

Organize the schoolyard landscape to build a comprehensive and creative learning space

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ABSTRACT

The school is fundamentally an educational facility that provides learning spaces and environments for students under the guidance of instructors. In contemporary educational trends, learning is no longer confined to the classroom but extends to the school grounds, which serve as a setting for engaging outdoor classes. These spaces stimulate creativity and foster the holistic development of students. Through surveying, data collection, synthesis, and analysis, this paper analyzes the significance of school ground landscape organization and proposes design guidelines to optimize this space for the purpose of holistic education in primary schools.

Keywords: School yard; Landscape; Outdoor education; Study space.

1. INTRODUCTION

In recent years, primary education has increasingly prioritized the renovation of teaching and learning methodologies. This focus aims to cultivate an innovative learning environment that is both close to nature and actively promotes student engagement. The implementation of outdoor learning sessions represents one key solution adopted. Crucially, the organization and design of the school courtyard landscape play an instrumental role in the effective realization of this pedagogical approach.

Empirical research has demonstrated that outdoor learning enhances independent thinking capacity, communication skills, and environmental stewardship among students. Consequently, the school courtyard landscape must be conceived not merely for aesthetic enhancement, but to function as an effective pedagogical tool. This strategic design approach is crucial for substantially elevating the overall quality of education.

Pursuant to Vietnamese National Standard TCVN 8793:2011 [1], the designated area for courtyards and greenery (including landscape planting, playgrounds, and sports fields) must be at least 40% of the total school area.

This regulation ensures a substantial spatial allocation for the school grounds within the overall architectural planning.

Nonetheless, current practical implementation in Vietnam encounters significant challenges in effectively transforming the school courtyard space into an outdoor classroom environment:

- Limitations in area: many schoolyards are still not large enough, especially in urban areas, and have not yet fully utilized their potential for educational purposes outside the classroom. These areas are often only used for physical education activities and do not effectively support other subjects or creative activities. Moreover, most schools cannot organize theatrical events or large gatherings outside the classroom due to the lack of venues of suitable size and capacity because they were not designed from the outset.

- Absence of standardized design: There is a current lack of standardized design specifications for outdoor classrooms, resulting in significant design heterogeneity across different schools.

- Unfavorable climatic conditions: Adverse weather patterns, specifically the intense heat and solar exposure during the

dry season and the prolonged precipitation characteristic of the wet season, pose significant operational constraints on the consistent implementation and maintenance of outdoor classroom activities.

- Lack of proper guidance and teaching methods: Teachers are not properly trained in outdoor classroom management methods.

- Limited financial resources: Renovating and building outdoor classroom spaces requires funding, while many schools are struggling with budget constraints.



Figure 1. The schoolyard is narrow and small, failing to ensure sufficient area, thus affecting the comprehensive quality improvement in education [2].



Figure 2. The schoolyard is often only used for physical education activities and does not effectively support other subjects or creative activities [3].

2. RESEARCH METHODOLOGY

2.1. Study scope and objectives

- Research subject: The schoolyards at primary schools in Vietnam.

- Collection and synthesis of relevant content/literature from diverse domestic and international sources.

- Analysis and evaluation will be conducted, leading to the proposal of several recommendations for optimizing school ground landscaping to best leverage the outdoor environment for holistic education.

2.2. Selected case studies

2.2.1. Research on outdoor classroom design in schoolyard gardens

The study, “Research on the design of outdoor classrooms in school gardens,” was authored by Elif Satiroglu, Selda AL Sensoy, and Abdullah Yasin Dunda. This work was published in 2023 in the Journal of Architectural Sciences and Application, JASA 2023 [4].

The research findings determined that the impacts of outdoor classrooms on students are grouped into four distinct categories: cognitive, motor, emotional development, and social development.

2.2.2. The organization of architectural landscape space in general education schools in Vietnam

“The organization of architectural landscape space in general education schools in Vietnam” is a study authored by Pham Anh Tuan, published in the Journal of Science and Technology in Civil Engineering [5].

The paper asserts that a strategic balance between in-class and outdoor activities contributes significantly to the holistic character development of students in general education schools. Accordingly, functional integration is identified as the optimal design solution for landscape strategies within contemporary general education schools.

2.2.3. The organization of semi-outdoor spaces in schools adaptable to weather conditions.

The study, “Organization of semi-outdoor spaces in schools adaptable to weather conditions” was conducted by Tran Minh Tung and Nguyen Thuy Duong, published in the Architecture Magazine [6].

The article posits that the integration of semi-outdoor spaces into school architecture serves as a method of ecologizing modern architecture through the incorporation of traditional and indigenous approaches. The practical solutions regarding semi-outdoor spaces are argued to achieve several simultaneous objectives: increasing the spatial diversity within the school environment, enhancing the architectural appeal of the school facility, and improving educational effectiveness through activities conducted in these semi-outdoor areas.

3. RESULTS AND DISCUSSION

3.1. *Factors influencing students' holistic development in educational settings*

Holistic student development within the educational setting refers to the balanced progress across various domains: physical, intellectual, emotional, social, and moral.

The primary factors influencing the holistic development of students in schools are:

- Educational paradigm: Traditional didactic model; integrated learning approach ...

- Physical Infrastructure: Learning spaces (classrooms), recreational areas (playgrounds), library facilities, green spaces, technology-enhanced learning support systems ...

- Instructional Quality: Teacher proficiency and qualifications, diversified teaching methodologies...

- Curriculum design: Integration of academic rigor, soft skills, and experiential learning activities.

- Parental engagement and involvement: Academic support provision, contribution to educational orientation and strategy...

Consequently, the educational framework must transcend a singular focus on academic metrics (e.g., test scores) to prioritize the holistic development of the student population. It is imperative to design a curriculum that maintains equilibrium among formal learning, recreation, and skill acquisition activities.

3.2. *The significance of school grounds landscape in pedagogical settings*

The school grounds are indispensable within the educational environment, delivering substantial benefits to students, educators, and the broader school community. In contemporary pedagogical discourse, the outdoor environment transcends its conventional function as a mere recreational zone; it now contributes fundamentally to the comprehensive education of students. The strategic design and efficient utilization of campus outdoor spaces serve to foster creativity, cultivate social cohesion (or *esprit de corps*), and support the psychological well-being of the student body. Consequently, the school grounds should be conceptualized not merely as a “playground,” but rather as an “open-air classroom” (locus of outdoor learning), wherein students can engage with nature, participate in co-curricular activities, and develop essential life skills.

The school grounds – when subjected to rational landscape planning and organization – are transformed into an exceptional laboratory for the natural world. This space simultaneously serves as a crucial area for physical conditioning, and an environment designed to catalyze learning inspiration among all students.

We must conceptualize the school grounds as a dynamic setting where educators can directly utilize natural resources and apply knowledge disseminated within the classroom to practical scenarios. It is a spatial configuration that enables both students and teachers to transition seamlessly from the confines of the indoor classroom to purpose-designed outdoor locations for focused learning, collective assembly, discourse, and recreation. This environment is where students can articulate their pride regarding collaborative projects undertaken or the botanical specimens they have cultivated and maintained. This perspective allows us to definitively establish the functional role of the school grounds, thereby applying the educational landscape philosophy to the

design of the surrounding school environment. Ultimately, this approach is intended to facilitate the integration of site-specific resources to enrich the existing curriculum and promote effective hands-on (experiential) learning experiences.



Figure 3. Organization of the open-air classroom: Facilitating access to fresh air and novel experiential learning to support holistic development [7].

3.3. Essential elements for outdoor classroom landscape organization

- The school grounds must prioritize unrestricted, highly accessible spaces characterized by an open and permeable spatial configuration that facilitates ease of circulation. Outdoor learning locations should be strategically situated away from sources of significant noise and high-traffic zones to enhance student concentration and pedagogical efficacy. Furthermore, the integration of mature tree canopy and green infrastructure is essential to generate a comfortable, shaded microclimate, thereby promoting a relaxed and restorative atmosphere for the student body.

- The design and layout of the school grounds landscape must prioritize the absolute safety of students throughout their engagement in outdoor learning activities. Critical components such as pathways, circulation routes, and play surfaces must be constructed using non-slip, durable, and certified safe materials. Furthermore, the inclusion of essential functional utilities is required to support instructional needs, including the provision of outdoor

chalkboards, whiteboards, reconfigurable seating, and study desks.

- The strategic implementation of green infrastructure (tree planting and vegetative design) extends beyond the provision of essential shading and microclimate control. It serves as a dynamic resource for curriculum delivery, offering students tangible learning opportunities in biology, ecology, and environmental stewardship. Suitable plant species can be systematically integrated throughout the school grounds, simultaneously enhancing the aesthetic quality of the landscape and serving as functional resources for lessons in natural sciences and life sciences.

- A significant design consideration involves the integration of aesthetic and generative components. The school grounds landscape can be augmented through the incorporation of didactic murals, innovative artistic models, instructional signage, and thematic banners that convey educational content. This creative application serves to actively encourage student involvement in the co-creation and enhancement of the campus environment. Ultimately, this approach is critical for two reasons: it fosters a relaxed and conducive learning atmosphere, and it strategically stimulates students' creative capacity and creative expression through engagement in outdoor pedagogical activities.



Figure 4. Learning and experiential engagement in the cultivation and maintenance of the campus flower garden [8].

3.4. Development orientation for school grounds landscape

3.4.1. Rational functional zoning and the diversification of learning and recreational spaces.

Outdoor learning activities currently occur infrequently throughout the academic year. While physical education predominantly constitutes the subjects held in the exterior environment, other disciplines such as science, arts, and other subjects can and should also be integrated into the outdoor setting.

The clear functional segmentation of the school grounds is essential to optimize utilization goals and serve the diverse needs of the student population. Key functional spaces should encompass the following:

➤ *Physical activity and athletic conditioning zones:* This spatial category is allocated for the pursuit of physical activities and health promotion, encompassing elements such as:

– Sports facility area: Provision of a dedicated athletic zone for students, accommodating sports such as football (soccer), basketball, badminton, and other forms of physical exercise.

– Jogging track: The circulation paths encircling the school grounds should be designated and designed as a running track, thereby promoting daily physical activity and student conditioning.



Figure 5. The designated sports facility area within the school grounds [9].

➤ *Outdoor learning environments:* The establishment of a curriculum-driven spatial configuration designed for the utilization of

outdoor pedagogy across the entire academic program:

– Botanical gardens and vegetable cultivation areas: These zones facilitate student inquiry into biology, botany, and horticultural practices (or practical farming).



Figure 6. Student engagement in planting activities within the experimental school garden zone [10].

– The designated zone for natural sciences education



Figure 7. Sand play area: Mathematical concepts are supported through experimentation with volume, mass, and flow dynamics [11].

➤ *Creative and relaxation area:* Provides a relatively quiet and secluded space for individuals who need quiet and rest outside of the classroom, strategically located away from the active play area.

– Reading garden: A serene and tranquil area designed to provide students with repose and opportunities for sustained reading engagement in an outdoor setting.



Figure 8. Spatial configuration of the outdoor reading area within the school grounds [12].

– The art and creative expression zone: A dedicated generative space allocated for disciplines such as fine arts, sculpture, and the exhibition of student-created artifacts/products.



Figure 9. A dedicated zone for the exhibition of student-created works [13].

➤ Zone for major communal events: A dedicated area for the staging of artistic performances, scholarly presentations, and community-wide engagement activities.

3.4.2. Leveraging the natural ecosystem

The organization of school grounds landscape, particularly through the strategic selection and arrangement of trees, shrubs, and the cultivation of the surrounding natural environment, can embed a multitude of themes and lessons for student inquiry. These themes include:

– Ecosystem conservation and restoration: The retention of mature/heritage trees, the construction of small ponds or water features, and the planting of indigenous species are critical measures to enhance habitat diversification.

– Creating micro-habitats for fauna: The introduction of specific plant varieties designed to attract butterflies and nesting birds serves to establish an optimal environment for biological observation and ecological study.



Figure 10. A Segment of the school grounds designed to foster free play, creativity, and interaction with the natural environment [14].

– Stormwater management and natural drainage zones: The implementation of a robust rainwater harvesting and reuse system for irrigation purposes and for facilitating scientific experimentation.



Figure 11. Rainwater harvesting and reuse system [15].

3.4.3. *Flexible and environmentally responsive design, coupled with climate-appropriate infrastructure investment.*

The landscape design must prioritize both flexibility and sustainability:

– Environmentally friendly: Utilizing timber, recycled plastics, non-fired bricks, and natural stone to minimize the overall ecological footprint.

– Open walkways and circulation

corridors: Designing interconnected pathways with protective overhead canopies to ensure all-weather usability and year-round functionality.

- Multifunctional spaces: Areas configured for dual or multiple uses, such as integrating sports courts with an outdoor amphitheater or dedicated dining areas.

3.4.4. *Training educators in outdoor instruction techniques*

Guidance on structuring lessons and interactive activities appropriate for open environments; Integration and application of technology to support outdoor instruction.

3.4.5. *Enhancing community engagement and participation*

The school community, and particularly the student body, plays a pivotal role in the development and sustained maintenance of the school grounds landscape. Students are not merely the beneficiaries of the built environment; they should also be integrated into the process of participatory design and the continuous enhancement of the learning environment. This integration includes:

- Contribution of innovative concepts: Students are encouraged to generate creative proposals for outdoor learning environments, recreational zones, and green amenities that align with their functional and pedagogical requirements.

- Survey participation and feedback provision: Educational institutions should organize consultation sessions to solicit student input on landscape design, thereby facilitating the adjustment and pragmatic enhancement of the spatial configuration.

- Support for landscape stewardship and maintenance: Students can actively participate in afforestation initiatives, garden cultivation, environmental protection efforts, and the fostering of greater awareness of green spaces.

- Applied experiential learning: Involvement in the landscape design and stewardship process actively supports the development of students' teamwork

proficiency, critical thinking skills, and environmental responsibility.

- Furthermore, the implementation of volunteering programs is recommended: Students, parents, and educators can collaboratively participate in afforestation campaigns (tree planting), garden maintenance, and space upkeep; Additionally, organizing annual sports days and artistic events serves to foster community cohesion.

3.4.6. *Landscape assessment and maintenance*

- Scheduled maintenance planning: Establishing routines for drainage system inspection, vegetation pruning, pest control, and general cleanliness/sanitation of the school grounds.

- Evaluation of space utilization efficacy: Collecting feedback from educators and students to inform necessary design adjustments and ensure optimal spatial configuration.

- Integration of green technology: Utilizing solar-powered lighting systems, implementing rainwater recycling, and installing automated irrigation systems.

3.5. *Organizational methodologies for outdoor learning environments*

When the school grounds have achieved a rational and optimized organizational structure, the implementation of outdoor teaching methodologies becomes significantly more straightforward and effective. Several approaches applicable within the outdoor learning environments of primary schools include:

- Experiential learning: Subjects such as natural sciences, geography, and biology can be conducted directly in the outdoor setting. Students gain firsthand exposure to natural phenomena and acquire knowledge concerning flora, fauna, topography, meteorology, and the authentic living environment.

- Collaborative group work and learning games: Beyond theoretical lectures, the school grounds serve as an optimal space for organizing

educational games and group activities that cultivate students' communication, cooperation, and creative thinking skills. The integration of physical activities with academic content will significantly enhance student engagement and interest.

– Structuring art and expressive sessions: The school grounds can also be utilized as a venue for organizing artistic activities such as painting, singing, and dancing, thereby allowing students to manifest their creativity and individual talents. These sessions not only facilitate student repose but also promote the development of artistic abilities and cultural appreciation.

3.6. Case studies of schools with rational functional zoning

– *JingLong primary school, Futian district, Shenzhen, China*: This institution features an architectural design that integrates the playground function across all six vertical levels of the building. Centrally located on each floor is an Open-Air Room (OAR): a space covered by the floor above but intentionally devoid of perimeter walls. This configuration creates a covered multi-weather play area where students can engage in physical education, organized activities, and general recreation regardless of climate conditions. Moreover, it serves as an outdoor classroom, facilitating both pedagogical instruction and practical application by educators, while offering a unique setting for student learning and discourse [16].



Figure 12. JingLong primary school – featuring a design that vertically integrates the playground function across all six floors [16].

Sentia school: Sentia is a multi-level school located in the center of Hanoi. The school features a unified system of communal playgrounds for students, which is complemented by separate play areas specifically zoned by age group. A series of “green” recreational zones and a rooftop garden are integrated and interspersed among the academic blocks. The selection of plant varieties is highly diversified, serving both to stimulate student interest in nature and biology, and to function effectively as a thermal insulation and air purification solution [17].



Figure 13. Sentia school: featuring the primary playground strategically positioned between the building blocks [17].

4. CONCLUSION

The school grounds should be conceptualized as more than mere spaces for daily activities and recreation; they are vital environments for students to engage in experiential learning and gain exposure to practical knowledge within a natural, proximate setting.

The organization of the outdoor learning environment must prioritize openness and clear visibility, featuring multifunctional learning zones such as scholastic gardens, exterior art spaces, and dedicated areas for sports and educational games.

Ultimately, establishing a green, multifunctional, and pedagogically-driven school ground will cultivate an ideal environment for the holistic development of students, nurturing both their intellectual capacity and physical well-being.

The outdoor classroom model offers

substantial benefits for primary students in Vietnam but simultaneously encounters considerable difficulties and challenges. To ensure effective implementation, systemic adjustments are required across infrastructure, pedagogical methodologies, and policy support from educational administrative levels. Concurrently, the collaboration between the school, teachers, parents, and the wider community is essential for cultivating a creative, nature-proximate learning environment, thereby contributing to the enhancement of primary education quality in Vietnam.

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