.7) | .003 | .64 |
| PACES | 3.1 (.62) | 4.4 (.51) | < .001 | .88 |
| PSSM | 2.9 (.58) | 3.8 (.49) | .002 | .59 |
| Leuven Scale | 2.8 (.54) | 3.9 (.47) | .001 | .52 |

The results show a significant reduction in scores relating to emotional and behavioural difficulties as measured by the SDQ, and a significant increase in levels of enjoyment of physical activity, engagement with schoolwork and a sense of belonging.

Particularly noteworthy is the increase in the PACES score relating to perceived pleasure during physical activity. This finding suggests that embodied and cooperative activities have fostered greater intrinsic motivation and emotionally positive engagement with physical movement. According to Deci and Ryan (2000), intrinsic motivation is indeed a central factor in meaningful learning processes and active participation.

Scores on the Leuven Involvement Scale also indicate an increase in cognitive and emotional engagement during school activities. Students in the experimental group demonstrated higher levels of concentration, active participation, task persistence and positive emotional expression compared to the initial phase of the study.

***Table 2.*** *Comparison between the experimental group and the control group (post-test)*

| **Variable** | **Experimental Group A (DS)** | **Control Group A (DS)** | **p** |
|---|---|---|---|
| SDQ | 10.8 (2.7) | 13.9 (3.0) | .004 |
| PACES | 4.4 (.51) | 3.2 (.57) | < .001 |
| PSSM | 3.8 (.49) | 3.0 (.55) | .003 |
| Leuven Scale | 3.9 (.47) | 3.1 (.52) | .002 |

A comparison of the two groups in the post-test reveals statistically significant differences in favour of the experimental group across all dimensions considered. The control group, which followed the traditional physical education curriculum, showed no significant changes in levels of engagement, well-being or sense of belonging at school. The absence of significant changes in the control group further reinforces the hypothesis that the improvements observed are attributable to the specific characteristics of the embodied intervention, in particular the cooperative, reflective and experiential dimensions of the activities proposed.

***Table 3.*** *Effect sizes of the main variables analysed*

| Variable | Cohen's d | Interpretation |
|---|---|---|
| SDQ | .64 | Effetto moderato |
| PACES | .88 | Effetto elevato |
| PSSM | .59 | Effetto moderato |
| Leuven Scale | .52 | Effetto moderato |

The effect sizes calculated using Cohen's d range from moderate to high, confirming the pedagogical significance of the intervention beyond mere statistical significance. In particular, the highest effect size is found in the dimension relating to perceived enjoyment during physical activity (PACES), suggesting that the embodied approach has had a particularly significant impact on students' motivation and emotional engagement.

From an educational perspective, these results appear particularly relevant as pleasure and engagement are dimensions closely linked to school participation, intrinsic motivation and the development of positive attitudes towards learning (Seligman, 2011).

Further descriptive analyses revealed that students with SEN and SLD in the experimental group showed significantly higher levels of participation compared to the initial phase of the research. Teachers observed a greater willingness to collaborate, a reduction in oppositional behaviour and an increase in positive interaction with peers. Although these data were not analysed separately using specific statistical inferences due to the small size of

the subgroup, the observational evidence suggests potential inclusive effects of the embodied approach even for students with greater educational vulnerabilities.

Overall, the quantitative results appear to confirm the effectiveness of the embodied motor intervention in promoting psychological and physical well-being and school participation in primary school, supporting theoretical perspectives that interpret movement as an educational, relational and inclusive tool.

### 5.2. Qualitative results

The qualitative analysis of the data collected through systematic observations, focus groups with teachers, semi-structured interviews with students and the researchers' reflective diary enabled us to explore in depth the relational, emotional and participatory changes that emerged during the embodied learning process.

The use of thematic analysis according to Braun and Clarke (2006) enabled the identification of four main macro-themes, closely interlinked and consistent with the research objectives. The qualitative results confirm and enrich the quantitative evidence, offering a deeper understanding of the educational processes activated through bodily movement and cooperative practices. Analysis of the narrative data also highlights how the embodied experience produced changes not only at the behavioural and motivational levels, but also in the quality of peer relationships, the classroom atmosphere and the subjective perception of movement as a meaningful educational experience.

Greater inclusive participation

One of the most recurring themes concerns the increase in active and inclusive participation within the class group. During the activities, students progressively showed greater engagement even in the most complex collaborative situations, participating with less fear of judgement and a greater willingness to share.

Systematic observations revealed that, in the first few weeks of the intervention, some pupils initially tended to adopt withdrawn or passive attitudes, particularly during cooperative activities requiring physical exposure and direct interaction with classmates. However, as the positive relational climate gradually took hold, these students began to participate with greater confidence and spontaneity.

The involvement of pupils with SEN and SLDs proved particularly significant, as they demonstrated higher levels of participation in the embodied context compared to traditional school activities. Teachers highlighted how cooperative physical activities had reduced certain communication and performance barriers frequently encountered in traditional teaching activities.

One teacher stated: “Some children who normally participated little during lectures felt freer to express themselves and collaborate in cooperative physical activities.”

The students themselves described the activities as “more fun”, “less stressful” and “easier to do together”, highlighting how movement and cooperation fostered an atmosphere perceived as more welcoming and inclusive.

These findings appear consistent with the literature on inclusive pedagogy, which suggests that cooperative and multimodal educational environments promote participation, a sense of belonging and a reduction in processes of social exclusion (Booth & Ainscow, 2011).

Improved peer relationships

The second theme that emerged concerns the improvement of social relationships and cooperative dynamics among students. Embodied activities, characterised by physical collaboration, shared problem-solving and positive interdependence, have fostered higher-quality peer interactions. During the trial, behaviours more oriented towards mutual support, active listening and cooperation were observed. Cooperative physical activities also helped to reduce instances of social exclusion and conflict. Some pupils initially perceived as marginalised within the group gradually took on more active roles and gained recognition from their peers.

During the focus groups, teachers highlighted how shared physical work had fostered the development of new relationships between pupils who previously had little interaction with one another.

One teacher stated: “The cooperative activities have shifted some of the dynamics in the class. Children who tended to keep to themselves have started to collaborate spontaneously.”

Interviews with students also revealed positive perceptions regarding collaboration: “I enjoyed helping my classmates with the activities.” “We did things together and no one was left out.”

From a theoretical perspective, this evidence is consistent with studies on cooperative learning, which highlight how activities based on shared goals foster empathy, positive interdependence and the development of social skills (Johnson & Johnson, 2009).

Emotional regulation and self-confidence

A further theme that emerged concerns the improvement in students' emotional regulation and self-confidence.
Teachers observed a gradual reduction in oppositional, impulsive and disengaged behaviour within the experimental group, accompanied by an increase in emotional self-regulation and the ability to cope with frustration. The embodied activities focused on body awareness and emotional expression appear to have fostered a greater ability to recognise and verbalise their emotions. In particular, expressive movement exercises and reflective circle times allowed students to share emotional experiences in a non-judgemental setting. One teacher observed:

"The children gradually learnt to calm down and listen to each other more. Even those who tended to react impulsively seemed more in control." Some pupils also expressed a greater sense of self-efficacy and personal confidence:

"At first I was afraid of making mistakes, but then I felt more confident."

"I liked it when we managed to do the activities together."

Neuroscientific and pedagogical literature highlights how physical movement can support processes of emotional self-regulation, stress reduction and the development of self-confidence (Ratey & Hagerman, 2008). Embodied practices are, in fact, particularly effective in promoting integration between the physical, cognitive and emotional dimensions.

The central role of movement in learning

The final theme that emerged concerns the perception of movement as a factor that facilitates learning and academic motivation.
Many students described embodied activities as more engaging than traditional teaching methods. Movement was perceived not only as a playful

experience, but also as a means of supporting comprehension, attention and memorisation. The students highlighted how interdisciplinary movement-based activities made learning “easier”, “more fun” and “less boring”. Some children said they remembered the content covered through physical activity and play better.

One student said: “When we did maths with movement, I understood it better.” Another said: “Moving around helped me pay more attention.”

Teachers confirmed that during embodied activities, students demonstrated higher levels of concentration, motivation and active participation. These findings appear consistent with the embodied paradigm and with studies highlighting the role of the body in knowledge-building processes (Barsalou, 2020). According to this perspective, learning and movement are deeply interconnected, as bodily experience contributes to conceptual understanding and the construction of meaning.

## 6. Discussion

The results of this study confirm the initial hypotheses and support the scientific evidence recognising the role of physical activity in promoting psychological and physical well-being, educational inclusion and active participation in educational settings. The embodied intervention implemented in the experimental group has, in fact, produced significant improvements in the students’ emotional, relational and motivational dimensions, highlighting the pedagogical potential of physical movement as a cross-curricular educational tool.

The quantitative data show significant increases in levels of school engagement, sense of belonging, emotional well-being and perceived

enjoyment during physical activity. At the same time, the qualitative results highlight positive changes in classroom dynamics, inclusive participation and processes of emotional self-regulation. The integration of these two methodological components therefore allows us to interpret the intervention's effectiveness not only in terms of improvements in measurable indicators, but also as an educational experience capable of profoundly influencing the quality of relationships and the school climate.

These findings are consistent with the studies by Diamond (2015), according to which physical activities characterised by coordination, cooperation and cognitive control promote the development of executive functions, attention and self-regulation in children. In the present study, embodied activities appear to have supported processes of concentration, emotion regulation and active participation, confirming the link between bodily movement and cognitive development highlighted by the neuroscientific literature.

The theoretical perspectives of embodied cognition also appear to be fully supported by the findings. According to Barsalou (2020), cognition cannot be interpreted as an abstract and disembodied process, but emerges through the dynamic interaction between body, environment and experience. From this perspective, movement does not simply support learning, but participates directly in the construction of meaning and cognitive processes. The perceptions expressed by the students, who described movement as a factor facilitating understanding, motivation and attention, seem to confirm this theoretical interpretation.

Qualitative evidence also shows how bodily movement has fostered relational and emotional processes fundamental to meaningful learning. Embodied cooperative activities have helped to build a more inclusive and participatory atmosphere, reducing instances of isolation and fostering positive peer interactions. These results appear consistent with Johnson and Johnson's

(2009) studies on cooperative learning, according to which educational experiences based on shared goals and positive interdependence improve social skills, a sense of belonging and the quality of interpersonal relationships. Particularly significant is the involvement of students with SEN and SLD, who, in the embodied context, demonstrated higher levels of participation compared to traditional school activities. Cooperative and multimodal physical activities appear, in fact, to have reduced certain communication and performance barriers frequently present in traditional, teacher-centred teaching contexts. This evidence is consistent with the principles of Universal Design for Learning (CAST, 2018), which emphasise the importance of offering different modes of participation, expression and engagement to promote the inclusion of all students.

From an emotional perspective, the intervention appears to have fostered greater capacity for self-regulation and emotional management. Teachers observed a reduction in oppositional and impulsive behaviours, accompanied by an increase in self-confidence and willingness to collaborate. These results appear consistent with the studies by Ratey and Hagerman (2008), which highlight how physical movement can positively influence the neurobiological processes linked to emotional regulation, stress reduction and motivation. The centrality of movement in learning also emerges as one of the most significant aspects of the study. Students frequently described embodied activities as ‘more engaging’, ‘more fun’ and ‘easier to understand’ compared to traditional teaching methods. These perceptions are consistent with the literature on experiential and situated learning (Dewey, 1938; Kolb, 1984), according to which learning is most effective when students actively participate through concrete, bodily and meaningful experiences.

Vygotsky’s (1978) socioconstructivist theory also appears relevant for interpreting the findings. Cooperative physical activities have, in fact, fostered

socially mediated learning processes, in which discussion, mutual support and peer interaction have contributed to the shared construction of knowledge. The body thus becomes not merely a motor tool, but a relational and cognitive mediator within educational processes.

From a pedagogical perspective, the results suggest the need to move beyond predominantly sedentary, transmissive and lecture-centred school models, in order to promote more active, physical and participatory teaching approaches. Numerous international studies highlight how dynamic and multimodal educational environments can foster engagement, well-being and meaningful learning (Donnelly et al., 2016). From this perspective, physical activity cannot be considered merely a separate curricular subject distinct from other areas of learning, but rather a cross-curricular educational tool capable of supporting cognitive development, social inclusion and psychological well-being.

The findings are particularly significant in light of recent changes to Italian legislation, which have introduced specialist physical education in primary schools and recognised the educational value of sport within Article 33 of the Italian Constitution. This study appears, in fact, to support the need to enhance the professional standing of kinesiologists and other specialists in the field of physical education within educational contexts, recognising their contribution not only in terms of motor skills but also in pedagogical, relational and inclusive terms.

Furthermore, the results obtained appear consistent with the concept of Physical Literacy developed by Whitehead (2010), according to which movement represents a fundamental dimension for the construction of identity, motivation and active participation throughout the lifespan. The embodied activities proposed appear, in fact, to have fostered not only motor skills, but also confidence, body awareness and positive attitudes towards movement.

Overall, the study contributes to expanding the body of scientific evidence regarding the effectiveness of embodied practices in primary schools, highlighting the educational value of movement as a tool for inclusion, well-being and democratic participation.

## 7. Limitations of the study

Despite the positive results obtained, this study has certain methodological limitations that must be taken into account when interpreting the data.
A first limitation concerns the convenience sampling used in the research. The students involved came from a single school and were not selected through complete randomisation procedures. Although this choice is consistent with the quasi-experimental design adopted in real educational contexts, it limits the possibility of generalising the results to wider school populations that are socio-culturally different.
A further limitation is the relatively short duration of the intervention, lasting twelve weeks. Although this period proved sufficient to observe significant improvements in the main variables considered, it does not allow for the verification of the stability of the effects in the long term. The literature indeed highlights the importance of longitudinal studies for understanding the persistence of changes relating to well-being, motivation and school participation (Bailey et al., 2009).
Furthermore, the study did not include longitudinal follow-ups after the conclusion of the trial. Consequently, it was not possible to verify whether the observed improvements were sustained over time or had a lasting influence on the students' academic and social behaviour. Future research could therefore

include longitudinal assessments months or years after the intervention, in order to analyse the evolution of the embodied effects in the medium and long term.

From a statistical perspective, the relatively small sample size further limits the possibility of generalising the results to different contexts. In particular, the small number of students with SEN and SLD did not allow for specific inferential analyses of the subgroups, despite qualitative evidence suggesting significant potential inclusive effects of the intervention. Future research could further explore the impact of embodied practices on specific categories of students with educational, attentional or relational vulnerabilities.

A further limitation concerns the possible influence of contextual variables that are difficult to control, such as the classroom atmosphere, teachers' relational style, or students' individual characteristics. In real educational contexts, in fact, learning processes are influenced by multiple interacting factors that cannot be completely isolated through rigid experimental procedures (Bronfenbrenner, 1979).

From a methodological perspective, the integration of quantitative and qualitative data is certainly a strength of the study, but it also entails potential interpretative challenges linked to the subjectivity of qualitative analysis. Although triangulation and systematic coding procedures were adopted, the risk of interpretations being influenced by the researchers' perspective cannot be completely ruled out.

Despite these limitations, the study makes significant contributions to educational and pedagogical research on embodied practices in primary schools. The findings suggest the need to develop further mixed-methods experimental studies on larger and more diverse samples, involving different school and socio-cultural contexts.

Future research could also explore:

- · the longitudinal effects of embodied practices on school well-being;
- · the relationship between movement, subject-specific learning and executive functions;
- · the impact of embodied activities on pupils with SEN, SLD or ADHD;
- · the role of digital technologies integrated into physical activities;
- · the training of teachers and physical education specialists in inclusive school settings.

In conclusion, despite the limitations highlighted, this study confirms the educational, relational and inclusive potential of physical movement in contemporary school settings, contributing to the scientific debate regarding the role of physical education and embodied pedagogy in primary schools.

## 8. Conclusion

This study highlights how educational programmes based on physical movement and embodied pedagogy can serve as effective tools for promoting physical and mental wellbeing, inclusive participation and engagement with school life in primary schools. The integration of cooperative physical activities, reflective practices and experiential approaches has, in fact, produced positive effects not only in terms of motor skills, but also in the emotional, relational and motivational aspects of pupils' lives.
Both quantitative and qualitative results converge in showing how physical movement can foster more meaningful and participatory learning processes, contributing to the development of self-regulation, a sense of belonging and social skills. In particular, embodied activities appear to have created

educational conditions conducive to the active participation of all pupils, including those with Special Educational Needs and Specific Learning Disorders, confirming the inclusive value of cooperative and multimodal practices. The evidence that has emerged appears consistent with the paradigm of embodied cognition (Barsalou, 2020; Gallagher, 2017), according to which body, emotion and cognition constitute deeply interconnected dimensions in the processes of knowledge construction. From this perspective, learning cannot be reduced to a purely abstract and cognitive activity, but develops through bodily, relational and situated experiences that engage the whole person. The study's findings appear to confirm that movement can act as a cognitive and emotional mediator, facilitating attention, motivation and understanding.

Neuroscientific perspectives also support the educational importance of movement. Recent studies highlight how physical activity can positively influence the development of executive functions, working memory and emotional regulation in children (Diamond, 2015; Ratey & Hagerman, 2008). From this perspective, the body is not merely an accessory to the school experience, but a fundamental component of cognitive and relational development.

From a pedagogical point of view, the results suggest the need to rethink traditional educational models, which remain heavily centred on transmissive and sedentary approaches. Contemporary schools are, in fact, called upon to create more dynamic, cooperative and inclusive learning environments, in which movement can be valued as a cross-curricular educational experience and not exclusively as a separate subject-specific content. The embodied activities proposed in the study demonstrated how movement can promote not only psychophysical well-being, but also democratic participation, collaboration and the quality of peer relationships.

The evidence obtained also supports the recognition of the specific educational value of kinesiology and highlights the professional value of the kinesiologist within school contexts. The presence of specialist professionals competent in designing preventive, adapted and inclusive physical activities appears particularly relevant in an education system geared towards promoting the overall well-being of the individual. From this perspective, recent developments in Italian legislation regarding the introduction of specialist physical education in primary schools and the constitutional recognition of the educational value of sport appear consistent with the latest international scientific evidence.

This study therefore contributes to the pedagogical and scientific debate on the educational potential of bodily movement, highlighting how embodied practices can serve as effective tools for supporting inclusion, well-being and meaningful learning in contemporary school settings. At the same time, the findings underscore the importance of developing further experimental and longitudinal research capable of exploring the effects of embodied methodologies across different school levels and socio-cultural contexts.

In conclusion, movement emerges not merely as physical activity or a school subject, but as a holistic educational experience capable of integrating cognitive, emotional, bodily and relational dimensions. Embodied pedagogy and inclusive physical practices therefore appear to offer particularly significant prospects for the creation of a school that is more participatory, inclusive and oriented towards the harmonious development of the individual.

**References**


Bailey, R., Armour, K., Kirk, D., Jess, M., Pickup, I., Sandford, R., & BERA Physical Education and Sport Pedagogy Special Interest Group. (2009). The educational benefits claimed for physical education and school sport: An academic review. *Research Papers in Education, 24*(1), 1–27. https://doi.org/10.1080/02671520701809817

Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman.

Barsalou, L. W. (2020). Challenges and opportunities for grounding cognition. *Journal of Cognition, 3*(1), 31. https://doi.org/10.5334/joc.116

Booth, T., & Ainscow, M. (2011). *Index for inclusion: Developing learning and participation in schools* (3rd ed.). Centre for Studies on Inclusive Education.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Bruner, J. (1996). *The culture of education*. Harvard University Press.

CAST. (2018). *Universal design for learning guidelines version 2.2*. CAST. http://udlguidelines.cast.org

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage.

Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Dewey, J. (1938). *Experience and education*. Macmillan.

Diamond, A. (2015). Effects of physical exercise on executive functions: Going beyond simply moving to moving with thought. *Annals of Sports Medicine and Research, 2*(1), 1011.

Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., Lambourne, K., & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: A systematic review. *Medicine & Science in Sports & Exercise, 48*(6), 1197–1222. https://doi.org/10.1249/MSS.0000000000000901

Gallagher, S. (2017). *Enactivist interventions: Rethinking the mind*. Oxford University Press.

Goodenow, C. (1993). The psychological sense of school membership among adolescents: Scale development and educational correlates. *Psychology in the Schools, 30*(1), 79–90. https://doi.org/10.1002/1520-6807(199301)30:1<79::AID-PITS2310300113>3.0.CO;2-X

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38*(5), 581–586. https://doi.org/10.1111/j.1469-7610.1997.tb01545.x

Immordino-Yang, M. H., & Damasio, A. (2007). We feel, therefore we learn: The relevance of affective and social neuroscience to education. *Mind, Brain, and Education, 1*(1), 3–10. https://doi.org/10.1111/j.1751-228X.2007.00004.x

Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher, 38*(5), 365–379. https://doi.org/10.3102/0013189X09339057

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14–26. https://doi.org/10.3102/0013189X033007014

Kendzierski, D., & DeCarlo, K. J. (1991). Physical Activity Enjoyment Scale: Two validation studies. *Journal of Sport and Exercise Psychology, 13*(1), 50–64. https://doi.org/10.1123/jsep.13.1.50

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.

Laevers, F. (1994). *The Leuven involvement scale for young children manual*. Centre for Experiential Education.

Mortari, L. (2007). *Cultura della ricerca e pedagogia: Prospettive epistemologiche*. Carocci.

Osterman, K. F. (2000). Students' need for belonging in the school community. *Review of Educational Research, 70*(3), 323–367. https://doi.org/10.3102/00346543070003323

Organizzazione Mondiale della Sanità. (2020). *WHO guidelines on physical activity and sedentary behaviour*. World Health Organization.

Pesce, C., Marchetti, R., Motta, A., Bellucci, M., & Gómez-Paloma, F. (2021). Physical activity and educational achievement: Insights from embodied cognition research. *Formazione & Insegnamento, 19*(1), 85–101.

Ratey, J. J., & Hagerman, E. (2008). *Spark: The revolutionary new science of exercise and the brain*. Little, Brown and Company.

Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. Free Press.

Stone, L. L., Otten, R., Engels, R. C. M. E., Vermulst, A. A., & Janssens, J. M. A. M. (2010). Psychometric properties of the parent and teacher versions of the Strengths and Difficulties Questionnaire for 4- to 12-year-olds: A review. *Clinical Child and Family Psychology Review, 13*(3), 254–274. https://doi.org/10.1007/s10567-010-0071-2

Tashakkori, A., & Teddlie, C. (2010). *SAGE handbook of mixed methods in social & behavioral research* (2nd ed.). Sage.

UNESCO. (2015). *Quality physical education (QPE): Guidelines for policy-makers*. UNESCO Publishing.

Vygotskij, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Whitehead, M. (2010). *Physical literacy: Throughout the lifecourse*. Routledge.