THE ROLE OF PHYSICAL EDUCATION IN STIMULATING SCHOOL INCLUSION AND THE DEVELOPMENT OF MOTOR SKILLS IN PRIMARY SCHOOL

IL RUOLO DELL'EDUCAZIONE FISICA NELLO STIMOLARE L'INCLUSIONE SCOLASTICA E LO SVILUPPO DELLE CAPACITÀ MOTORIE NELLA SCUOLA PRIMARIA

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ABSTRACT
School inclusion is one of the main contemporary educational challenges. Physical education represents a powerful tool to promote inclusion, providing a space where not only motor skills but also social and relational competences are developed. This experimental study analyzes the effect of physical education on the promotion of inclusion in primary school using TGMD-2 to assess motor skill development and SPSI to measure the level of perceived inclusion. A 12-week physical education program was implemented in an Italian primary school, and the results indicate a significant improvement in both motor skill development and the level of social inclusion.

L'inclusione scolastica è una delle principali sfide educative contemporanee. L'educazione motoria rappresenta un potente strumento per favorire l'inclusione, offrendo uno spazio dove si sviluppano non solo abilità motorie, ma anche competenze sociali e relazionali. Questo studio sperimentale analizza l'effetto dell'educazione motoria sulla promozione dell'inclusione nella scuola primaria utilizzando il TGMD-2 per valutare lo sviluppo delle abilità motorie e SPSI per misurare il livello di inclusione percepita. Un programma di educazione motoria di 12 settimane è stato implementato in una scuola primaria italiana, e i risultati indicano un miglioramento significativo sia nello sviluppo delle abilità motorie sia nel livello di inclusione sociale.

KEYWORDS
Physical Education, School Inclusion, Motor Skills, Primary School, Special Educational Needs (SEN)
Educazione Fisica, Inclusione Scolastica, Abilità Motorie, Scuola Primaria, Bisogni Educativi Speciali (BES)

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Introduction

School inclusion represents one of the main challenges of contemporary education. The idea behind inclusion is that all students, regardless of their abilities or disabilities, have the right to fully and actively participate in school life. This concept is well-rooted in international educational policies, as evidenced by key documents from UNESCO and the United Nations Convention on the Rights of Persons with Disabilities (UNESCO, 2005; 2015; 2020; United Nations, 2006). In this context, physical education has emerged as a powerful tool for promoting social inclusion, providing students with a space where not only motor skills are developed, but also relational and social competences, facilitating interaction and mutual acceptance among peers (Bailey, 2006).

School inclusion requires the creation of environments that are welcoming, safe, and capable of valuing individual differences. However, inclusion is not limited to the physical presence of students with special educational needs (SEN) in the classroom; it implies their active and meaningful participation in all activities, including motor activities. Physical education is particularly suited to facilitate this type of participation, as it provides a unique context where all students, regardless of cognitive or physical abilities, can contribute and collaborate (Goodwin & Watkinson, 2000; Sebastiani & Pellegrini, 2024). Some recent studies have demonstrated that structured motor activity can help improve school inclusion, particularly for students with physical or cognitive disabilities (Block, 2016; Top, 2023; Spencer-Cavaliere & Watkinson, 2010).

Moreover, physical education offers learning opportunities that go beyond the development of physical skills. Motor activities, especially group ones, can stimulate transversal competences such as cooperation, problem-solving, and respect for rules, all fundamental components for creating an inclusive environment (Hutzler & Barak, 2017). Recent studies have emphasised that physical education can facilitate the building of interpersonal relationships between students with and without disabilities, improving mutual acceptance and reducing stigma (Di Palma, 2021; Healy, Msetfi, & Gallagher, 2013; Sherrill, 2004). The importance of promoting an inclusive motor context is further highlighted by the growing emphasis on socio-emotional competences in school curricula, considered essential for the holistic development of students (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2020).

Various research has analyzed the effectiveness of inclusive physical education. Spencer-Cavaliere and Watkinson (2010) studied how students perceived

participation in motor activities, finding that the design of inclusive activities promotes the active participation of students with disabilities, fostering greater social acceptance. Similarly, Block (2016) highlighted how the implementation of an inclusive approach in physical education leads to an increase in peer social interactions and a reduction in the marginalization of students with disabilities. Studies conducted in European and North American contexts have shown that participation in inclusive motor programs has positive effects on both motor development and the perception of social inclusion of students with SEN (Fitzgerald, 2012; Vickerman & Maher, 2018).

The importance of assessing the effectiveness of inclusive physical education programs cannot be underestimated. There are various tools to measure the development of motor skills, including the Test of Gross Motor Development - Second Edition (TGMD-2) (Ulrich, 2000), which is widely used to evaluate the level of motor development in children. However, assessing social inclusion requires specific tools such as the Scale of Perceived Social Inclusion (SPSI), which measures the level of perceived inclusion by students in the school context. This tool, validated internationally, evaluates how students perceive their involvement in school activities and their acceptance within the group (Thompson, 2019).

The existing literature thus underscores the importance of physical education as a tool for promoting school inclusion and improving the motor and social skills of students, particularly those with SEN. However, further research is needed to fully understand the impact of specific interventions in this area and to optimise educational programs, ensuring they meet the inclusion needs of all students. This study aims to contribute to this literature by exploring the effect of a structured physical education program on promoting school inclusion in primary school, using the TGMD-2 and the Scale of Perceived Social Inclusion (SPSI) as key assessment tools.

1. Research Structure: Objectives, Methodology, Sample, and Assessment Tools

The main purpose of this study is to evaluate the role of physical education in promoting school inclusion in primary schools; in this regard, three specific objectives are developed:

- Measure the effect of a structured physical education program on motor skill development using the TGMD-2.

- Examine the relative increase in the level of perceived social inclusion through the Scale of Perceived Social Inclusion (SPSI).
- Explore teachers' perceptions and experiences regarding the inclusion process, stimulated by the experimental physical education program, through structured interviews.

The research methodology used was of the mixed methods type, where the quantitative approach involved the "student" dimension, while the qualitative approach concerned the "teacher" dimension.

The study involved 100 students aged 6 to 10 attending a primary school in the city of Caserta (Campania Region, Italy), of which 20 had certified special educational needs (SEN). The participants were divided into two groups: an experimental group of 50 students (including 10 with SEN) and a control group of 50 students (including 10 with SEN). The experimental group participated in the structured physical education program for 12 weeks, while the control group followed the regular physical education curriculum. The sample of teachers consisted of 10 individuals who also attended a preliminary training program on how to facilitate an inclusive environment, manage group dynamics, and promote positive social interactions in the classroom context. These teachers were continuously supported in adapting the educational activities so that every child could participate, regardless of their abilities, thus allowing for the effective delivery of the experimental physical education program.

The evaluation process for the quantitative investigation utilised two internationally validated instruments:

- TGMD-2 (Test of Gross Motor Development - Second Edition): The TGMD-2 is a well-established tool for assessing gross motor skill development. It evaluates two main categories of skills: (1) locomotor skills, such as running and jumping, and (2) object control skills, such as throwing and catching. It was administered both before and after the intervention to monitor progress in motor skills.
- SPSI (Scale of Perceived Social Inclusion): The SPSI is an internationally validated scale for measuring the level of perceived social inclusion among students. This instrument evaluates the perception of acceptance, participation, and peer support in the school context. The scale was administered to students at the beginning and end of the intervention program to measure changes in the level of perceived inclusion.

For the qualitative analysis, teachers were subjected to structured interviews that focused on specific items such as inclusion, student cooperation, and the perception of the motor intervention as a tool for inclusion. The interviews were recorded, transcribed, and thematically analyzed.

2. Description of Experimental Inclusive Educational Activities

The structured physical education program, lasting 12 weeks, included two weekly sessions of 60 minutes each. The program was specifically designed to promote inclusion and the development of motor skills by using cooperative activities and games adapted to the diverse abilities of the students. Emphasis was placed on collaboration, active participation, and building a sense of belonging within the group.

The education program was conceived following principles based on established research in the fields of physical education and school inclusion. Each activity had a dual purpose: to enhance the development of the students' motor skills and to promote school inclusion through cooperation and active participation. Below, the main activities are specified in the table.

Activities	Motor Goals	Inclusive Goals	Description	Theoretical and methodological frameworks
Inclusive team sports	Improve locomotion skills (running, jumping, lateral movement) and object control (throwing and catching). Develop motor coordination and spatial awareness.	Promote cooperation among students by encouraging teamwork and mutual support. Foster the integration of students with special educational	Students were divided into small heterogeneous groups, balancing different motor and cognitive skills to encourage collaboration. An example of a game was "the collaborative	During the activity, the teacher took on the role of facilitator, intervening to support cooperation among group members and providing assistance to students with SEN to ensure

		needs (SEN) through active participation and the overcoming of social barriers.	relay": each group had to carry a ball or another object through a course, making sure not to drop it. To complete the game, the students had to communicate and cooperate, as each member of the group was responsible for a specific part of the motor pathway.	their active participation. According to Dyson (2001), teamwork in physical education contexts significantly contributes to developing social skills such as cooperation, conflict resolution, and empathy, which are fundamental for the process of school inclusion.
Adapted motor pathways	Improve balance and motor coordination. Increase movement precision and body control in confined spaces.	Engage all students, including those with SEN, in a context of mutual support and adaptation of activities to different motor abilities. Create an environment where the differences among students are accepted and valued.	The motor pathways were designed to include obstacles, jumps, and sections to be traversed by walking in balance. Each student, in turn, had to complete part of the path with the help of their teammates. Students with SEN received direct support from their teammates, with roles	The activities were designed to be challenging but not frustrating, using Vygotsky's (1978) principle of the "zone of proximal development," which states that with the support of peers and the teacher, children can perform tasks they would not be able to complete independently. The teacher monitored the groups,

			adapted to their abilities (for example, simplifying some sections of the course or reducing the speed).	encouraging interaction among students and facilitating a culture of mutual support. This approach proved particularly beneficial for students with SEN, who often require more structured support to feel included (Lieberman & Houston-Wilson, 2009).
Coordination and object control exercises	Develop hand-eye coordination and precision in object control (e.g., throwing and catching). Improve strength and dexterity in motor control activities.	Promote the active participation of all students, regardless of their level of motor skills, by adapting the rules of the game. Promote the acceptance of differences in ability, encouraging the appreciation of each participant's contributions.	The activities involved throwing, catching and kicking exercises, with tools of different sizes and weights (e.g. light and soft balls for students with limited motor skills, heavier and larger balls for others). Students were placed in pairs or small groups, with the objective of completing a series of throws and catches at	The principle of 'functional adaptation' (Sherrill, 2004) has been applied to modify the activity according to individual motor skills. This approach aims to ensure that all students can participate successfully and gain a sense of achievement. Teachers promoted self-reflection, inviting students to discuss how they could improve their

			varying distances.	skills and support their peers during motor activities. This approach reflects the concept of 'inclusive education' discussed by Odom et al. (2011), according to which the adaptation of activities and emphasis on social interaction are crucial for inclusion.
Times for collective reflection	Reflecting on improvements in motor skills through the verbalization of one's own experiences.	Fostering mutual awareness and understanding within the group. Promoting the creation of a supportive school community, where students feel accepted and supported by peers.	At the end of each session, the students participated in a brief moment of collective reflection in which they were encouraged to share their experiences of how they had felt during the activities, what they had learnt and how they had contributed to the success of the group.	Teachers facilitated the dialogue, asking open-ended questions to stimulate the participation of all students. The aim was for everyone to reflect not only on their own motor skills, but also on their role in the group dynamics. Collective reflection was designed following the principles of 'reflective pedagogy', as

				proposed by Schön (1983), according to which reflection on experiences enhances learning and promotes greater social awareness.

Table 1: Experimental Inclusive Educational Program

3. Quantitative results

The analysis of the data collected through the Test of Gross Motor Development - Second Edition (TGMD-2) revealed a significant improvement in the motor skills of the students in the experimental group. Progresses were particularly evident in the categories of locomotion and object control, with differences between students with and without special educational needs (SEN).

- *Locomotion skills:*
    - Students with specific motor difficulties (such as motor coordination disorders): In this category, students showed an 18% improvement in basic movements such as running, jumping and sliding. The teachers noted that these students, who at the beginning of the program tended to isolate themselves during motor activities for fear of being judged, gradually gained more confidence in their abilities and began to participate actively.
    - Students without SEN: Students without motor difficulties also showed a 10% improvement over the initial baseline. The improvement was attributed to the increased awareness and respect for the rhythms and abilities of fellow students with SEN, as well as regular practice.
- *Object control skills:*
    - Students with autism spectrum disorders: Students with ASD showed significant progress in object control skills, such as throwing and catching, with a 20% increase in post-intervention performance. In particular, teachers observed that initial

difficulties in interacting with other students were reduced as group activities stimulated social interaction and imitation of peers.

- Students with attention deficit hyperactivity disorder (ADHD): Students with ADHD benefited from structured exercises that required attention and coordination, showing a 15% improvement in throwing and grasping skills. The motor aspect favoured a positive channelling of energy, enabling these students to improve concentration during activities.
- Students without SEN: Also in this category, students without specific difficulties showed a 12% improvement. The teachers pointed out that the focus on the inclusion of all group members made the object control exercises more effective, encouraging positive competition.

- *Perceived Inclusion (SPSI):*

The Scale of Perceived Social Inclusion (SPSI) measured changes in students' perceptions of social inclusion. The results show an overall improvement in the experimental group, with significant variations between students with and without SEN:

- Students with SLD (Specific Learning Disorders): Students with SLD showed a 25% improvement in the perception of inclusion compared to the pre-intervention phase. The improvement was particularly evident in the items related to peer acceptance and active participation in group activities. Many students with learning disabilities, who were initially more withdrawn and less participative, reported feeling more integrated and more involved in daily activities.
- Students with autism spectrum disorders (ASD): Students with ASD experienced a 22% increase in the perception of inclusion. The motor intervention facilitated improved social interaction through moments of collaboration and mutual support. Teachers highlighted how the motor context offers a universal language that overcomes verbal communication difficulties, enabling these students to express themselves through movement and develop new friendships.

- Students with attention deficit hyperactivity disorder (ADHD): Students with ADHD reported an 18% increase in their perception of inclusion. The improvement was attributed to motor activities that promote active engagement and management of excess energy. Teachers reported that these students, who tended to be excluded by peers due to their impulsive behavior, developed greater control over their behavior through exercise, thus promoting better integration into the group.

Students without SEN: Students without SEN reported a 10% improvement in the perception of inclusion. Although the changes were less pronounced than for students with SEN, an increased sense of responsibility towards peers with difficulties was observed. Many students reported feeling more connected to their peers and developed greater empathy.

4. Qualitative results

Structured interviews with teachers provided valuable information on the dynamics of inclusion and the effects of the motor program. The interviews were divided into five main categories, based on the key items discussed:

1. Perception of social inclusion;

Teachers noted a clear decrease in social segregation, with greater interaction between students with and without SEN. In particular, teachers emphasised how group games, which required cooperation and communication between peers, led students to overcome pre-existing relational barriers. A teacher said: '*The motor activities brought out a climate of cooperation among all the children. Even the most withdrawn ones started asking for help or offering it*'.

2. Behavior changes of SEN students;

Teachers observed significant improvements in the behavior of students with ADHD and autism spectrum disorders (ASD). In particular, the teacher of a student with ASD reported: '*I saw Marco smiling and actively participating in group games for the first time, something I had never seen before*.' Most of the teachers confirmed that the collaborative moments required by the motor activities stimulated social involvement and reduced episodes of isolation.

3. Collaboration between students;

A frequently reported aspect was the increased collaboration between peers, especially between students without SEN and those with difficulties. Teachers highlighted how students without specific difficulties learned to consider their classmates with SEN as an integral part of the group. '*I have seen my pupils take care of their peers with more empathy, especially during more complex activities*,' reported a PE teacher.

4. Changes in class dynamics;

Teachers reported that the motor program also had a positive impact on overall class dynamics, reducing conflicts and improving the sense of belonging. One teacher stated: '*The overall class climate has changed. There is now more respect and attention for the difficulties of others, and this is also reflected during class time in the classroom*'.

5. Role of motor education in supporting inclusion;

All the teachers interviewed recognised the importance of motor education as a tool to promote school inclusion. Some teachers expressed the wish to extend the program to the whole school year and to include further moments of reflection and discussion on the topic of inclusion. A support teacher said: '*I firmly believe that motor education has the power to break down barriers. Students learn to cooperate and respect each other through play*'.

5. Discussion and concluding remarks

The results obtained from this study confirm and enrich the existing literature on the role of motor education in school inclusion, which is particularly relevant for students with special educational needs (SEN). The intervention demonstrated how motor education can be used effectively not only to develop physical skills, but also to promote a more inclusive school environment by reducing social barriers and stimulating positive relationships between peers.

The scientific literature has already shown that motor activities can be a powerful tool to foster the inclusion of students with difficulties, as they provide opportunities for collaboration and social interaction. According to Block and Obrusnikova (2007), inclusive physical education can provide positive experiences that promote acceptance of students with disabilities by peers without disabilities. This study supports these conclusions by showing how students in the

experimental group experienced an improvement in both motor skills and perceptions of social inclusion.

Particularly, for students with autism spectrum disorders (ASD), motor education can act as a means to improve not only motor skills, but also social interaction skills. As indicated by Pan (2014), exercise and structured play can improve social interaction in children with ASD. In this study, students with ASD showed a significant improvement in their perception of social inclusion, which suggests that structured physical activity promotes active participation and reduces social isolation.

Students with learning difficulties also benefited significantly from the intervention. It is known that many students with learning difficulties may develop insecurities and low self-esteem due to repeated school failures (Di Palma, 2022; Humphrey, 2008). However, motor activities provide a space where these students can excel and feel competent, increasing their self-esteem and self-confidence. In this study, students with learning difficulties showed significant improvements in both motor skills and perceptions of inclusion, confirming the potential of motor education in supporting their overall development.

Creating spaces for collaboration, as occurs in group motor activities, fosters social interaction and the development of interpersonal skills. Previous studies, such as that of Spencer-Spencer-Cavaliere and Watkinson (2010), emphasise how shared experiences during physical activities foster empathy and collaboration among peers. This study confirmed these findings: the teachers interviewed reported reduced conflict and increased cooperation among students. In particular, teachers noted that students without SEN showed more empathetic and supportive attitudes towards peers with SEN, contributing to a more inclusive environment.

The interviews with the teachers provided a clear picture of the positive effects of motor education on social dynamics within the classroom. This is consistent with existing literature, which highlights that participation in team games and cooperative physical activities can promote a sense of belonging and acceptance (Brock, Rovegno, & Oliver, 2009). Teachers' perceived improvement in the social dynamics among students with and without SEN suggests that motor education can play a crucial role in fostering a culture of inclusion and collaboration.

The literature also emphasises the importance of adapting motor activities to meet the needs of students with SEN. According to the Individuals with Disabilities Education Act (IDEA, 2004), physical education should be customised to enable all

students to participate fully (Block, 2007). In this study, teachers reported that adaptations made to motor activities, such as the modification of game rules and the use of specific tools, facilitated the active participation of students with mild physical disabilities, allowing them to feel an integral part of the group. This suggests that inclusion in motor activities does not happen automatically, but requires targeted planning that takes into account the diversity present in the classroom.

A further interesting aspect that emerged from this study is the correlation between the development of motor skills and perceived social inclusion. Literature suggests that improved motor skills can positively influence self-esteem and self-perception in students, which in turn can increase their social acceptance (Piek, et al, 2005). Students who improve in motor activities are often perceived by their peers as more competent and, consequently, tend to be more included in games and social activities. In this study, students who showed the greatest progress in motor skills also reported the most significant improvements in perceptions of social inclusion, suggesting that physical development can have a positive impact on social dynamics. This finding reinforces the idea that motor education should not only be viewed as an opportunity to improve physical fitness, but also as an opportunity to stimulate social-emotional development.

The results of this study also provide important practical implications for the primary education system. In line with the literature, it is evident that PE can be a powerful tool for promoting inclusion, but a deliberate and well-structured approach is required (Bailey et al., 2009). Schools should invest in inclusive PE programs that involve all students, regardless of their motor or cognitive abilities. Furthermore, teacher training is crucial to ensure that activities are adapted effectively and to promote a culture of acceptance and inclusion.

As in any study, there are some limitations to be considered: firstly, the duration of the intervention was relatively short, and it is not possible to establish whether the observed improvements in motor skills and perceptions of social inclusion are sustainable in the long term; furthermore, the study focused on a specific sample of students with SEN, and the results may not be generalisable to other school populations or to students with more severe special educational needs or otherwise significantly different from a bio-psycho-social perspective.

For future studies, it would therefore be interesting to examine the effects of motor education on other categories of SEN, such as students with sensory disabilities or severe cognitive disabilities. Furthermore, longitudinal research

could explore whether the observed positive effects in social dynamics and motor skills are maintained over time and which variables most influence the success of such interventions.

Certainly, regardless of this, what was analysed brings to light how motor education represents a fundamental didactic-pedagogical resource for promoting school inclusion, especially for students with SEN. This study confirmed that a structured and personalised didactic approach can promote the improvement of motor skills and, at the same time, improve the perception of social inclusion. The results, corroborated by existing literature, highlight the importance of investing in inclusive motor education programs and continuing to research the link between motor development and social dynamics in schools.

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