

FACILITATING PLAY DIVERSITY IN PRIMARY SCHOOL OUTDOOR SPACES

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ABSTRACT

Playing outdoors at school provides children with opportunities to understand and engage with their spatial surroundings, shaping their cognitive awareness of the school environment. In Indonesian public elementary schools, outdoor areas are expected to support both educational and recreational functions; however, their actual use during recess remains underexplored. This study investigated how children used outdoor school spaces for play during recess at SDN Gondolayu, Yogyakarta, using place-centered behavior mapping complemented by a children's perception survey. From 172 observed activity groups, non-play activities constituted the largest proportion of recess use, followed by restorative play, indicating limited engagement in active play. Boys used outdoor spaces more frequently than girls and showed different play tendencies, while age differences between lower (Grades 1–3) and upper (Grades 4–6) groups were minor. Spatial analysis revealed that children predominantly occupied corridors, edges, and other in-between areas that were flexible and loosely programmed rather than formal courts. Survey responses further indicated higher enjoyment in socially interactive and expressive forms of play. The predominance of non-play activities across locations suggests that several parts of the school environment were unable to support diverse play opportunities. In the absence of dedicated playgrounds and varied environmental features, children used transitional and semi-enclosed spaces that offered enclosure, proximity to peers, and opportunities for engagement. These settings enabled both refuge and social interaction within the same spatial field, indicating that children's play experiences were shaped by the combined spatial qualities of school environments rather than by isolated features or equipment alone. These findings highlight how the spatial characteristics of school environments shape children's play behavior and experiences. Understanding children's interactions with informal and transitional outdoor settings can inform schoolyard design strategies that support more diverse and engaging play opportunities in primary school settings.

Keywords: Outdoor Play, Recess Play, Primary Children, Outdoor School Environment

INTRODUCTION

Play is a fundamental need for children and should be done in an independent, fun, flexible, and positive way (Lester and Russell, 2008; Pellegrini *et al.*, 2007; Tadkiroatun, 2015). Children can participate in play wherever they perceive it as a play space (Glenn *et al.*, 2013), including at the community level, as well as in school areas that are frequently used during recess. Recess time in a school's outdoor environment offers numerous advantages for the growth of children in both physical (Hyndman *et al.*, 2013; Tercedor *et al.*, 2019) and social-emotional aspects (Fromberg and Bergen, 2006; Loebach and Cox, 2020). Creating a good outdoor play space, particularly in a school setting, can increase children's motivation to attend school and enhance their academic performance (Hyndman *et al.*, 2012; Noll *et al.*, 2022).

Research has shown that children may use outdoor environments to play differently. The design of the play area is one of the factors that affect their play behavior and preferences (Czalczynska-Podolska, 2014). For example, outdoor areas are mainly preferable for physical play (Escalante *et al.*, 2014) compared to indoor ones. It is in line with the preferences of children aged 6-11, who enjoy more challenging play activities (Jansson, 2015). Children are generally more active in schools that offer permanent amenities such as sports facilities, recreational spaces, diverse surfaces, and greenery (Delidou *et al.*, 2016).

Outdoor activities not only enhance learning experiences but also promote social interactions among children, including those with disabilities. School outdoor environments play a significant role as an exploration medium for various play methods. It needs to prioritize inclusive concepts for children, the primary users of the play space to ensure that children of all ages, abilities, and backgrounds have equal access to play and social interactions (Wenger *et al.*, 2023). When a playground is designed to be inclusive, it can help to create an environment that could enhance inclusive play where everyone can play together regardless of their abilities (Casey, 2005). Ultimately, creating such environments can significantly impact children's growth and preferences in adulthood (Sisan and Kusuma, 2025).

In Indonesia, public elementary schools often lack sufficient playground infrastructure to explore various types of play environments. It typically offers limited play facilities, with most of the focus on sports activities. Unfortunately, many existing playgrounds do not offer a sufficient range of diverse and engaging play opportunities. The lack of inclusivity aspects could accidentally create negative impacts such as marginalization and exclusivity of the play space (Moore *et al.*, 2022).

The limited range of play options available can hinder the experiences of children with different needs, making it difficult to create truly inclusive spaces where everyone can thrive and have fun together. To foster inclusivity, it's essential to integrate a wide variety of play approaches that encourage creativity and engagement for all children, no matter their abilities. Additionally, having an inclusive play environment where every child feels welcome (Corcoran *et al.*, 2015) is vital for establishing a more child-friendly school atmosphere in the community.

Gender also plays a role in shaping children's use of school playgrounds. Boys often dominate larger open spaces with ball games and physical activities (Massey *et al.*, 2018), while girls tend to occupy smaller or more peripheral areas for social and imaginative play. This spatial division is influenced not only by preferences but also by limitations in available play facilities. When playgrounds lack diversity, opportunities for girls' participation are often reduced, leading to unequal experiences of play (Saragih and Subroto, 2023). Boys' games are usually competitive and hierarchical, while girls' play tends to be more inclusive and collaborative (Almonacid-Fierro *et al.*, 2022).

While research on children's play and school outdoor environment is expanding, there appears to be a gap in empirical studies that explore how children navigate outdoor school spaces during recess from spatial and behavioral perspectives, especially in the context of Indonesian public elementary schools. In particular, there is a notable lack of observational evidence that connects patterns of space usage, play behaviors, and gender differences to the spatial characteristics of school outdoor environments.

This study aims to explore how children utilize outdoor areas in public elementary schools during recess, focusing on patterns of space use, play behavior, and inclusivity. Research conducted at SDN Gondolayu, Yogyakarta, using a place-centered behavior mapping method to observe spatial distribution, group behavior, and gender differences. By analyzing how children use spaces, it seeks to understand how outdoor school environments can support diverse and inclusive play experiences.

THEORY / RESEARCH METHODS

Study Area

The study was conducted in SDN Gondolayu, located in Jetis, Yogyakarta. The selection of the school for the study area is based on the limited playground facilities available in the school (Figure 1). This limitation has led to more flexible outdoor spaces, as children have to be creative and develop a variety of play activities. Limited formal play equipment offers a unique opportunity to explore how children creatively adapt available spaces for different types of play.

This study explored both semi-outdoor and outdoor areas based on pre-research that discovered a variety of play and close activities. The primary focus of this research is to understand the type of play activities that children engage in during recess time and the characteristics of the spatial environment that support the activities.

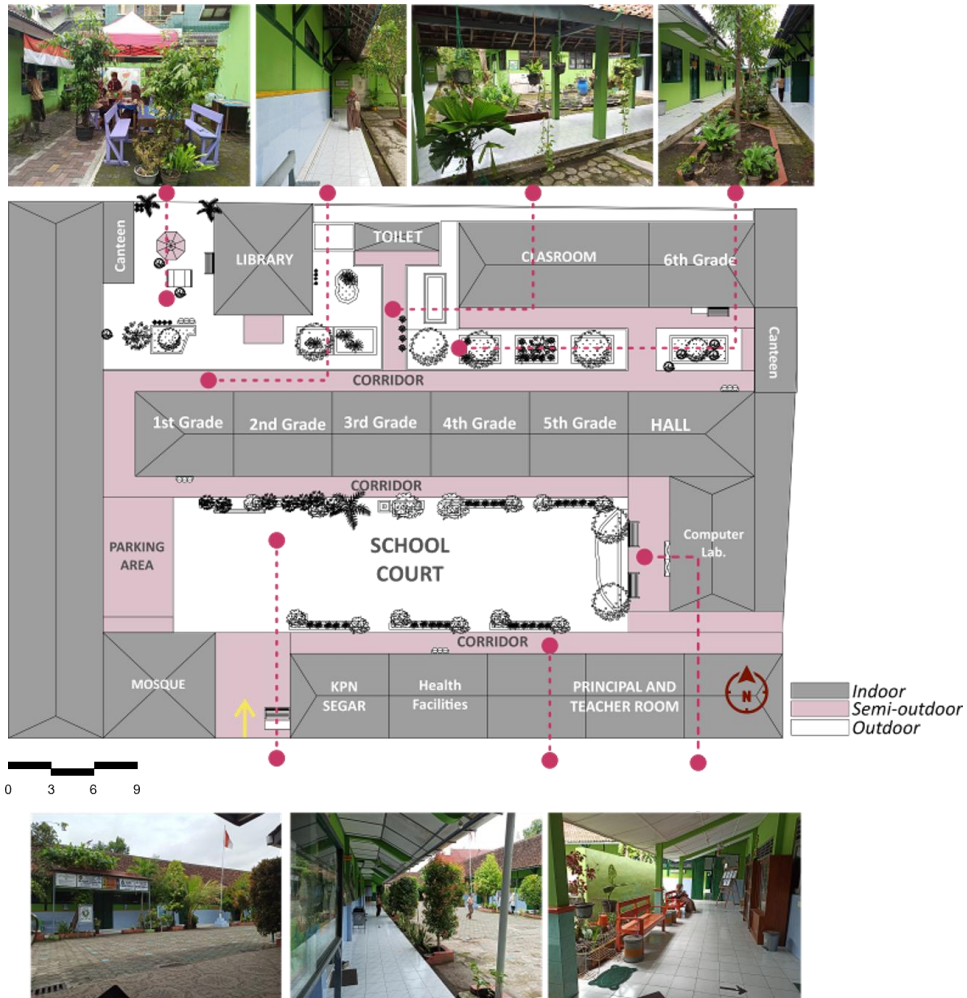


Figure 1. School Basemap

Data Collection

Research data were collected through two complementary methods: behavior mapping, which documented the children’s activities and movement across different school spaces, and a perception-based questionnaire, which captured the children’s own views and experiences of their play environment.

Behavior Mapping

Behavior mapping techniques were employed to examine play activities across different age groups and genders, as well as their relationship to spatial characteristics of the school environment. A place-centered behavior mapping method was used to observe and record these activities during a 15-minute recess period. Observations were made through simultaneous manual notetaking and video

recording to enhance accuracy and reliability, while the researcher minimized direct interaction with the children to maintain the natural flow of activities.

Play activities were classified using the Tools for Observing Play Outdoors (TOPO), developed by Loebach and Cox (Loebach and Cox, 2020). TOPO categorizes recess play in nine types: physical play, exploratory play, imaginative play, play with rules, expressive play, digital play, bio play, restorative play, and non-play. Digital play was excluded due to school policy that prohibits the use of gadgets during school hours. The resulting data were analyzed to explain how the spatial characteristics were used by children in their playtime.

The observation was conducted during a single recess session, which may limit the robustness and generalizability of the findings. Play behavior can differ based on various factors, including daily variations, weather conditions, and school routines. Therefore, the results should be considered a contextual snapshot of children's play behavior rather than representative of all recess activities over time. In terms of observer reliability, all observations were conducted by the same researcher following a standardized observation protocol and using predefined play typologies to maintain consistency in data recording and interpretation. Video recordings were reviewed during the analysis phase to verify observational notes and minimize potential observer bias.

Children's Perception Survey (LEAP Questionnaire)

To complement behavioral data, a structured questionnaire adapted from the LEAP framework (Landscape and Environmental Assessment for Play) (Hyndman *et al.*, 2013) framework was distributed to 28 students. This tool captured children's enjoyment levels (on a scale of 1-5) in various play types (e.g., physical, exploratory, imaginative). The questionnaire results were used to provide information on the subjective experience and preferences of the children within the observed play environment. The perception survey served as a form of data triangulation, allowing behavioral patterns observed during recess to be compared with children's reported preferences and experiences of the play environment. This approach helped strengthen the validity of the findings by integrating objective observation with subjective user perspectives.

The study identified a total of 172 group activities that involved 375 children. These activities were scattered throughout the school, and each had its unique environmental characteristics. Details of these activities will be elaborated in the next section of the research.

RESULTS AND DISCUSSION

General Findings

Table 1. Play Activity

No	Play Type	Activity (%)
1	Physical Play	13.37
2	Exploratory Play	12.79

No	Play Type	Activity (%)
3	Imaginative Play	1.74
4	Play With Rules	8.72
5	Bio Play	1.16
6	Expressive Play	18.60
7	Restorative Play	18.60
8	Non-Play	25.00

Table 1 shows that non-play activities accounted for the largest proportion (25%), including eating and self-care. Among the types of play, restorative play (18.60%) and expressive play (18.60%) were the most frequently observed, while bio play (1.16%) and imaginative play (1.74%) were the least. Non-play also included occasional aggression and transition behaviors, but nutrition-related activities were dominant. These findings highlight that while children actively participate in play, a significant portion of recess is also spent in activities outside of formal play categories.

The results of the LEAP questionnaire (see Table 2) provide additional insight into the subjective experiences. The intrapersonal section shows an overall mean score of 3.62, suggesting that children generally perceive outdoor recess positively but with variation between play types. The highest scores appear in Play Activity (4.29), Restorative Play (4.14), and Imaginative Play (4.04), indicating children's appreciation for engagement, relaxation, and creativity. In contrast, lower averages in exploratory play (2.93) and expressive play (3.14) suggest that the schoolyard may not fully support discovery-based activities or expressive outlets. Mid-range scores in physical play (3.45) and Bio Play (3.54) point to moderate support for active and nature-based play, while a relatively lower score for game switching (3.71) hints that playground design or rules may limit smooth transitions between play types.

Table 2. Intrapersonal Section of LEAP Questionnaire

No	Dimension	Mean (1-5)
1	Play Activity	4.29
2	Game Switching	3.71
3	Physical Play	3.45
4	Exploratory Play	2.93
5	Imaginative Play	4.04
6	Play With Rules	3.32
7	Bio Play	3.54
8	Expressive Play	3.14
9	Restorative Play	4.14
Overall		3.62

The prominence of leisure-oriented play has both opportunities and challenges. Although relatively low levels of physical play can reduce children's active participation of children, these quieter forms of play can contribute to independence, language development, and stress reduction (Kory-Westlund and Breazeal, 2019; Roberts *et al.*, 2020). However, low scores in exploratory and bio-

play highlight a missed opportunity for nature-based and discovery-driven experiences, which are often linked to creativity and environmental awareness. Additionally, Recess should ideally foster more diverse play opportunities, balancing restorative and expressive activities with more physically active and exploratory experiences (Wenger *et al.*, 2023).

In contrast, the relatively low observation rates for bioplay (1.16%) and imaginative play (1.74%) contrast with the higher LEAP ratings for imaginative play (4.04). This discrepancy suggests that, although children value opportunities for creative and imaginative engagement, the schoolyard offers limited resources to support such activities. Similarly, the modest ratings for exploratory play (2.93) point to constraints in the environment's capacity to encourage discovery-oriented behaviors. Together, these findings highlight the need for schoolyard designs that better accommodate diverse and active play experiences, rather than predominantly passive or restorative engagements.

Table 3. Play Activity Related to Gender and Age

Play Type	Percentage of person (%)	Gender (%)		Age Group (%)	
		Boys	Girls	Younger Age (1-3)	Older Age (4-6)
Physical Play	12.53	8.27	4.27	5.07	7.73
Exploratory Play	11.47	5.87	5.60	7.47	4.00
Imaginative Play	1.33	0.80	0.53	0.80	0.53
Play With Rules	18.40	12.80	5.60	9.07	9.33
Bio-play	0.80	0.27	0.53	0.80	0.00
Expressive Play	18.67	6.40	12.27	5.07	13.60
Restorative Play	13.33	6.67	6.67	7.73	5.60
Non-play	23.47	20.53	2.93	8.27	14.93
Total		61.60	38.40	44.27	55.73

According to the general results in Table 3, boys (61.60%) tend to play outdoors more than girls (38.40%). This finding supports previous research that suggests that boys are more likely to participate in physical play and dominate outdoor play compared to girls (Pawlowski *et al.*, 2018; Tercedor *et al.*, 2019), considering the tendency of girls to stay in their classroom during recess (Pawlowski *et al.*, 2018). Besides boys, who are predominantly engaged in non-play activities (20.53%), they tend to engage more in play with rules (12.80%). Play with rules includes physical and sports games such as football, *kasti* (Indonesian bat-and-ball team game), and *donal bebek* (a traditional Javanese chain game involving backward stepping and foot-touching), which are categorized as folk games. It could be concluded that boys mostly participate at sports activities in school (Massey *et al.*, 2018).

Girls play in the outdoor environment mainly for expressive play (12.27%) followed by restorative play (6.67%). It aligns with research findings that indicate that girls are more prone to participate in social play and group activities on a

playground (Snow *et al.*, 2019), with social interaction being the most common theme related to their ideal playground idea. This difference between playground behaviors is not only about individual preferences but also about how the playground environment is organized socially and spatially organized. Previous studies show that boys often occupy central and open spaces with competitive games, while girls are pushed to the periphery for social or imaginative play (Saragih and Subroto, 2023). Similarly, research highlights that school recess often reproduces gender roles: Boys' games are more competitive and hierarchical, while girls' games are more inclusive and cooperative (Almonacid-Fierro *et al.*, 2022). This suggests that playground dynamics are shaped both by the availability of space and by broader sociocultural expectations, which together reinforce unequal opportunities for boys and girls during recess.

The results of age groups show a gap between the older group of children (grades 4-6) and the younger one (grade 1-3). Younger children (44.2%) tend to play more in exploratory play and restorative play while older children (55.73%) mostly spend their recess time in expressive and non-play. Based on this result, older children tend to be more active in conversation and social interaction with their peers (Sabani, 2019).

Play Type Relate to Spatial Characteristic

Each play category demonstrated distinct spatial characteristics and environmental associations that shaped how activities were performed (see Figure 2). Physical play, such as rough-and-tumble games, frequently occurred in corridors rather than on the open school court, indicating that circulation spaces were appropriated to support movement-based activities. Exploratory play showed a similar tendency, concentrating in corridor zones where architectural elements such as doors, walls, and small spatial features could be manipulated as objects of engagement.

Play-with-rules activities, including games such as hide-and-seek, extended beyond open courts into semi-enclosed settings that offered opportunities for concealment and spatial subdivision. Bioplay was likewise observed in relatively enclosed rear areas where vegetation and environmental features were available. Expressive play followed a comparable spatial pattern, occurring in socially comfortable zones that allowed small-group interaction without interference from large-scale physical games. Restorative play, although lower in physical intensity, was commonly located in shaded areas adjacent to active play zones, enabling children to rest while maintaining visual connection with peers' activities (see Figure 3).

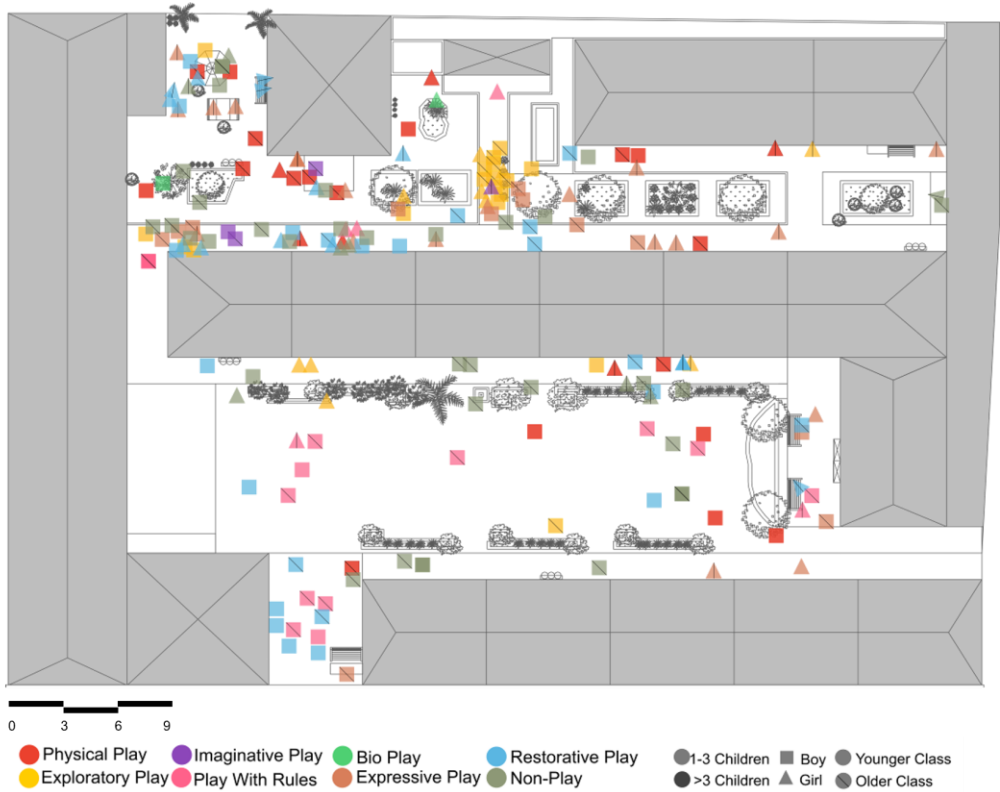


Figure 2. Behavior Mapping of The Play Activities



Figure 3. Play Along the Edges: Children Playing Ball with Peers Watching Nearby (Left) and Hand-Clapping Games (Right)

Taken together, these observations indicate that while each play type corresponded to particular environmental features and functional needs, a consistent spatial tendency emerged across categories. Children predominantly selected enclosed, shaded, and spatially defined areas rather than exposed open courts. This pattern suggests that, despite functional differences between play types, children’s

spatial preference during recess is strongly oriented toward settings that provide boundary, comfort, and social observability.

This preference highlights the importance of transitional and semi-enclosed environments in children's play activity. The spaces most frequently used by children, such as corridors, can be understood as in-between or peripheral spaces: small, spatially defined settings located along building edges and between larger formal areas (Aminpour *et al.*, 2020). These settings provide partial enclosure, shade, and proximity to classrooms, creating conditions that children perceive as flexible and secure. Previous studies indicate that such semi-defined environments offer clear spatial boundaries for small-scale, self-directed play while maintaining visual links to surrounding activities, allowing children to observe peers without being fully exposed (Aminpour, 2022). This spatial quality supports children's psychosocial needs for comfort, agency, and social awareness during recess (Abu Ghunmi, 2024; Sheikh Asadi and Hojat, 2020). Consistent with this interpretation, play activities in the observed school tended to cluster near indoor interfaces rather than in exposed central zones. As noted, children's spatial use is strongly influenced by the relative position and flexibility of surfaces and layouts (Bobby Saragih, 2021). Semi-closed corridors or loosely programmed lobbies are more easily used for diverse activities than rigid, fixed outdoor courts.

In contrast, the main court accommodated a comparatively narrow range of activities, predominantly play-with-rules games requiring expansive, unobstructed surfaces (see Figure 4). Its highly exposed and single-purpose configuration supports predetermined, movement-intensive play patterns while offering limited opportunities for enclosure, spatial subdivision, or environmental manipulation. Unlike peripheral or semi-natural settings, the court lacks loose or moveable materials that children can rearrange, combine, or transform to construct their own play scenarios. Research on loose parts environments indicates that access to flexible, manipulable elements enables children to develop more complex social, cognitive, and imaginative play sequences (Cetken-Aktas and Sevimli-Celik, 2023). This condition may also contribute to children's tendency to withdraw toward peripheral spaces as a passive strategy to avoid conflict (Aminpour *et al.*, 2020), overcrowding, and the dominance of physically intensive ball games. Consequently, compared with transitional settings, the spatial affordances of the main court appear less adaptable for diverse, self-directed, and socially nuanced play.

In addition to the constraints of the court surface, the overall scarcity of ecological elements within the school grounds further limited play diversity. Earlier studies indicate that vegetation supports children's constructive play, socio-dramatic play, and physical play (Aminpour, 2021). However, the findings indicate that there are not many green elements that play a role in their play process. Children who spend most of their time playing in the hallway tend not to engage significantly with the natural features found in the outdoor area. This may explain the limited number of participants for the bio-play activities.



Figure 4. The Differences in Spatial Context of Play: Hide and Seek in an Enclosed Area (Left) and *Donal Bebek* in Open Court (Right)

These environmental gaps point to the need for targeted spatial and ecological improvements to support underrepresented play types. It is important to give special consideration to activities that have a limited number of participants, as they require improvement. Collaborative play can be encouraged by investing more in natural settings than manufactured ones (Raney *et al.*, 2019). Considering placing green environments in playgrounds could help improve children's physical play (Mårtensson *et al.*, 2014) and sense of balance (Loebach and Cox, 2022). For instance, to encourage more exploration of natural settings in bio play, outdoor spaces can be improved to facilitate engagement with the natural environment better.

Overall, the findings indicate that several areas within the school environment were unable to support a diverse range of play activities, as reflected in the predominance of non-play activities across locations. It is difficult for public schools without a designated playground area and diverse environmental opportunities to offer a diverse range of play options for children. The outdoor environment should provide children with space that can be utilized in various ways, including playground equipment and other facilities to support a diverse range of play opportunities for children during recess. Basic improvements can be made to encourage more varied play activities, such as equipping outdoor spaces with appropriate play equipment is one way to promote physical activity (Wenger *et al.*, 2023), while providing a variety of spaces in a playground may contribute to creating inclusive environments (Casey, 2005; Dalpra, 2022).

Moreover, emphasizing the creation of nature-based, open-ended environments where children actively participate in the design and management of

the space can be crucial in promoting diversity in play experiences (Lynch and Wishart, 2022). This participatory approach allows children to express their creativity and agency, ultimately leading to more dynamic and enriching play environments that cater to a wide range of preferences and needs. The variety of play equipment available allows children to explore a broader range of play opportunities, enhancing their overall experience, to create spatial security and belonging (Dyment and O'Connell, 2013)

These findings suggest that children's emotional and behavioral responses were shaped not by isolated spatial features but by how multiple spatial qualities were experienced together during play (Lin *et al.*, 2025). The clustering of diverse play categories in corridors and semi-enclosed areas indicates that children actively sought spatial conditions offering enclosure, proximity to peers, and opportunities for engagement. Even within fragmented or minimally equipped environments, transitional school spaces were appropriated as usable play settings that enabled both refuge and social connection, supporting movement-based, social, and restorative activities within the same spatial field. This pattern can be understood as children seeking and constructing affordances within the existing spatial structure of the school environment, as play settings that allow self-directed engagement with space have been associated with greater familiarity and confidence in place (Canning, 2022)

Children's sense of place thus contributes both to present well-being and to the long-term formation of environmental identity (Rieh, 2020). Studies on environmental preference further indicate that emotionally meaningful environments support both individual and group play, strengthening social cohesion and place attachment, which in turn fosters more diverse play experiences (Khosrowjerdi and Noshadi, 2025). This reinforces the architectural understanding that spatial intimacy emerges from the interplay of environmental structure, material qualities, and opportunities for appropriation rather than from isolated design elements.

CONCLUSIONS

Based on the results of the study, it has been found that non-play dominated recess time outdoor play activities were followed by restorative play and expressive play. This implies that children tend to engage in activities that are less physically demanding, such as socializing and talking with friends during recess. This is an interesting finding as it sheds light on the importance of socializing and communication in children's lives.

Another notable finding of the study is that boys tend to be more active in outdoor play activities than girls. However, the age group shows only a slight difference in preferences. Each gender and age group tends to dominate certain play types, which is related to their preferences and self-development characteristics. The school's outdoor environment is essential in supporting children's recess play, yet the prevalence of non-play activities shows limited opportunities for active play. Missing are flexible spaces such as open areas for movement, shaded corners for social play, and natural areas for exploration. Future studies could include brief

student interviews to identify what spaces they feel are lacking, ensuring that added play areas truly reflect children's needs.

From an architectural standpoint, the dominance of non-play activities and restricted active play indicates limitations in the spatial characteristics of the school's outdoor setting. The lack of versatile open spaces, shaded or partially enclosed areas, and elements related to nature limits the diversity of play options accessible to children. These insights emphasize the necessity for schoolyard designs that go beyond simple-purpose courts by integrating a variety of spatial types, such as transitional spaces, flexible zones, and nature-rich areas that can accommodate multiple types of play. This kind of play space functioned not merely as circulation or residual areas but as emotionally legible play settings where enclosure, proximity, and spatial definition fostered security and belonging

For school authorities and architects, the research highlights the significance of viewing everyday outdoor and circulation areas as potential spaces for play. Design methods that emphasize spatial versatility, suitable scale, varying degrees of enclosure, and closeness to classrooms may better accommodate different play activities during recess. Architectural enhancements like shaded walkways, diverse surface types, and the incorporation of natural features, instead of depending solely on traditional playground equipment, can improve children's interaction with outdoor environments.

It is crucial to recognize that the findings presented in this study may not apply to other public elementary schools with varying architectural designs and characteristics. Consequently, additional research is needed to analyze play experiences in schools that possess different architectural features and demographic profiles. Future studies could focus on examining children's perceptions of spatial affordances more directly across various school environments. Comparative research involving schools with different spatial layouts, ecological components, and levels of enclosure could help clarify the impact of architectural design on the diversity of children's play and their spatial preferences. This could ultimately aid in creating architectural design guidelines for schoolyards that more effectively address children's behavioral and emotional needs during play.

ACKNOWLEDGMENT

This article is derived from a broader series of research conducted as part of the author's graduate thesis. The present paper represents a substantially re-framed and selective use of the original research, focusing only on a limited subset of the empirical dataset relevant to children's play types and spatial characteristics. While the thesis included a wider analytical scope, the discussion in this article has been newly developed and tailored to the specific architectural focus of this publication. The reference framework has also been expanded and adapted to align with this particular research strand.

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