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Exploring Children's Connections to Nature Through Photovoice in School Environments

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ABSTRACT

Schools play a pivotal role in shaping the formative experiences of children, influencing their academic and social development. It is crucial to understand the subjective perceptions of students regarding school spaces allocated or designed for them to know the significance of these spaces and how they are utilized. The primary aim of this study is to explore elements within the school-built environment that foster children's connection to nature using the innovative photovoice method. Guided by the question, "How does the photovoice method enhance our understanding of children's connection to nature, fostering both ecological sensitivity and equitable experiences within the school setting?" The students were briefed to shoot pictures of their 10 favourite places in the school premises and then participate in individual interviews. The results showcased a number of nuanced ways in which children connected with nature, emphasizing the ecological richness of the school environment. This research listens to children's voices through the visual narrative of photovoice. It aims to inform future educational practices and environmental design strategies, emphasizing the dual goals of equity and ecological sustainability within school environments. This study enriches the current literature by employing photovoice as a method to explore school connectedness and identify elements fostering connection in the school environment. Notably, participants emphasized that experiences in the natural environment, facilitated through outdoor activities and observation, significantly contribute to an enhanced sense of school connection. To conclude, understanding and fostering nature connectedness in children within the school environment is a crucial aspect of providing quality education. The study's emphasis on ecological sensitivity and aligns with the broader goals of environmental sustainability, contributing to both SDG 4 and SDG 15.

1. Introduction

The United Nations (UN) Sustainable Development Goal-4 states- "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". Providing high-quality education is the first step towards sustainable growth that promote just and supportive societies. The foundation for lifelong learning and human development starts with the early childhood education. By 2023,the aim is to ensure that every student has the knowledge and skills needed to support sustainable development and lifestyles, that contribute towards global sustainability goals.

Research studies have indicated a concerning decline in children's environmental awareness due to their reduced experiences and engagement in natural spaces (Adams & Savahl, 2017).Researchers are increasingly concerned with understanding the widening gap between humans and nature. The term "nature deficit" was coined by Richard Louv (2005) in his book Last Child in the Woods to describe the increasing disconnection that children and adolescents have with the natural world (Todt, 2006) . To reconnect with nature, we need more than just changing our cultural mindset. It involves developing a deep awareness that aligns with the natural processes that have shaped human existence for thousands of years (Zylstra et al., 2014).

Schools are one of the most important formative institutions for children, where they spend a significant amount of time learning and developing various skills(Indira Dutt, 2012). Schools are diverse spaces that accommodate students of varying ages, interests, and abilities (Collins & Coleman, 2008). These are educational establishments that aim to provide a nurturing and educational environment for children through well-designed learning environments, both indoors and outdoors to promote academic success and support individual student growth (Shamsuddin et al., 2012). The various spaces within a school, which include the indoor spaces (ex. classrooms, laboratories, library etc.), outdoor spaces (playgrounds, courtyard, gardens etc.) and the transitional spaces (ex. corridors, atrium, hallways, entryways etc), that serve various functions evoke different meanings to students. These spaces offer opportunities for learning, collaboration, physical activity, socialization, and community building, ultimately shaping students' experiences and perceptions of their educational environment (Rigolon & Alloway, 2011). The physical school environment represents the territories and power either help students feel like they belong or make them feel alienated.(Joyce, 2018).

However, the school design has predominantly been focused on the designated areas for structured learning activities, overlooking the significance of other spaces within school facilities (Kasali & Doğan, 2010a). A substantial number of children's non-class time is spent on the school grounds. These activities on school grounds provide children with opportunities for physical exercise, relaxation, and enjoyment, all of which can improve their motivation, mood, and overall mental health. The events and interactions that occur on the schoolgrounds can have a potential impact on all aspects of school life (Wyra & Lawson, 2008). These playgrounds though typically designed and constructed by adults, children who are innate explorers having their own concepts dictate their usage and activities experiencing the environment with all their senses and feelings (Brunnberg, 2005). Architecture does impact people which often goes unnoticed. People may not understand why certain buildings or rooms affect them, or how they feel in different environments. Similarly, the influence of school surroundings on children's minds is often underestimated (Khan & Kotharkar, 2012). Considering the significant time children spend in schools, their unique needs necessitate dedicated spaces for the activities they perform. These dedicated spaces extend beyond the traditional learning areas of classrooms, libraries, and corridors to encompass the outdoors, incorporating playgrounds and play areas. However, simply providing these spaces isn't enough. To optimize their impact, we need to understand how children perceive these environments.

Feeling of connectedness towards school is important for the holistic development of students, encompassing their sense of belonging and engagement within the school community. This includes their attitudes towards school and relationships with peers, teachers, and staff (Joyce, 2018). This connectedness is an emotional bond highlighting the multifaceted nature of the relationship between

individuals and their significant places (Najafi & S, 2012).Therefore, it's crucial for schools to nurture a welcoming and cohesive school atmosphere that encourages positive connections and enriching experiences throughout every aspect of the school built environment. In order to understand the meanings that children assign to their interactions with nature and how these interactions affect their subjective well-being, research involving children is necessary to investigate their subjective interpretations, perceptions, and experiences of natural environments (Adams et al., 2017).
Traditional research methods, which rely primarily on adult observations or questionnaires, may fail to capture the complexities of children's experiences, particularly among younger children. This is when photovoice, an effective research tool, comes into play. Photovoice, a research method that combines photography and participant narratives, allows participants to express themselves visually. This strategy, which is especially appropriate for children who struggle with verbal communication, allows them to document their educational experiences and opinions through images. Taking this as a base for exploring this study investigated how children in grades 6–12 at a school in the Udupi district of Karnataka, India, use photovoice to express and explain the meanings they identify with various areas in their school environment.

The main goal of the research is to investigate how photovoice may be used to to examine the elements of the school environment that influence students' feelings of connection and disconnection from their school. By going beyond traditional surveys, it may be possible to confirm the known components of connection and uncover new aspects of school connectedness (Joyce, 2018). Little information is available about the interactions between children and the school-built environment that take place in the school premises. this study adds to the body of current work, by employing photovoice as a tool to investigate the role of the school-built environment towards children's natural connectedness and to identify the aspects of the school environment that promote connection, this study adds to the body of current work. By presenting a thorough case study, it delves deeper into the possibilities of photovoice as a tool to investigate the built environment of a school and the components within that environment that promote connection in a school.

1.1. Literature Review

(a)Concept of Nature Connection

In the fields of environmental education and environmental psychology literature, the relationship between man and nature is explored and documented in many ways. This relationship between humans and nature has been explained through the three interrelated key aspects (Ernst & Theimer, 2011)

Affective - our feelings and emotions towards nature

Behavioural - our experiences and actions in nature

Cognitive - our knowledge and beliefs about nature

And therefore, we can say that- Nature connectedness encompasses various dimensions of an individual's connection with nature, including emotional, behavioral and cognitive, aspects. Nature connectedness refers to the depth of children's emotional bond to the natural world (Sobko et al., 2018), which encompasses the integration of nature into one's identity and understanding of its intricacies(Schultz, 2002)(Nisbet et al., 2009). It is a multi-dimensional attribute that includes an individual's subjective experience of their relationship with nature that goes beyond the physical presence (Martin et al., 2020) which is necessary for engaging in ecological behaviours (Frantz & Mayer, 2014). This connection to nature varies from aesthetic appreciation to a deep sense of belonging (Caulkins et al., 2006).It can be nurtured through contact and experiences and act as intrinsic motivator for adopting eco-friendly lifestyles (Otto & Pensini, 2017).

Access to nature provides invaluable advantages to children in many facets of their lives. According to research, exposing children to nature in their homes, schools, and communities promotes their physical, mental, and cognitive development (Chawla, 2020). Understanding the perceptions of

children and their relationship with nature is crucial to fully comprehend the positive effects it can have on their overall health and well-being (Arola et al., 2023).

(b)School Environment and Nature Connection

Schools have the potential to promote the emotional, physical, cognitive, linguistic, including the social and spiritual development which are the aspects of child development and growth (Davies et al., 2013). The school environment significantly impacts children's physical activity levels (Grunseit et al., 2020), a significant factor in children's social, intellectual, and cognitive development contributing to their overall development. It is important that every space designed in the school premises be considered as a contributor to learning (Kasali & Doğan, 2010b). The school buildings are typically built and structured to prioritize the time table and the curriculum to mould the behaviour of its inhabitants often focusing on quantitative analysis, to establish correlations between students' academic performance and the school infrastructure, overlooking the qualitative insights provided by students and teachers regarding their experiences within the learning environment. (Gordon Masi, 2018).

(c)Photovoice Methodology

Visual methods are widely used in qualitative research, which provide an in-depth understanding of participants' lived experiences, everyday realities, values, and norms (Samonova et al., 2022).Photovoice a visual method combines arts-based and qualitative research methods with participatory features (Bromfield & Capous-Desyllas, 2017). It uses photography as a tool which empowers participants to document the strengths and opportunities within their environments. Participants capture their own experiences and perspectives, shaping their own narratives for communication (Monteblanco & Moya, 2021).It has been demonstrated that the act of narrating photographs encourages people to reflect on and comprehend themselves (Bromfield & Capous-Desyllas, 2017).Ethical considerations, such as photo-taking and research findings dissemination, are paramount in photovoice methodology (Nyika, 2022). It is an important tool for understanding how children experience and perceive their surroundings, which also includes their social interactions within those spaces (Jørgensen & Allan, 2022).

In this study, Photovoice provided a unique chance to directly engage children in documenting and expressing their perceptions of their school environments, including the variables that contribute to their sense of connection and possibilities to explore.

2.Methodology

The study is conducted in the school category Primary with Up Primary secondary and Higher Secondary (Classes from 1-12) ranging from 11yrs to 18yrs age. Children develop values towards nature between three and six years of age. The Middle childhood (ages 6-12) is a time when children become more calm, aware, and appreciative of creatures and natural settings, often close to home. They begin to distinguish the "different-ness and other-ness" of the surrounding environment, fostering affection and curiosity for other living things and places(Shepard, 1982). Exploring unfamiliar natural settings expands their knowledge, sense of competency, and ability to handle new environments independently. Along with this growing awareness the children also acquire a sense of responsibility to protect the natural world. This period is crucial for fostering cognitive and intellectual growth, with many critical thinking and problem-solving skills honed through interaction with nature. The 11-18 age group (early adolescence to late adolescence) This age group experiences a growing desire for independence and identity exploration. Their cognitive development leads to a heightened awareness of environmental issues leading to a sense of responsibility for the environment (Chawla, 2020).

2.1.*Ethical Considerations*

The study adhered to the core ethics principles very strictly. Ethical clearance to conduct the study was obtained from the KMC and KH Institutional Ethics Committee,MAHE,Manipal.The total sample consisted of 10 children between the ages of 11 and 18, from one school in Udupi district. Although it was intended to include an equal sample of boys and girls from each school, this was not achievable because participation was voluntary. The children from grade 6 to grade 12 were nominated by their class teachers. Permission to conduct the study was obtained from both the school principal and the parents of participating children.

2.2: *Procedure*

Photovoice usually consists of three steps: (1) shooting photos, (2) talking about photos, and (3) transcribing. The participating children were given instructions on the primary goal of this activity before any images could be taken.

The children were asked to take maximum of 10 photos of their favorite places in their school in ten minutes. Because there was a limit on the quantity of images children were able to concentrate on the primary items they wanted to communicate with us (Allen, 2012) as well as helped us to facilitate a fruitful discussion about all photos taken by children which would not be possible if children took unlimited number of photos (Samonova et al., 2022). Following the task completion, each child was interviewed one-on-one using questions recommended by Wang and Burris (1994), to help them talk about their photos - (1) “What do you see on this picture”? (2)”What is happening here”? (3)”Why did you take this picture”? Participants were able to articulate and clarify the concepts shown in the pictures. These discussions were recorded, and then the transcript was written.

2.3. *Data Analysis and Findings*

The images and the transcripts for the images were the main sources of data. The pictures were segregated in three broad categories or themes (1) Open spaces (2) Semi Open Spaces and (3) Built Spaces. Ninety-three photographs clicked by 10 children from school-1 (S-1) were analysed. The transcripts associated with each photo were examined. Pseudonyms are used to protect participants’ confidentiality. The segregation of photos was done based on the physical characteristics of the school environment as depicted in the photographs as per the spatial categories: indoor spaces, outdoor spaces, and transitional spaces. This segregation allowed for a deeper analysis of recurring themes within each spatial category (LeCompte, 2000).

Following the categorization based on the physical characteristics of the school-built environment (open spaces, semi-open spaces, built spaces), the photographs were compiled alongside the children's corresponding narratives.

The figures and tables sequentially placed below explore how the children experience the school-built environment. They examine the three key themes: Emotional Connection, Behavioural Engagement, and Cognitive Understanding. Through their descriptions, the children reveal how the environment influences their feelings, activities, and appreciation for nature.

Fig.2.*Compiled Photographs of Open Spaces (Playgrounds/Maidans/Pitches) Highlighting Student Interaction with Physical Attributes*

Table 1

This table summarizes children's descriptions for playground experiences analyzed under the three key themes: Emotional Connection, Behavioral Engagement, and Cognitive Understanding. The children express how the playground environment influences their feelings, activities, and appreciation for nature.

Theme	Codes	Key findings
Emotional Connection (Affective)	Friends, love (for basketball), peaceful, calmness, uplifts mood	The children highlight the social aspect (friends) and the positive emotions associated with the ground. They mention feelings of peace, calmness, and an uplifted mood while being under the trees and surrounded by nature.
Behavioral Engagement (Behavioral)	Basketball, cricket, playing, sitting, talking, running, breeze, PT exercises	The children describe various activities they engage in on the ground, showcasing its multifunctionality. These activities include playing sports (basketball, cricket), sitting and talking with friends, running around, and PT exercises. The mention of the natural breeze suggests a connection between the physical space and sensory experiences.
Cognitive Understanding (Cognitive)	Nature, trees, plants, flowers, beautiful	The children mention appreciating the natural elements like trees, plants, and flowers. While not explicitly stating the ecological importance, the participant seems to connect these elements with feelings of relaxation and enjoyment.

Fig.2 and Table 1 Analysis: The school ground has a positive impact on the student's emotional and social well-being. It highlights how the space facilitates various activities, fosters social interaction, and provides a connection with nature that contributes to relaxation and enjoyment.

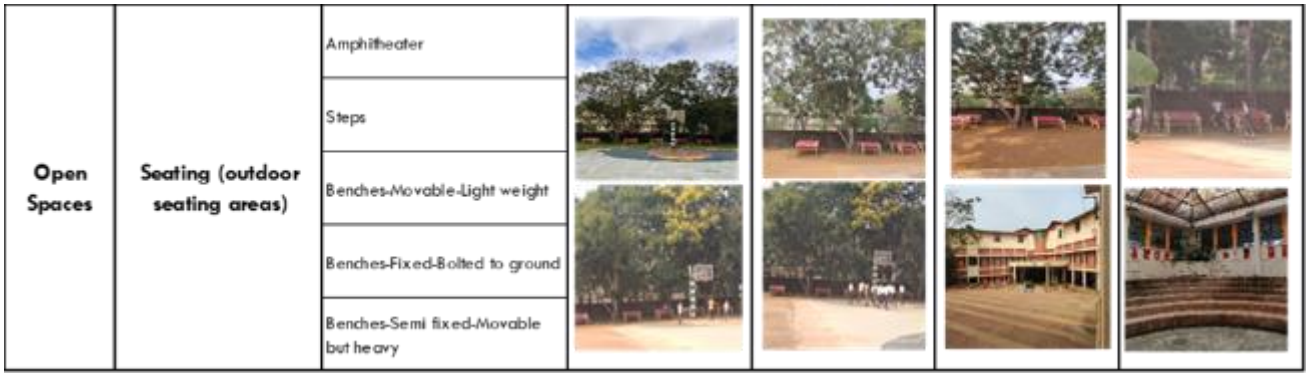

Fig.3. *Compiled Photographs of Open Spaces (Outdoor Seating) highlighting student interaction with physical attributes*

Table 2
This table summarizes children's descriptions for Outdoor Seating experiences analyzed under the three key themes: Emotional Connection, Behavioral Engagement, and Cognitive Understanding. The children express their feelings, activities, and appreciation for nature

Theme	Codes	Key Findings
Emotional Connection (Affective)	Friends, gossip (positive social interaction), enjoying the scenery (plants, flowers, leaves), cool breeze, relaxation	Children emphasizes on the social aspect (friends, gossip) and the feeling of relaxation associated with the ground. They mention about enjoying the natural scenery (plants, flowers, leaves, cool breeze) and how it contributes to a positive mood.
Behavioral Engagement (Behavioral)	Sitting, talking, enjoying the breeze, shade, resting after playing, competitions (steps)	Children describe various activities they engage in on the ground, highlighting its multifunctionality. These activities include sitting and talking with friends, enjoying the cool breeze and shade after playing, and having fun competitions on the steps.
Cognitive Understanding (Cognitive)	Plants, trees, shade, nature	Children mention about appreciating the natural elements like plants, trees, and shade. The children seem to connect to these elements with feelings of relaxation, enjoyment, and creating memories.

Fig.3 and Table 2 Analysis: Children feel relaxed and enjoy the social interaction taking place on the benches placed under the shade of the trees. These benches allow them to rest, feel the cool breeze and view their friends playing suggesting the characteristics foster a connection with nature.

Fig.4. *Compiled Photographs of Open Spaces (Landscaping & green spaces) highlighting student interaction with physical attributes*

Table 3

This table summarizes children's descriptions for the Landscaping & green spaces experiences analyzed under the three key themes: Emotional Connection, Behavioral Engagement, and Cognitive Understanding. The children express their feelings, activities, and appreciation for nature

Theme	Codes	Description
Emotional Connection (Affective)	Friends, talking, relaxation, calmness, wonder (observing flower varieties)	The transcript emphasizes the emotional comfort and sense of peace the student finds in this natural space. They describe sitting and talking with friends, observing the changing flora (hibiscus flowers, white flowers), and feeling calmed by the presence of plants and birds, especially before and after exams.
Behavioral Engagement (Behavioral)	Sitting, talking, observing plants, exploring fallen fruit.	The participant describes various activities they engage in near the flowerbed, highlighting interaction with nature. These activities include sitting and talking with friends, observing the growth of flowers and fallen fruit (Indian berries), and exploring the changing flora throughout the seasons.
Cognitive Understanding (Cognitive)	Plants, flowers, birds, fruits, seasons	The transcript demonstrates the student's awareness of the natural world. They mention specific plant types (hibiscus, ferns), fruits (Indian berries), and seasonal changes (ripening season).

Fig.4 and Table 3 Analysis: The landscape and green spaces in the school-built environment offer a tranquil environment that fosters relaxation and social interaction (talking with friends). The children demonstrate awareness of the natural world by mentioning about the seasonal variations, the flowers and birds they could see which contributed to their sense of peace and relaxation.

Fig.5. *Compiled Photographs of Semi Open Spaces (architectural features/amenities) Highlighting Student Interaction with Physical Attributes*

Table 4

This table summarizes children's descriptions for the Semi Open Spaces (architectural features/amenities) and their experiences analyzed under the three key themes: Emotional Connection, Behavioral Engagement, and Cognitive Understanding. The children express their feelings, activities, and appreciation for nature.

Theme	Codes	Description
Emotional Connection (Affective)	Peace, Calmness (quiet corridor), Enjoyment (trees, nature)	Children mention about finding peace and calmness in the quiet corridor and feel happy to see the combination of buses and trees.
Behavioral Engagement (Behavioral)	Sitting, talking with friends, observing nature	Children describe the activities like sitting and talking with friends at the drinking water facility while enjoying the view of trees and nature. They also mention using the quiet corridor during breaks.
Cognitive Understanding (Cognitive)	Trees, nature, space	The transcript shows some awareness of the surroundings by mentioning elements like trees and nature.

Fig.5 and Table 4 Analysis: The Semi Open Spaces provided within the school environment offer various opportunities to the children that contribute to children's well-being. The children's descriptions explore how these features foster positive emotions (peace, enjoyment), encourage social interaction (talking with friends), and promote awareness of the natural world (trees, nature).

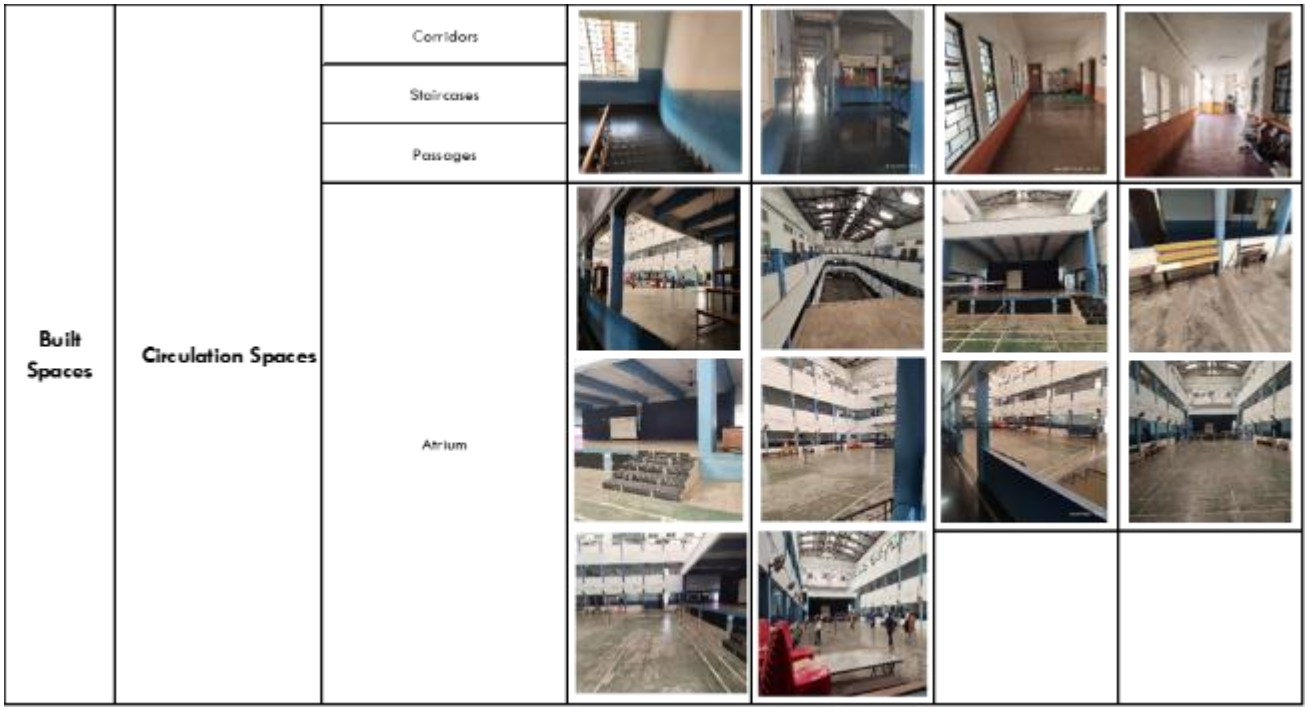

Fig.6. *Compiled Photographs of Built Spaces (circulation spaces) highlighting student interaction with physical attributes*

Table 5
This table summarizes children's descriptions for the Built Spaces (circulation spaces) and their experiences analyzed under the three key themes: Emotional Connection, Behavioral Engagement, and Cognitive Understanding. The children express their feelings and activities they are involved when in those spaces

Theme	Codes	Description
Emotional Connection (Affective)	Enjoyment (watching assemblies, learning new things, playing sports), Winning (table tennis competition)	The children express enjoyment from watching performances and presentations during assemblies, learning new things from classmates, and playing badminton and table tennis.
Behavioral Engagement (Behavioral)	Playing badminton, table tennis, watching assemblies, attending presentations, physical exercise periods	The children describe various activities the student engages in at different locations within the school grounds. These include playing badminton and table tennis, attending assemblies, watching presentations, and attending physical education periods.
Cognitive Understanding (Cognitive)	Learning (assemblies, presentations), Sports (badminton, table tennis)	The children showcase the awareness of different functions the spaces serve. They mention using the quadrangle as badminton court, having assemblies and seva activities, the table tennis room for practice and competitions. They highlight the opportunities for learning new things during assemblies .

Fig.6 and Table 5 Analysis: The Built Spaces provided within the school environment offer various opportunities that contribute to children's well-being. The children's descriptions reveal the enjoyment they get from assemblies, playing badminton and doing service activities in the atrium. The staircase provides them a calming pause area with a to the natural world. Their suggestion for adding indoor plants in the atrium that children can take care of demonstrates a desire for bringing in nature into the interior spaces.

Fig.7. *Compiled Photographs of Built Spaces (rooms & spaces) Highlighting Student Interaction with Physical Attributes*

Table 6
This table summarizes children's descriptions for the Built Spaces (rooms and spaces) and their experiences analyzed under the three key themes: Emotional Connection, Behavioral Engagement, and Cognitive Understanding. The children express their feelings and activities they are involved when in those spaces

Theme	Codes	Description
Emotional Connection (Affective)	Comfort (library - quiet space), Enjoyment (reading with friends in library, doing science experiments), Fun (classroom with friends)	The children find the library's quiet atmosphere conducive to reading and studying. They enjoy the social interaction with friends while reading and doing in science experiments in labs. The classroom environment foster a sense of fun and companionship.
Behavioral Engagement (Behavioral)	Reading (library), Experiments (science labs), Social interaction (library with friends, classroom)	Children mention about the various activities in different spaces. These include reading and browsing books in the library, conducting experiments in science labs, and socializing with friends during breaks and while reading.
Cognitive Understanding (Cognitive)	Learning (library, science labs), Knowledge (library)	The library is emphasized as a place for acquiring knowledge through books. Science labs are mentioned in the context of conducting experiments, suggesting a link to learning scientific concepts.

Fig.6 and Table 5 Analysis: Children describe the school as a place that caters to various student needs. The library emerges as a place for quiet study and social interaction with friends. Science labs provide opportunities for hands-on learning through experimentation. Classrooms, though not clearly mentioned for focused learning, serve as important social spaces where students connect and share experiences.

Fig.8. *Compiled Photographs of Built Spaces (elements of aesthetics/building blocks/building spaces) Highlighting Student Interaction with Physical Attributes*

Table 7
This table summarizes children's descriptions for the Built Spaces (elements of aesthetics/building blocks/building spaces) and their experiences analyzed under the three key themes: Emotional Connection, Behavioral Engagement, and Cognitive Understanding. The children express their feelings and activities they are involved when in those spaces

Theme	Codes	Description
Emotional Connection (Affective)	Pride (wall of fame - personal achievement), Inspiration (entrance message), Relaxation (window view of nature, greenery), Enjoyment (playing outdoors, PT exercises, socializing with friends)	The student feels a sense of pride upon seeing their achievement displayed on the wall of fame. The inspirational message at the entrance motivates them. Looking out the window at nature provides a sense of relaxation, and the greenery in the corridors adds to the positive atmosphere. The transcript highlights enjoyment derived from playing outdoors, participating in PT exercises, and socializing with friends in various locations.
Behavioral Engagement (Behavioral)	Observing (watching sports from window), Playing (basketball, table tennis, badminton, cricket), Social interaction (chatting with friends), Learning (observing the school's history on the wall of fame)	The transcript details various activities the student engages in different spaces. These include observing sports from the window, playing various games on the grounds, socializing with friends in different areas (corridor, PT area, classrooms), and learning bits of the school's history from the wall of fame.
Cognitive Understanding (Cognitive)	History (wall of fame), Nature (plants, trees)	The wall of fame serves as a reminder of the school's history and the student's own achievements. The transcript mentions plants and trees, suggesting some awareness of the natural environment.

Fig.8 and Table 7 Analysis: The children portray the school as a place filled with life and opportunities for connection. It's a place that fosters a sense of belonging (wall of fame), motivates students (entrance message), and provides opportunities for relaxation (nature views), enjoyment (games, friends), and even unofficial learning (observing sports). The student creates a personal connection to various spaces based on the activities and experiences associated with them.

3.Discussion

The findings of this study highlight the significant role played by the school environment, particularly the school grounds, in shaping students' emotional and social well-being. The school grounds serve as a multifunctional space that facilitates various activities and fosters social interaction among students. It emerges as a social hub where students could relax, connect with friends, and create lasting memories. Furthermore, the presence of nature elements like trees and plants within these spaces enrich this experience by fostering a sense of peace, enjoyment, and providing a backdrop for social interaction. Spaces adorned with natural elements were described as refuges and sources of comfort for the children. These spaces provided opportunities for social interaction with friends, relaxation during breaks, and a connection to the changing seasons. Students described a sense of wonder and appreciation for the natural world through observing plant growth and the presence of birds.

Children described the aesthetics and ambience of various places within the school premises highlighting the functional aspects. For example, students find beauty in the harmonious blend of buses, with natural elements like trees while appreciating the quiet corridor as a space for relaxation during breaks.

Similar to the school ground, other spaces within the school were perceived as significant catering to diverse student needs. The library emerged as a space for quiet study and social interaction with friends, while science labs provided opportunities for hands-on learning through experimentation. Classrooms, though not explicitly mentioned for focused learning, served as important social spaces where students connected and shared their experiences.

The atrium facilitated both recreational and educational activities. It is been used for playing badminton, attending assemblies and doing seva (service) activities. Notably, the children emphasize the multifunctional nature of this space. The children's narratives highlight the potential for incorporating nature into this indoor environment making it evident that they have a keen awareness of the benefits of access to nature within the school environment. They have suggested adding various indoor plants to create a calming and visually appealing atmosphere.

The student-led nature club could be given responsibility of caring for the indoor plants which would further integrate nature awareness and student engagement within the space.

Overall, the children portrayed the school as a place brimming with life and opportunities for connection. It fostered a sense of belonging through the wall of fame, motivated students with messages at the entrance, and provided opportunities for relaxation (nature views), enjoyment (games, friends), and even unofficial learning (observing sports). The students formed personal connections to various spaces based on the activities and experiences associated with them.

Through this study, photovoice emerged as an effective method for understanding the experiences of school children regarding their surroundings and their perceptions towards the various interconnected spaces of the school-built environment.

Limitations

The study's conclusions should be viewed with caution due to its limitations. The study's limited sample size and lack of racial and ethnic variety limit its generalizability to the entire school student population.

Implications for Research and Practice

This study may have significant implications for research and practice. The study's findings provide potential approaches for enhancing school design to foster nature connectedness in youngsters. For example, a comparable study should be repeated with a more varied sample of students to see if any new or similar trends emerge. Given the importance of the school's constructed environment, it would be worthwhile to conduct this study across other schools to make regional comparisons. Furthermore, a thorough evaluation of the relationship between the school's constructed environment and nature connectedness is required. Specifically, quantitative research may look into the relationship between opportunities to spend time outside during the school day. Future school-based photovoice research should give students the opportunity to share their work with school leaders.

4.Conclusion

This research project investigated children's perspectives on the school-built environment. The focus of the study was to understand how children experience and perceive the school-built environment comprising of the open spaces, semi-open spaces, and the built spaces. School environments built for children's learning and development are mostly designed based on adult perspectives. This study aligns with the growing body of research that emphasizes the importance of school design in fostering student well-being (Kellock & Sexton, 2018). It goes beyond viewing educational environments as purely functional, exposing how children give them meaning via their daily experiences. The study emphasises nature's major impact on the school environment. Children's stories emphasise recollections of playing under trees, feeling the cool breeze, and watching the miracle of fruit growth. These encounters not only develop a sense of location and belonging, but they also ignite curiosity and develop a love for the natural world.
The photovoice method used in this study proved to be effective as it allowed children to voice their experiences and views, revealing the hidden language of the school environment. Through their voices, we acquire better knowledge of how nature on school grounds and the school premises develops a connection with the natural world, which help children for their overall development and well-being. These findings urge a shift in how we design the school environment to focus on nurturing this connection with nature. Integrating green spaces, promoting outdoor activities, and incorporating children's voices into the planning process are all crucial steps. By fostering a relationship with nature within the school compound walls, we can cultivate a generation of environmentally conscious individuals with a deep appreciation for the natural world. We need to understand what the children want by hearing to their voices and accordingly incorporate them in the building design thus, designing an environment for children which is evolved through their voices.

References

Adams, S., & Savahl, S. (2017). Children's Discourses of Natural Spaces: Considerations for children's Subjective Well-Being. *Child Indicators Research*, *10*(2), 423–446. https://doi.org/10.1007/s12187-016-9374-2

Adams, S., Savahl, S., & Fattore, T. (2017). Children's representations of nature using photovoice and community mapping: Perspectives from South Africa. *International Journal of Qualitative Studies on Health and Well-Being*, *12*(1). https://doi.org/10.1080/17482631.2017.1333900

Allen, Q. (2012). Photographs and stories: Ethics, benefits and dilemmas of using participant photography with Black middle-class male youth. *Qualitative Research*, *12*(4), 443–458. https://doi.org/10.1177/1468794111433088

Arola, T., Aulake, M., Ott, A., Lindholm, M., Kouvonen, P., Virtanen, P., & Paloniemi, R. (2023). The impacts of nature connectedness on children's well-being: Systematic literature review. *Journal of Environmental Psychology*, *85*(May 2022), 101913. https://doi.org/10.1016/j.jenvp.2022.101913

Bromfield, N. F., & Capous-Desyllas, M. (2017). Photovoice as a Pedagogical Tool: Exploring Personal and Professional Values with Female Muslim Social Work Students in an Intercultural Classroom Setting. *Journal of Teaching in Social Work*, *37*(5), 493–512. https://doi.org/10.1080/08841233.2017.1380744

Brunnberg, E. (2005). The School Playground as a Meeting Place for Hard of Hearing Children. *Scandinavian Journal of Disability Research*, *7*(2), 73–90. https://doi.org/10.1080/15017410510032163

Caulkins, M. C., White, D. D., & Russell, K. C. (2006). The Role of Physical Exercise in Wilderness Therapy for Troubled Adolescent Women. *Journal of Experiential Education*, *29*(1), 18–37. https://doi.org/10.1177/105382590602900104

Chawla, L. (2020). Childhood nature connection and constructive hope: A review of research on connecting with nature and coping with environmental loss. *People and Nature*, *2*(3), 619–642. https://doi.org/10.1002/pan3.10128

Collins, D., & Coleman, T. (2008). Social Geographies of Education: Looking Within, and Beyond, School Boundaries. *Geography Compass*, *1*, 281–299.

Davies, D., Jindal-snape, D., Collier, C., Digby, R., Hay, P., & Howe, A. (2013). Creative learning environments in education — A systematic literature review. *Thinking Skills and Creativity*, *8*, 80–91. https://doi.org/10.1016/j.tsc.2012.07.004

Ernst, J., & Theimer, S. (2011). Evaluating the effects of environmental education programming on connectedness to nature. *Environmental Education Research*, *17*(May 2011), 577–598. https://doi.org/10.1080/13504622.2011.565119

Frantz, C. M. P., & Mayer, F. S. (2014). The importance of connection to nature in assessing environmental education programs. *Studies in Educational Evaluation*, *41*, 85–89. https://doi.org/10.1016/j.stueduc.2013.10.001

Gordon Masi, E. S. (2018). *Repurposing Spaces in Schools To Encourage Social*.

Grunseit, A. C., O'Hara, B. J., Drayton, B., Learnihan, V., Hardy, L. L., Clark, E., Klarenaar, P., & Engelen, L. (2020). Ecological study of playground space and physical activity among primary school children. *BMJ Open*, *10*(6), e034586. https://doi.org/10.1136/bmjopen-2019-034586

Indira Dutt. (2012). School Design and Students' Relationships with the Natural World. *Children, Youth and Environments*, *22*(1), 198. https://doi.org/10.7721/chilyoutenvi.22.1.0198

Jørgensen, C. R., & Allan, J. (2022). Our school: our space–inclusion and young people's experiences of space within an English secondary free school. *International Journal of Inclusive Education*, 1–21. https://doi.org/10.1080/13603116.2022.2073059

Joyce, H. D. (2018). Using Photovoice to Explore School Connection and Disconnection. *Children and Schools*, *40*(4), 211–219. https://doi.org/10.1093/cs/cdy021

Kasali, A., & Doĝan, F. (2010a). Fifth-, sixth-, and seventh- grade students' use of non-classroom spaces during recess: The case of three private schools in Izmir, Turkey. *Journal of Environmental Psychology*, *30*(4), 518–532. https://doi.org/10.1016/j.jenvp.2010.03.008

Kasali, A., & Doĝan, F. (2010b). Fifth-, sixth-, and seventh- grade students' use of non-classroom spaces during recess: The case of three private schools in Izmir, Turkey. *Journal of Environmental Psychology*. https://doi.org/10.1016/j.jenvp.2010.03.008

Kellock, A., & Sexton, J. (2018). Whose space is it anyway? Learning about space to make space to learn. *Children's Geographies*, *16*(2), 115–127. https://doi.org/10.1080/14733285.2017.1334112

Khan, S., & Kotharkar, R. (2012). *Performance Evaluation of School Environs : Evolving an Appropriate Methodology Building*. *50*(July), 479–491. https://doi.org/10.1016/j.sbspro.2012.08.052

LeCompte, M. D. (2000). Analyzing Qualitative Data. *Theory into Practice*, *39*(3), 146–154. https://doi.org/10.1080/10293523.1993.11082322

Martin, L., White, M. P., Hunt, A., Richardson, M., Pahl, S., & Burt, J. (2020). Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *Journal of Environmental Psychology*, *68*(January), 101389. https://doi.org/10.1016/j.jenvp.2020.101389

Monteblanco, A. D., & Moya, E. M. (2021). Photovoice: Integrating course-based research in undergraduate and graduate social work education. *British Journal of Social Work*, *51*(2), 712–732. https://doi.org/10.1093/bjsw/bcaa154

Najafi, M., & S, M. K. M. (2012). *The concept of place attachment in environmental psychology*. *45*, 7637–7641.

Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The nature relatedness scale: Linking individuals' connection with nature to environmental concern and behavior. *Environment and Behavior*, *41*(5), 715–740. https://doi.org/10.1177/0013916508318748

Nyika, L. (2022). Methodological reflections on the use of photovoice in school health research. *Health Education Journal*, *81*(5), 638–645. https://doi.org/10.1177/00178969221099213

Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, *47*(December 2016), 88–94. https://doi.org/10.1016/j.gloenvcha.2017.09.009

Rigolon, A., & Alloway, M. (2011). Children and their development as the starting point: A new way to think about the design of elementary schools. *Educational and Child Psychology*, *28*(1), 64–76.

http://ezproxy.umsl.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=59574396&site=ehost-live&scope=site

Samonova, E., Devine, D., & Luttrell, W. (2022). Under the Mango Tree: Photovoice With Primary School Children in Rural Sierra Leone. *International Journal of Qualitative Methods*, *21*, 1–12. https://doi.org/10.1177/16094069211053106

Schultz, P. W. (2002). Inclusion with Nature: The Psychology Of Human-Nature Relations. *Psychology of Sustainable Development*, *January 2002*, 61–78. https://doi.org/10.1007/978-1-4615-0995-0_4

Shamsuddin, S., Bahauddin, H., & Aziz, N. A. (2012). Relationship between the Outdoor Physical Environment and Student's Social Behaviour in Urban Secondary School. *Procedia - Social and Behavioral Sciences*, *50*(July), 148–160. https://doi.org/10.1016/j.sbspro.2012.08.023

Shepard, P. (1982). Nature and Madness. In *Nature and Madness*. The University of Georgia Press Athens & London. https://doi.org/10.1353/book11484

Sobko, T., Jia, Z., & Brown, G. (2018). Measuring connectedness to nature in preschool children in an urban setting and its relation to psychological functioning. *PLoS ONE*, *13*(11), 1–17. https://doi.org/10.1371/journal.pone.0207057

Todt, D. (2006). Louv, Richard. (2005). Last child in the woods: saving our children from nature-deficit disorder . *SCHOLE: A Journal of Leisure Studies and Recreation Education*, *21*(1), 136–137. https://doi.org/10.1080/1937156x.2006.11949572

Wyra, M., & Lawson, M. J. (2008). *Wellbeing in the School Yard a photovoice study*. 1–18. http://search.proquest.com/docview/764358136?accountid=9851%5Cnhttp://tf5lu9ym5n.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rfr_id=info:sid/ProQ:australianeducationindex&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=c

Zylstra, M. J., Knight, A. T., Esler, K. J., & Le Grange, L. L. L. (2014). Connectedness as a Core Conservation Concern: An Interdisciplinary Review of Theory and a Call for Practice. *Springer Science Reviews*, *2*(1–2), 119–143. https://doi.org/10.1007/s40362-014-0021-3