

Indoors and Outdoors: schoolyards as learning and playing opportunities

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Abstract

Recent research on schoolyards demonstrate that these environments a substantial role for the teaching and learning aspects of education (see Woolner& Stadler-Altmann, 2021; Stadler-Altmann, 2016). Nevertheless, academic inquiries into schoolyards have rarely incorporated the perspectives of students and teachers. Mainly, the activities of students during the breaks for recreation (see Powell et al., 2016), as well as possibilities for movement (e.g. Stanley et al. 2012) for students have been examined. The teachers' perspective has only been studied in educational policy discourses (see Larsson, 2013) and in questions of supervision and control of students during breaks. Our paper examines the student's view on schoolyards and outdoor areas: approximately 8.000 students completed a questionnaire during 2005-2011 about the satisfaction with, and the importance of, their schoolyard. The students also described their activities there. Our data made it obvious, that students prefer schoolyards with different zones of action and silence, public and private. These results differ in primary and secondary school students and in a gender perspective. We also surveyed 360 teachers about size, equipment, and design of their schoolyards. Both surveys provided distinct insights which did not completely correlate with one another. The aim of our paper is to highlight what transformational processes can take place in schoolyards and outdoor areas, considering that they are educational spaces. Based on the perspective of students and teachers, we develop fundamental ideas for the educational design and usage of schoolyards as an important area of school development and ascertain the need for further research in this field.

Keywords: Pedagogical space, Schoolyard, Design and Use of Schoolyards, Outside and Inside Areas, Didactics and School Development

Introduction: School building – Schoolyard – School surrounding

The term “schoolyard” generally describes all areas, which are used by students or by school staff in their free time or for lectures. Mostly these flat areas are near the school building, fenced and not open for the community. The size of schoolyard depends on the school type and the school location: In primary school we often find bigger schoolyards as in secondary schools. Schools in rural areas usually have more space for their schoolyards while schools in towns have often very small schoolyards. Although progressive movements of the late nineteenth century in school architecture can be observed, traditional school buildings and traditional schoolyards constitute the majority: these schoolyards are flat, without equipment for learning or playing, fenced and with only small amounts of vegetation. This organisation suggests that most of these playgrounds were planned as spaces for the breaks between lessons (for more details, see Buddensiek, 2008; Montag Stiftung, 2011).

Current Situation

Recent developments in our society have led to a reduction of open space available to children and adolescents within and around residential areas. They spend much of their time in school, in class or in after-school programs. Physical inactivity and an inactive lifestyle are common risk factors for health, even during childhood (see Möhrle et al, 2015). Against the background of health problems, lack of social competencies, increasing aggressive behaviour and weaknesses in motor-driven and coordinative skills of our children, the quality of schoolyards are even more important. The planning and designing of schoolyards are fundamental in order to connect the pedagogical processes practiced indoors, with the pedagogical possibilities outdoors, but the transference of these processes is deficient in most cases. Neither school-facility maintainers, planning architects nor teachers are aware of the importance of schoolyards for the students' everyday school life, for social learning and recreation. Most of the time, schoolyards are only places used for the purpose of supply or disposal.

Pedagogical relevance of school building and schoolyard
School buildings and schoolyards are physical surroundings which are used in a daily routine. Nevertheless, school buildings and schoolyards also fulfil basic needs. Steele mentions (1973) that the physical environment can influence the way teachers and students feel, think and behave. Following his considerations, Weinstein (2007, 2011) argues that five of Steele's functions are especially important for teaching and learning:

Security and shelter: These are the most fundamental functions of all built environments. Physical security is a precondition that must be satisfied, at least to some extent, before the environment can serve students' and teachers' further, higher-level needs. Additionally, psychological security is also an important precondition; that is, the feeling that school and schoolyard are safe, good and comfortable places to be.

Pleasure: Equally important is the fact that teachers and students find their school buildings, schoolyards and classrooms attractive and pleasing. Some educational studies demonstrate that an aesthetically pleasing environment can influence behaviour (see Barrett et al, 2015).

Symbolic identification: The so-called personality or character of school buildings, schoolyards and classrooms is the product of this function, when they are used and equipped for daily routine by teachers and students.

Task instrumentality: This function describes the ways in which the environment helps to carry out the tasks teachers want to accomplish.

Social contact: The design of schoolyards can support or retain social interaction, if the schoolyard has zones defined for action and rest, e.g. a playground, an outdoor lounge or a school garden.

Based on these basic needs schoolyards could be designed with pedagogical and didactical aspects in mind. However, schools and schoolyards also have to fulfil pragmatic and technical requirements and nowadays financial and spatial limitations dominate school building and schoolyard design. These different perspectives have to be balanced when inside and outside school spaces are to be changed in a pedagogical way.

Schoolyard & School surrounding: Views of Students & Teachers

The importance of school buildings, classrooms, schoolyard and school surrounding for teachers' and students' practice had been ignored for many years (see Martin, 2002): Most teachers do not think about their school and schoolyard as an environment built for teaching and learning. Rather, they focus on the restrictions of their school building and their schoolyard (see Walden, 2009; Weinstein, 2007 & 2011). Students often see the bad conditions in their schools and their schoolyards. However, when students and teachers were asked in more detail – for example in the studies of Woolner et al. (2007, 2011, 2012, 2013) – teachers and students were able to describe the school buildings and schoolyards they desired. A detailed overview about educational research in children's views and preferences regarding the outdoor environment for the northern European countries is given by Norðdahl and Einarsdóttir (2014).

If educators thought about better conditions for teaching and learning in our schools and classrooms, we would realise that a focus on the constructed environment and the possibilities it affords teaching and learning. Hence, the perspectives of teachers and students are seen and included in our study (for more details see Stadler-Altmann & Hilger, 2017).

Method: Schoolyard Survey

Beginning with the test development in the school year of 2007/2008, pupils and teachers were surveyed annually. The two surveys were developed from students at university in different courses and with advice from different lecturers. The sample comprises results from 8.100 learners from the first to the tenth grade, aged six to eighteen years. The sample consists of 3.952 girls and 4.203 boys (91 missing), so 48.5 % of the participating students are female. Furthermore, 368 teachers were polled of which 75.6 % were primary school teachers and 21.9 % secondary teachers (273 primary school teachers, 79 secondary school teachers, 9 missing). The dataset was evaluated and analysed by using the program SPSS.

Students were asked to name break activities and features they would like to have on their schoolyards. We used open and polar questions. Response categories were determined by pre-examinations. The teachers' questionnaire included information about their schools, size of schoolyard and, if existing, of school garden, fixed gymnastic apparatus, fixed plays, and playground with material and special facilities in the schoolyard.

Results

Students' views

The average of 2.1 (on a scale from one – very good - to four – very bad) shows that students are *satisfied* with their schoolyards in general. Aspects of *design and arrangement* are regarded even more positive (1.62). Usage *beyond teaching time* in the afternoon is, for example, interesting (mean 1.26) but not specified. Overall, there are no considerable differences between genders. Boys and girls appear to decide in an identical manner about their outdoor learning environment.

There are age specific differences, that are portrayed by the youngest (6-year-olds) and the oldest (18-year-olds). Older students are generally less satisfied with their *schoolyard design* and its *arrangements*.

These statistics raise the question: What are students doing on their schoolyards? We asked for different activity categories, which are lonely activities (*to be on my own*), *calm play*, and *action* that primarily consists of intense physical activities. In general, students rate very similar between categories. Active break behaviour; however, attracts more attention. In our research, we found slight differences between genders. Generally, girls prefer the *calm play*, whereas boys rather like activities that include intense physical exercises such as football (soccer). Interestingly, older students typically prefer lonely activities (*to be on my own*) and *calm play*. We

separated the category *what would you like to have on your schoolyard?* into two areas: *Resting* (herein belongs the wish for sitting accommodations) and *Action* (for example, the wish for a football/soccer field or a basket for basketball). In this category certain trends are evident: There are small gender specific differences; for example, girls rather prefer aspects of *Resting* areas; especially older female students who favour rest areas rather than aspects of *Action* areas. Especially boys favour areas of the field *Action*, but with rising age this preference decreases.

The last part of the questionnaire refers to special wishes. The results of our survey rank a playground and a kiosk (a small shop where students can buy snacks or drinks during the breaks) at the top of the wish list. Like before, the *Wish List* category only shows small gender specific differences; age specific differences, however, are again recognisable. Nevertheless, these comparisons of the results – especially between 6-year-old and 18-year-old students – are not significant due to the small number of participants (see Table 1 below) in these groups. We choose these results to highlight the extremes of students’ rating.

Table 1: Students’ wish list

	Kiosk		Fireplace/ Barbecue place		School-garden		School pond		Playground	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
all	1.40	7559	1.75	7655	1.66	7882	1.54	7931	1.37	7756
boys	1.38	3914	1.68	3944	1.82	4039	1.60	4064	1.40	3971
girls	1.43	3672	1.83	3699	1.49	3831	1.48	3854	1.33	3378
6 year	1.64	11	1.64	11	1.75	12	2.00	12	1.67	12
18 year	1.00	4	2.00	4	2.00	4	1.58	4	1.00	3

Teachers’ View

The results of the teachers’ survey focus on the size of schoolyard, gymnastic apparatuses, fixed plays, special facilities and lendable games and toys. In contrast to the students’ survey, a high average value represents consistent.

Furthermore, we must differentiate between qualitative as well as quantitative aspects. The size of the schoolyard as such is commonly referred to as insufficient. In contrast to the size, the conditions in the subcategories receive a more positive rating.

Table 2: Teachers’ view

	Mean	N
Size of Schoolyard	2.27	306
Fixed gymnastic apparatus	3.29	281
Fixed plays	3.13	326
Special facilities	2.92	326
Lendable plays	3.71	311
Overall assessment	2.95	347

By looking at the results of primary school teachers, we recognise the following differences: In primary schools the size of the schoolyards is rated somewhat adverse. Furthermore, special equipment as well as gymnastic devices are ranked far better than the schoolyard size. This statistic correlates with how teachers generally view the equipment of primary schools in a significantly more positive light. It would seem that the bigger the schoolyard, the better the ratings. Correspondingly, the presence of a school garden also leads to more positive results and a big school garden even more. The question remains: are primary schools better equipped?

Discussion

This study was conducted in a middle-sized town in Germany and the data is gathered from two independent questionnaires completed by students and teachers over more than five years. The findings indicate that in general students and teachers are satisfied with their schoolyards in general and satisfied with the design of their schoolyard. One explanation could be that students and teachers are not aware of the possibilities of a well-designed schoolyard. Alternatively, they have little or no conception of what a well-designed schoolyard for teaching and learning could look like. As others mentioned, the role of schoolyard is neglected or forgotten. Nevertheless, there are many ideas to use the schoolyard as a successful teaching space, such as for science and mathematics lessons in primary schools (see Herrington et al. 2008), or as a space for sustainable education and development in schools (see Rentsch et al 2013). Another one could be that the schoolyard has no importance for their daily life at school. As Derecik (2015) put it, schoolyards fulfil many preconditions for informal and formal learning opportunities; it follows that teachers have to be trained and qualified to use these.

The younger students who participated in our research enjoyed being outside and having activities situated there, which is consistent with previous research (see Norðdahl&Einarsdottir, 2014), indicating that young children share this sentiment in different countries. The differences between the younger and the older students concern activities on the schoolyard during the lessons' breaks: younger students prefer physical activities and active plays; older students prefer low-key activities and calm conversations. This is consistent with research in pedagogical psychology about the development of activities during childhood and youth.

Additionally, the students in this study were inventive and came up with detailed wishes and different ideas of playing equipment that they thought could encourage and give opportunities for interaction, e.g. a fireplace and a school pond. We suppose that on the one hand these ideas are an indicator, that students identify themselves with school and like to enhance their surroundings. On the other hand, these ideas could be utilised to make the schoolyard more familiar.

The findings in the teachers' answers were alike. Primary school teachers rated the size and design of their schoolyards positively, if the outdoor surrounding were designed to fit the needs of younger students. Both, primary and secondary school teachers rated the schoolyard positively, when the yard was big enough and was augmented by a school garden. The importance of a school garden in the answers is an indicator for the role of education for sustainable development in schools nowadays.

The findings of this study indicate that diversity in the environment was important to all students and teachers, and thus emphasis should be placed on the natural environment in the design of outdoor surroundings at school, as well as on built elements and the size of schoolyards.

Conclusion: Concepts for Schoolyards as Learning and Playing Opportunities

Schools and schoolyards could be spaces for teaching and learning with typical duties and responsibilities. Hence, schools and schoolyards are pedagogical spaces with typical effects which will often be described as a hidden curriculum (see Kemnitz 2001: 48). Taking this into consideration, schoolyards have to be planned as learning environments to transfer the pedagogical ideas and methods to physical (outdoor) surroundings. As a result of our findings, we will outline some principles for planning and designing schoolyards. According to the postulation of a variety of educational research (see for instance, Dietrich 2005), the results in our surveys and the wishes of students, we define four principles:

- 1) Design of schoolyards as part of the pedagogical concept
- 2) Participation of all school members
- 3) Constant design process
- 4) Steps of schoolyard transformation

Although our findings can serve as catalysts for changing schoolyard situations and establishing outdoor learning projects, most changing processes and outdoor learning projects are inspired and implemented by teachers (see Broda 2011:4), often as a starting point for a school development process. In this sense it is important to make a distinction between beautification projects and schoolyard enhancement. In the results of our questionnaire that was distributed to teachers and students, students desired more beautification projects (see table 1: wish list) of their schoolyards. In contrast, teachers thought about outdoor teaching and learning opportunities according to size, design, facilities and greening of their schoolyards (see table 2). Consequently, the closing of this article focuses on the educational changing process, when designing the schoolyard is understood as a method of school development.

Design of schoolyards as a part of the pedagogical concept

As we see in our two surveys, a consensus emerges amongst students and teachers: schoolyards should be teaching and learning spaces, thereby supporting communication and recreation, in turn providing possibilities for physical activities and being a living part of nature and environment.

As spaces for teaching and learning, schoolyards reflect the teaching and learning culture of a school (see Cunningham, 2010). Approved pedagogical methods such as open learning, phases without work or project teaching need to be considered in the design of the schoolyard. For children (up to 12 years) the method of sensory, observatory and hands-on learning is to be given priority. For adolescents, school grounds are interesting as a place of learning and lecture only if as many subjects as possible are taught in open spaces. Hence, schoolyards have to be integrated into everyday school life, such as a place in which to observe fauna and flora, as an experimental field for sensory experience or as an individual place for quiet activities. As a consequence of different needs during childhood and adolescent, schoolyards have to provide different opportunities, including fixed games and a well-equipped playground in primary schools and a schoolyard with zones for communication, recreation and silence in secondary schools.

Schoolyards are also a space for recreation, relaxing and private retreat. Students who do not think about school when they are having their break are more receptive and concentrated during class (see Cunningham, 2010). Therefore, schoolyards need to have a pleasing flair, small and divided quiet zones, wind and weather protected places, and suitable plans, which promote a sense of well-being, as well as recreation and re-activation of the senses, specifically: seeing, feeling and smelling.

In the healthy development of children, schoolyards play an important role. Playing around as compensation for the lack of physical activity in the classroom means communicating, experiencing the skills of the body, experiencing material and social relations. Physical activity also promotes self-regulation (see Delidou et al, 2016) and intellectual, motor and psychosocial skills and competencies, which are learned via physical activity (see Ericsson, 2012), presumed that there is sufficient time and space. By extension, schoolyards have to provide the opportunity for youth to experience the relation between cause and effect, to provide the opportunity of swinging, going down a slide, balancing, rolling, climbing and spinning. Balance, body co-ordination, reaction speed, agility, power and perseverance are important prerequisites for being able to actively avoid accidents, in schools and in every-day life. Looking at our results, we find that according to the age of the students, the possibilities for physical activities are rated highly.

Green schoolyards provide the opportunity to come into contact with nature through all senses (see Dahlgren, 2000). The change of the seasons can be experienced, ecological correlations are illustrated, and students could do research for the class on the living object. A school garden designed for ecological variety offers natural habitats for flora and fauna in an area of settlement. Students could realize very early, what sustainability means by the economical use of natural resources and so global correlations become clear and transparent. Based on these pedagogical and didactical ideas the teachers in our survey rated their schoolyard more positively when there was a school garden (see 2.2.2 teachers' view), irrespective of how and if it was used.

Participation of all school members

The planning and designing of schoolyards have to respect all school members' needs, aspects of gender mainstreaming and provide the opportunity for multiuse with multifunctional equipment. The very different expectations and ideas are seen in our results.

Schoolyards should allow room for co-operative and social acting. Hence, activities and interaction on the schoolyard could help finding identity through joint and social thinking and learning and this plays an important role in learning democratic rules. In participatory processes (see Woolner 2010, or Weyland et al. 2019) students, teachers and other school staff experience school as a habitat, something where there is room for designing and thus as an area to test one's own effect on others. This factor implies that planning considerations should include options such as sustainable utilisation and careful treatment of the schoolyards, which will be the place for development of present and future generations of users.

Constant design process

Schoolyards must comprise several areas suitable for change and new interpretation by future generations of students and teachers (see Stadler-Altmann, 2016a; 2016b). Future users should not be confronted with the results of planning and designing of past activities and thus making them to pure consumers of the schoolyards, but opportunities are to be provided that they can get active themselves, can change and make own experiences.

Over the past twenty years (see Broda 2011) there has been a growing interest in making the schoolyard more functional and appealing. Many early efforts focused almost entirely on the installation of play equipment that offered a broader variety than the traditional swings and sliding boards. Even the students in our study wished more of these features on their schoolyard. The teachers recognised the school grounds as a space not only for recreation but also for instruction. All these different perspectives have to be taken into account in planning and transforming processes.

Steps within schoolyard transformation

With regard to the students' and teachers' perspectives of schoolyards, the steps of designing and planning such an environment must be based on the pedagogical concept of each individual school. Therefore, the school community has to be involved and needs to answer the fundamental, educational questions (see Dietrich 2005: 121ff), as a practical guide through schoolyard development, as explained in detail by Stadler-Altmann 2019.

Design of schoolyards as part of school development

As seen in the chapter before, planning and designing a schoolyard needs to be a participatory process and in this sense the design of schoolyards is part of school development.

As Woolner and Tiplady have shown, the "change in parts of the physical school setting and the inclusion of specific features was able to produce change in learning and social practices" (Woolner & Tiplady 2015: 79). In this case study they present an instance of relatively successful educational change in facilitating rapid whole school cultural and pedagogical change. The starting point in this transformation process was the schoolyard greening. The significance of the schoolyard for teaching and learning cannot be underestimated, as shown in our study. An educationally motivated redesign of the school environment might therefore be an essential step in school development.

In general, school development processes must focus on learning enhancement. Schoolyard transformation could foster these in two ways: "1) The schoolyard can provide a venue, or backdrop, for an activity (e.g., going outside to read a story). 2) The schoolyard can provide the content and serve as an essential element of an

activity (e.g., going outside to use a statistical sampling technique to estimate the population of ants in the school lawn). Both approaches are very valid uses of schoolyard-enhanced learning. In both cases the outdoors serves as an instructional resource and provides a valuable change of pace and place. Just the simple act of occasionally going outside for class and using the schoolyard as a classroom can energize a lesson and refocus attention.” (Broda 2007: 99). However successful the considerations will be in relation to teaching and learning, schoolyard transformation is a part of school development and schoolyards are planned and designed in respect of the needs and wishes of students and teachers.

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