

Outdoor Sport and Extended Learning

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Abstract: According to UNESCO, a Learning City is configured as an extended learning environment in which meaningful and lifelong learning develops throughout life and is realized through three educational contexts: formal, non-formal and informal. In this perspective, learning can also be interpreted through the concept of extended learning, according to which cognitive processes emerge from the interaction between individuals, the body, the environment and social contexts. Outdoor Education therefore assumes a strategic role as an educational tool capable of enhancing the urban territory.

This study analyzed the contribution of Outdoor Education to the promotion of inclusion processes in urban contexts through the practice of the sport of bocce. A heterogeneous sample of 30 children aged between 9 and 10 years was selected, including pupils with Special Educational Needs. The sample was divided into two groups: an experimental group, consisting of 15 children involved in outdoor activities, and a control group, also consisting of 15 children engaged in indoor activities.

The results of the study confirmed the research hypothesis, highlighting the positive impact of Outdoor Education, mediated by the sport of bocce, on inclusion processes among children. Outdoor Education, through the practice of bocce, can promote social inclusion and contribute to the achievement of the objectives of Learning Cities, supporting the principles of lifelong and extended learning.

Keywords: Learning City; Outdoor Education; Inclusion; Sport Pedagogy; Extended Learning



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1. Introduction

According to UNESCO (2025), a Learning City represents a complex and dynamic urban ecosystem, capable of promoting lifelong, equitable and inclusive learning of citizens throughout their lives. In this perspective, the city is not only a physical or administrative space, but becomes a real extended educational environment, able to mobilize its social, cultural and institutional resources to support the development of skills in formal, non-formal and informal contexts (UNESCO, 2015; 2017). Meaningful and lasting learning in a Learning City is achieved, in fact, thanks to the synergistic integration of these three educational contexts, overcoming the traditional fragmentation between school, community and daily life. As regards the formal

context, characterized by institutionalized education, Learning Cities strengthen the educational system through the construction of territorial educational networks, which encourage collaboration between schools, universities and other training institutions; the development of curricula open to the territory, in which the city enters the school through museums, libraries, urban parks and cultural spaces; and the implementation of policies for equitable access to education, aimed at combating early school leaving and educational inequalities (UNESCO, 2015). In this way, formal contexts do not operate in isolation, but fit into a broader urban learning ecosystem. Alongside formal education, Learning Cities attribute a central role to non-formal contexts, considered a strategic bridge between school, community and citizenship. Non-formal learning is developed through associations and the third sector, adult education and lifelong learning paths, as well as sports and motor activities, which promote participation, socialization and well-being (UNESCO, 2017). These contexts are particularly relevant for the promotion of social inclusion, as they offer learning opportunities that are flexible, accessible and sensitive to the diversity of individual needs and experiences. At the same time, a Learning City recognizes and enhances informal learning, i.e. learning that occurs spontaneously in everyday life, through relationships, experience and participation in the social and cultural life of the city. The contribution of the urban ecosystem is expressed in the availability of educational public spaces, in the promotion of experiential learning, in the development of social and intergenerational relationships and in the support of culture and civic participation (UNESCO, 2017). In this sense, the entire urban context is configured as an environment of continuous learning, capable of supporting the personal and social development of all citizens. The Learning Cities model is also linked to the goals of the 2030 Agenda for Sustainable Development, in particular Goal 4, which aims to ensure quality, equitable and inclusive education and to promote lifelong learning opportunities for all (United Nations, n.d.). In this context, the Learning City is configured as a privileged educational space to promote social inclusion, active citizenship and community cohesion. In light of these considerations, the present research identifies Outdoor Education as a particularly effective educational strategy to promote inclusion within Learning Cities. Outdoor Education pedagogically interprets outdoor and urban space as an active educational environment, in which learning takes place through direct experience, the resolution of real problems and interaction with the environment and with others. In particular, the natural and urban environment favors the plurality of learning styles and allows more flexible relational modalities than traditional educational contexts, making it particularly suitable for inclusive contexts (Farnè, 2020). In this study, an Outdoor Education program based on the practice of the sport of bocce was designed and implemented. The choice of this discipline is motivated by its characteristics of accessibility, adaptability and flexibility, which make it practicable by people with different abilities, contributing to the reduction of barriers to participation. In addition, bocce represents an internationally recognized and Paralympic sport, with the regular participation of athletes with intellectual disabilities and severe physical disabilities, as attested by the relevant federations (FISDIR, 2025; BISFed, 2024). The aim of this work is therefore to understand how Outdoor Education, mediated by the sport of bocce, can be configured as an effective tool for the promotion of inclusion in an urban context. The study involved a sample of 30 primary school children, divided into an experimental group and a control group. The results showed a significant increase in inclusion levels,

together with an improvement in collaboration, positive interaction and active participation of children, confirming the educational and inclusive potential of Outdoor Education within Learning Cities. Outdoor Education and outdoor sports activities represent privileged tools for the promotion of inclusion in urban contexts, through pedagogical, social and environmental mechanisms. Outdoor sport recognizes the body as a central vehicle of learning, overcoming the traditional emphasis on performance and instead valuing participation, experience and relationship. Urban outdoor spaces are generally more accessible than traditional indoor contexts: they are less selective from an economic and social point of view and more easily adaptable to different conditions of ability. This allows a significant reduction of physical, cultural and social barriers, encouraging the active participation of people with disabilities, with Special Educational Needs (SEN) and with different socio-cultural backgrounds. In addition, the outdoors enhances non-formal and informal learning contexts, allowing flexible and inclusive modes of participation. In this way, each subject can identify his or her role within the group, strengthening the sense of belonging and the perception of self-efficacy. Outdoor education also contributes to transforming the city into an educating environment, promoting attitudes of responsibility, care of common spaces and active participation in collective life. Physical practice in natural and urban environments also promotes the reduction of stress and anxiety, increasing psychophysical well-being; this condition represents a fundamental prerequisite for authentic inclusion, which develops within a positive emotional climate (Russo, 2024). Physical activity has a formative, educational and above all inclusive value, aimed at every person regardless of age, gender and the presence or absence of a condition of physical or mental disability. In this perspective, it is increasingly relevant to talk about Physical Education as a process oriented towards the social inclusion of all forms of diversity, from disability to conditions of socio-economic disadvantage. Motor and sports activity thus becomes a tool capable of both educating to inclusion and generating benefits on a social, psycho-physical, educational and relational level, especially for those categories considered "fragile". For people with disabilities or in conditions of physical, economic or social disadvantage, motor and sports practice represents an opportunity to enhance their abilities, even residual ones, and to recognize what they are able to do, in contrast to a social vision often focused on limits. The introduction to motor and sports activity of individuals with intellectual, mental, relational or social difficulties aims, in fact, to promote inclusion, self-esteem and social integration, as well as to prevent the onset of chronic-degenerative diseases and improve the quality of life. In the school environment, at all levels, the promotion of motor and sports activity plays a central role in the pursuit of inclusive objectives, particularly with regard to students with Special Educational Needs (Alam et al., 2024). For students with disabilities, the practice of sport is of increasing importance because it can significantly affect the processes of insertion and reintegration into the class group and the school system. Through the motor and sports experience, the student has the opportunity to experience forms of authentic collaboration, based on reciprocity and not on personal gain, discovering the value of human relationships. The sports context offers a wide range of social interactions — with coaches, teammates and opponents — which allows the subject to experience different emotions, to manage relational conflicts and to modulate behaviors according to the interlocutors. In these dynamics, the subject is recognized specific roles and objectives, favoring the construction of personal identity. Sport is therefore configured as a

multidimensional, dynamic and playful environment, capable of strengthening self-awareness and body awareness, assuming a central role on an emotional, social and inclusive level (Brioa Saez et al., 2025). Included among the Paralympic disciplines, the sport of bocce also offers an important motivational value, thanks to the possibility of participating in structured competitions, a particularly significant element for individuals often exposed to social marginalization. Bocce can be practiced throughout life, from childhood to adulthood, also promoting active and successful aging paths. The practice of this sport stimulates in particular cognitive and psychomotor skills, such as:

- the perception and organization of space;
- the planning of action in relation to the context;
- the coordination of force as a function of distance.

The adaptation of motor intervention to individual characteristics allows, in the sport of bowls, the realization of joint matches and training between people with and without disabilities. This creates an inclusive social environment, in which barriers are progressively overcome spontaneously and naturally. In this context, the person with disabilities is not perceived as a limit, but as an integral part of the group, capable of making a significant contribution.

2. Materials and Methods

The study was conducted in collaboration with the Italian Bocce Federation and several local primary schools, involving a sample of 30 fourth-grade students aged between 9 and 10 years, including pupils with Special Educational Needs (SEN). Participants were selected according to a heterogeneity criterion in order to evaluate the effectiveness of the intervention within a real and inclusive educational context. The sample was divided into two equivalent groups: an experimental group ($n = 15$; 8 males, 7 females, including 5 with SEN), which carried out activities in an outdoor environment, and a control group ($n = 15$; 9 males, 6 females, including 5 with SEN), engaged in indoor activities.

The research design was a quasi-experimental pre-test/post-test with a control group, aimed at evaluating the impact of outdoor motor and sports activities on social inclusion, participation, and peer interactions. The intervention lasted 12 weeks, with two weekly sessions of 60 minutes each, for a total of 24 sessions. The experimental group carried out the activities in the outdoor spaces of a municipal bocce facility, while the control group followed a similar program in an indoor school environment.

The temporal structure of the study included an initial phase (weeks 1–2) with the administration of the Social Inclusion Scale (SIS) questionnaire and structured observation of social behaviors; an intervention phase (weeks 3–10), during which both groups carried out their respective activities with systematic observations conducted in each session; and a final phase (weeks 11–12) with post-test administration and final structured observation.

Two main instruments were used for data collection. The first was the Social Inclusion Scale (SIS), a validated psychometric scale that measures perceived social inclusion in terms of participation, social interaction, and sense of belonging, based on a 4-point Likert scale (1 = not true at all; 4 = completely true). The second instrument was structured observation, focusing on three behavioral indicators: collaboration, active participation, and positive peer interaction, assessed on a scale from

0 to 2 (0 = absent; 1 = occasional; 2 = frequent). Observations were conducted by two observers, one for each group, in order to ensure longitudinal consistency and reduce intra-observer variability.

Quantitative data obtained from the SIS questionnaire were analyzed using non-parametric tests to compare pre- and post-test scores within groups and between groups at the end of the intervention, with the significance level set at $p < 0.05$. Observational data were coded and analyzed through frequencies and qualitative comparisons to integrate information on social behaviors and active participation.

3. Results

The scores of the Social Inclusion Scale (SIS) were analyzed in order to evaluate the effects of the Outdoor Education intervention through the game of bowls on the social inclusion of children.

Table 1. SIS - Social Inclusion Scale results

Group	SIS Pre (M $\pm$ DS)	SIS Post (M $\pm$ DS)	Average Difference
Experimental	33 $\pm$ 3	41 $\pm$ 2	+8
Control	34 $\pm$ 4	35 $\pm$ 3	+1

Table 2. SIS statistical analysis (p-values)

Test pre/post	p
p-value	<0.001
p-value	$p > 0.05$ (not significant)
Test Post Between the groups	
p-value	p-value

The results, as shown in the table, show that the experimental group, which carried out outdoor activities, showed a significant increase in social inclusion scores, going from a pre-test with a mean of 33 and a standard deviation of 3 to a post-test with a mean of 41 and a standard deviation of 2. The control group, which carried out indoor activities, on the other hand, showed a minimal increase, from a pre-test with a mean of 34 and standard deviation of 4 to a post-test with a mean of 35 and standard deviation of 3, so it was not significant (ns). More precisely, as can be seen, in the pre-intervention phase the SIS scores of both groups were similar: 33 ± 3 for the experimental group and 34 ± 4 for the control group. This connotes an equal initial situation between the two groups, excluding the presence of significant differences. In the post-intervention phase, SIS scores change. The experimental group recorded a significant increase in score. Confirming these data, the mean difference shows a greater change in the experimental group. In particular, the experimental group recorded an increase in the average of +8 points, while the control group recorded a minimum increase of +1 point, which was not significant. In addition, as reported, the p-value test was found to be $p < 0.001$ indicating a statistically significant change for the experimental group and not significant for the control group. Comparison between the two groups at post-test, carried out via nonparametric tests, showed significantly higher SIS scores in the experimental group compared to the control group. More precisely, the p-value recorded a p-score < 0.01 , indicating a positive effect of

the outdoor intervention on inclusion. In addition to the quantitative data reported above, structured observations were conducted. The latter were conducted in order to detect real observable behaviors and therefore verify whether the improvements have been translated into concrete behaviors. In particular, the observation of collaborative behaviors, active participation and positive interaction between peers allowed to analyze inclusion as an educational process, reinforcing the validity of the results that emerged from the standardized questionnaires.

Results Qualitative observations:

Table 3. Structured observation scores

Group	Collab Pre (M $\pm$ SD)	Collab Post (M $\pm$ SD)	Participation Pre (M $\pm$ SD)	Participation Post (M $\pm$ SD)	Pre Interaction (M $\pm$ SD)	Post Interaction (M $\pm$ SD)
Experimental	1.0 $\pm$ 0.0	2.0 $\pm$ 0.0	1.1 $\pm$ 0.3	2.0 $\pm$ 0.0	1.1 $\pm$ 0.3	2.0 $\pm$ 0.0
Control	1.0 $\pm$ 0.0	1.0 $\pm$ 0.0	1.1 $\pm$ 0.0	1.0 $\pm$ 0.0	1.0 $\pm$ 0.0	1.0 $\pm$ 0.0

Table 4. Pre-post analysis of observation indicators

Indicator	Group	Test pre/postp-value
Collaboration	Experimental	<0.001
	Control	p > 0.05 (not significant)
Active participation	Experimental	<0.001
	Control	p > 0.05 (not significant)
Positive interaction	Experimental	<0.001
	Control	p > 0.05 (not significant)

Table 5. Test Post Between the groups (**observations**)

<i>p-value</i>	<0.001
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Structured observations on the three behavioral indicators: collaboration, participation and interaction, confirmed the quantitative results. As shown in the table, the pre-intervention collaboration in the two groups was equal, for both initial scores they recorded the mean of 1.0 and the standard deviation of 0.0. The post-intervention tests, on the other hand, recorded a change for the experimental group in the collaboration. More precisely, the post-intervention of the control group recorded a mean of 2.0 and standard deviation of 0.0 while the control group had a mean of 1.0 and a standard deviation of 0.0. As far as active participation is concerned, the two groups recorded fairly similar initial values. The experimental group has the mean of 1.1 and the standard deviation of 0.3 while the control group showed a mean of 1.1 and a standard deviation of 0.0. The results of the post-intervention participation show the control group and changes in the experimental group unchanged, which recorded a mean of 2.0 and a standard deviation of 0.0. The positive pre-test inter-

action, on the other hand, recorded a mean of 1.1 and a standard deviation of 0.3 for the experimental group and a mean of 1.0 and a standard deviation of 0.0 for the control group. The post-test of the positive interaction recorded a change in the experimental group which reported a mean of 2.0 and a standard deviation of 0.0 while the control group remained unchanged. In addition, as reported, the p-value test was found to be $p < 0.001$ indicating a statistically significant change for the experimental group and not significant for the control group. Comparison between the two groups showed statistically significant variations in the experimental group compared to the control group. More precisely, the test recorded a score of $p < 0.01$, indicating a positive effect of the intervention. Overall, the quantitative and qualitative results converge in indicating that the practice of bocce in an Outdoor Education context has fostered inclusion. Therefore, the results indicate that social inclusion in the children in the experimental group increased compared to the control group. The increases were also evident in terms of participation, collaboration and positive interaction between peers.

4. Discussion

The results of the study highlight how Outdoor Education through a program of the bocce discipline can promote inclusion in the Learning City landscape. The results show a significant increase in inclusion and behaviors observed in the experimental group. The control group, on the other hand, showed no statistically significant changes. The use of non-parametric tests also made it possible to confirm the robustness of the results, reducing the risk of violation of statistical assumptions related to the sample size and the nature of the measurement scales. These data are consistent with the international literature highlighting the role of Outdoor Education and adapted sport in fostering inclusion in urban contexts (O'Farrell & Liu, 2020; Zanato, 2018). Therefore, these results are part of the literature that recognizes Outdoor Education as effective tools for the promotion of social inclusion by emphasizing the importance of accessible and community-oriented educational practices (Giunti et al., 2022; Kelly et al., 2022). In particular, learning in an outdoor environment allows a reorganization of traditional relational dynamics, favoring more flexible and less hierarchical modes of participation than in indoor contexts. Therefore, the increase in the levels of inclusion in the experimental group is attributed to the characteristics of Outdoor Education that favors active participation and collaboration in the formal, non-formal and informal areas of education. On the contrary, the absence of changes in the control group strengthens the hypothesis that the observed improvements are due to the structured intervention. This fact is particularly relevant, since inclusion cannot be considered exclusively as physical presence or formal participation, but as a relational process and subjective experience, which is built through meaningful and continuous interactions over time. This underlines the effectiveness of the Outdoor Education program on bocce compared to the activity carried out indoors. Therefore, bocce in turn, favored the process of inclusion and active participation of participants, including those with Special Educational Needs as it is a highly accessible sport, the rules are adaptable to any type of disability without altering the sense of the game and the benefits deriving from it. These elements are consistent with what has been highlighted by studies on adapted and inclusive sport, which recognize the value of accessible motor activities in promoting equity and participation (Brittain et al., 2023; Fitzgerald, 2018). This discipline is managed in Italy by the Italian Bocce Federation

(FIB) which actively collaborates with local schools through educational projects and training collaborations. This bridge, therefore, has favored the choice of the discipline for study, as it is an activity that can be practiced both in formal, non-formal and informal contexts and also favors intergenerational dialogue. Therefore, the proposed program of activities is fully in line with the paradigm of Learning Cities in which learning takes place throughout life in multiple contexts and enhances the urban space as an extended and inclusive educational environment. Finally, the objective of the study was achieved by demonstrating how Outdoor Education through a structured bocce program can promote inclusion in a Learning City. However, the study has some limitations, including sample size and limited duration of surgery. Overall, the results support the hypothesis that Outdoor Education, with adapted and accessible sports, in Learning Cities can contribute to the development of more equitable, participatory and well-being-oriented urban contexts.

5. Conclusions

The present study has highlighted how an Outdoor Education intervention based on the game of bocce can represent an effective strategy for the promotion of social inclusion in urban contexts. In particular, the quantitative results, supported by the structured observations, as reported, show a significant improvement in the levels of participation, collaboration and positive peer interaction in the experimental group compared to the control group. The use of bocce has proven to be particularly appropriate as an accessible and adaptable sport, capable of enhancing different abilities and encouraging the active participation of children with and without Special Educational Needs. The Outdoor environment has also contributed to creating a stimulating educational context, promoting positive relational dynamics and a greater sense of belonging to the group. In line with the perspective of extended learning, the learning process is not confined to the classroom but develops through the interaction between individuals, the body, the environment and the social context, extending educational experiences into the territory. Included in the framework of Learning Cities, the study underlines the central role of the territory as a widespread educational space, in which collaboration between schools, sports federations and the local community can generate opportunities for inclusive and sustainable learning. In this perspective, outdoor sport is configured not only as a motor activity, but as an educational and social tool capable of contributing to the development of more inclusive and participatory cities.

In conclusion, the proposed experience supports the adoption of educational practices that enhance outdoor sport as a lever for inclusion and social well-being, contributing in a concrete way to the construction of open, accessible educational contexts consistent with the principles of Learning Cities.

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