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Secondary school students' perspectives and use of three school grounds of varying size, content and design

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Abstract:

School grounds can have multiple values, and especially sufficient size, green elements, variation, integrated design and participatory development have been described as positive qualities. However, many studies have focused on pre-school and primary school grounds, while less is known about school grounds for adolescents. This study explored how secondary school students experience and use school grounds of varying size, content and design. The study included one class in year 8 (aged 14-15) at each of three schools in southern Sweden. A questionnaire with mainly open questions was distributed, followed by both individual interviews and walking interviews with four students from each class. The results show that school grounds were appreciated, but also that many chose to stay indoors. Large surface area and varied content, with ball courts, greenery, seating and multifunctional equipment, were valued, but a school ground design with integrated and pleasant settings, allowing socialising and activities, particularly support use by secondary school students.

Keywords: adolescents, children's perspectives, green space, landscape architecture, schoolyard, teenagers

Highlights:

- School ground access is considered highly valuable by secondary school students
- Well-functioning design and content are key but require sufficient area size
- Vegetation, multifunctional structures, seating and ball courts are preferred
- Integrated, green, pleasant and accessible settings for socialising and activities
- Better adapted school ground design can support use, also by girls

Introduction

School grounds are places for everyday play that can provide multiple benefits for children, supporting their physical and mental health, learning and development (O'Brien & Murray, 2007; Ridgers et al., 2007; Dymont & Bell, 2008; Chawla et al., 2014). Their design and properties vary much but have impact on children's activities (Samborski, 2010) and signal social norms and views (Dymont & Bell, 2007). One aspect which has not been sufficiently considered is how the landscape architecture of school grounds can be adapted to children's own perspectives (Jansson et al., 2014).

Studies of school ground qualities and functions for children at pre-schools and primary schools (e.g. Boldemann et al., 2006; Dymont & Bell, 2007; Paechter & Clark, 2007; Samborski, 2010; Mårtensson et al., 2009; Mårtensson et al., 2014; Jansson et al., 2014; Pagels et al., 2014) have identified school ground size, varied and green content, designs of combined settings and inclusive participatory development as valuable qualities for play, physical activity and health. Much of these qualities, found in a number of research studies of school outdoor areas, have been theorised into OPEC (Outdoor Play Environment Categories) by Mårtensson (2013). OPEC points at three dimensions: *size* ("total size of the outdoor area"), *content* ("proportion of surfaces with trees, shrubbery or hilly terrain" and *design* (form) ("integration between vegetation, open areas and play areas") (Mårtensson, 2013).

Play in areas with a natural character has been found to be more imaginative, varied, gender-mixed and creative than in other settings (O'Brien & Murray, 2007; Lucas & Dymont, 2010; Samborski, 2010; Jansson et al., 2014; Mårtensson et al., 2014). Green school grounds are also liked by children (Dymont & Bell, 2007; Lucas & Dymont, 2010) and support them in finding peace from stress, in building social relationships (Chawla et al., 2014) and in physical activity (Ridgers et al., 2007; Mårtensson et al., 2014). However, the activity level diminishes with age and is also lower among girls than boys (Pagels et al., 2014) who may both be affected by cultural views of suitable activities for them and by the fact that facilities like sport courts, attracting mainly boys, often dominate school grounds (Paechter & Clark, 2007; Pawlowski et al., 2015). According to children in grade 4 (aged 10-11), lack of space and equipment, weather conditions, conflicts and use of electronic devices limit school ground use, with girls in particular requesting more secluded places to 'hang out' (Pawlowski et al., 2014).

There is little legislation that guarantees access to high quality school grounds. The Swedish Planning and Building Act gives poor direction, stating only that schools should have "sufficiently large open surfaces for play and being out of doors in or close to the building" (SFS 2010:900). A connected general recommendation from 2015 (BFS 2015:1 FRI 1) specifies that school grounds should be large enough to offer varied terrain and vegetation without risking too much wear and placed so that children up to grade 6 (aged 12-13) can access them directly from the school building, while for grades 7-9 they should be close and easily accessible. The Swedish Board of Housing, Building and Planning recommends a school ground allocation of 30 m² per student (40 m² at pre-schools) and a minimum total area of 3000 m² (Boverket, 2015). To counteract a negative trend for vague municipal

responsibilities and shrinking, low-quality or even non-existent school grounds, it is important to increase knowledge of their qualities.

Compared with school grounds for younger children, less is known about qualities that suit secondary school students (Rickinson & Sanders, 2005; Ridgers et al., 2012). The landscape architecture of secondary school grounds therefore risks being neglected or based on assumptions on what adolescents need or prefer. The reported high importance of environments that facilitate socialising and a decrease in students' rating of both indoor and outdoor school areas from 12 to 16 years (Edgerton et al., 2011) indicate that current school environments are less fit for older students.

School grounds for adolescents

Children's uses and preferences for outdoor areas change with age, but this has not been much concerned in the landscape architecture of school grounds. From early adolescence, social activities become increasingly in focus in school grounds (Coplan et al., 2014), with more games and socialising, while younger children are more engaged in pretend play, locomotor play and exploring their surroundings (Baines & Blatchford, 2011). Before the age of 11, most children appear to highly value school grounds with green elements, play equipment, ball courts etc., while older children want more physical challenges, social hangout places and aesthetic beauty, which a combination of green elements and built structures appears to facilitate (Jansson et al., 2014; Mårtensson et al., 2014).

Much research focus has been on the diminishing amount of physical activity among adolescents, which might be connected to low school ground quality. Particularly students who change school grounds when starting secondary school lower their level of physical activity (Marks et al., 2015). In a Swedish study, only 5% of students in grade 8 (aged 14-15) were physically active for the recommended 60 minutes per day (compared with 93% in grade 2), possibly due to outdoor environment properties, including equipment and design, being more suited to younger rather than to older children (Pagels et al., 2014). Low activity levels were also found in a Norwegian study of 14-year-olds, possibly connected to facilities for sports and play not being used and to recess time being perceived as too short (Fjørtoft et al., 2010). Similarly, girls aged 11-18 in Pakistan wanted more possibilities for active play and recreation in their school grounds (Qutub et al., 2015). To counteract adolescent girls getting little physical activity, attention to both boys' and girls' school ground uses is needed (Ridgers et al., 2012).

The importance of green spaces for children in secondary school is only partially studied, and few studies have addressed the students' own experiences. Akoumianaki-Ioannidou et al. (2016) pointed out the resource that plants can be for plant contact and learning, if school ground design and learning activities support this. The Greek secondary school students they studied preferred flowers and woody species. In a broader perspective than school grounds, adolescents in both Scotland and Finland were found to appreciate green areas that are informal and more or less 'invisible' to adults, such as small wooded areas and clearings (Bell et al., 2003; Mäkinen & Tyrväinen, 2008). In contrast, Kaplan & Kaplan (2002) found that

adolescents take a ‘time out’ from nature, compared with both younger children and adults, since they focus on other interests, including increased significance of social life. Owens & McKinnon (2009) found that the environments preferred and used by teenagers often support recreation, restoration or socialising but that the importance of vegetation there varies.

There is a need for more knowledge on how school grounds can better suit secondary school children and to identify environmental factors that are of importance. The aim of this study was therefore to explore the landscape architecture of school grounds from the perspectives of secondary school students, focusing on size, content and design along OPEC (Mårtensson, 2013) as a theoretical framework. To approach the aim, the study was guided by the following research questions: How do children aged 14-15 experience and use their school grounds? What changes would they like to see? and How do their experiences, uses and requested improvements vary with school grounds of differing size, content and design?

Methods

Selection of cases

Three cases were selected based on principles of maximum variation (Flyvbjerg, 2006) in mainly size, but also to some extent content and design (see Figures 1 and 2), among municipally managed schools located in areas in southern Sweden with mid-level socio-economic status. Variation in school ground size was compared to the Swedish recommendations, with different contents and designs but with equivalent and large percentages of green space. Suitable schools were identified by studying their grounds on online maps and aerial photographs before contacting headmasters by phone.

Description of cases

The three selected schools were all situated in mainly built surroundings but in urban agglomerations of different sizes. The ‘city school’ had around 310 students (three classes per year) in grades 6-9 (aged 12-15) and was situated in a city centre (280 000 inhabitants), surrounded by a rather densely built area with other schools and housing. The ‘town school’ had around 450 students (six classes per year) in grades 7-9 (aged 13-15) and was located in a town (15 000 inhabitants), next to a residential area with detached houses, a sports court and farmland. The ‘large town school’ had around 400 students (three classes per year) in grades 4-9 (aged 10-15) and was situated on the outskirts of a large town (36 000 inhabitants), surrounded by farmland, housing and a churchyard.

The school grounds of the city school were small, 3900 m², which is above the recommended minimum total area (3000 m²), but considerably less per student (12 m²) than the recommended 30 m². The grounds of the town school were medium in size, 21 000 m², with more than the recommended area per student (46 m²), while the grounds of the large town school were extensive, 35 000 m², and provided far above the recommended area per student (87 m²). All three school grounds had grass or vegetation on around half their surface area (city school 56%, town school 51%, large town school 49%) (see Figure 1).

The small grounds of the city school (see Figures 1 and 2) contained green elements, including lawns, trees and shrubbery, mainly in front of the school building. There was also a

basketball court, bicycle parking, some benches and lounge chairs. Behind the building was mainly paving, with a painted four square ball court, benches and a few newly added growing boxes. Outside the grounds was a small gravel football court which students from grade 7 and up were allowed to use.

The medium-sized grounds of the town school (see Figures 1 and 2) contained much green space, lawns and tree and shrub vegetation. Varied terrain with green slopes and lawns divided the grounds into smaller 'rooms'. Behind the school were sport courts for bandy and basketball and a number of scattered benches. In front of the school, the grounds were mainly paved, including bicycle parking.

The large grounds of the large town school (see Figures 1 and 2) contained a mix of lawns, paving and a few trees and shrubs, mainly in the southern parts. There were also sport courts for handball, volleyball, basketball and football, a small spectator stand covered in artificial turf, a running track, a skateboard ramp and swings.

At all the three schools, students were free to decide what to do and where to go during recess (indoors, outdoors, outside the school areas) and the use of mobile phones was allowed. Recess time was also similar: usually around 30 minutes after lunch and 15 minutes in the morning and afternoon.

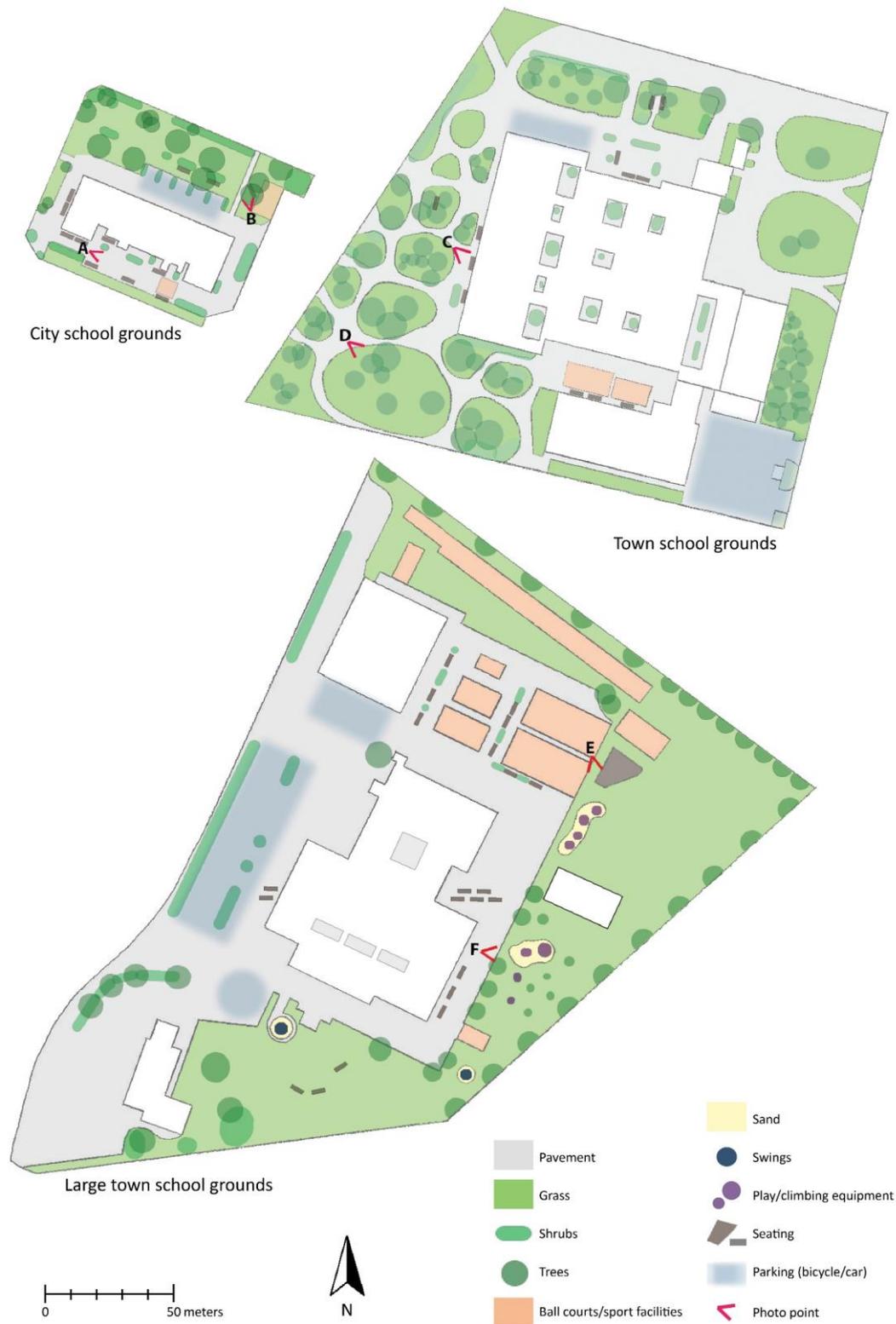


Figure 1. Plans of the three school grounds studied, showing the various sizes, contents and designs.



A The city school: School grounds south of the school building with the four square court in the background.



B The city school: Green setting northeast of the school building.



C The town school: Seating by an entrance to the school building.



D The town school: Green area south of the school building.



E The large town school: The spectator stand.



F The large town school: Setting with climbing equipment.

Figure 2. Photos of the three school grounds studied, including settings with constructions and green spaces.

Participants and procedure

The participants were the students in one class in grade 8, selected by the school staff, at each of the three schools. To allow a mainly qualitative approach, only one class per school (26-30 students) was included. The unit of a class can include a variation of e.g. gender and interests as well as some school ground use in common (Mårtensson et al., 2014). Information and written consent forms were distributed to the students' carers through the teachers. The students were informed about the study and the voluntary nature of participation. No personal information about the students was collected and the data were treated anonymously.

The data were collected in spring 2016. One landscape architecture university student was present in each class during one day, to introduce and conduct the study and answer questions. Three methods were used and combined in the study: first questionnaires in class, then individual interviews and last walking interviews in groups. Through this method triangulation, approaching an aim using multiple methods including children (Simkins & Thwaites, 2008), also outdoor methods, a more complex description of environments from children's perspectives can be collected (Cele, 2006).

The large town school was studied first. Out of 30 students, around two-thirds being girls, 25 completed the questionnaire. The students were not asked to provide details of gender in the questionnaire, but it was added for the other two schools. At the city school, 23 out of 27 students completed the questionnaire (12 girls, 11 boys). At the town school, 23 out of 26 students in the selected class completed the questionnaire (10 girls, 13 boys). Two girls and two boys from each school were selected for interviews in dialogue with the teacher. Since one of the selected male students at the town school changed his mind about participating, the four interviewees there became three girls and one boy.

Questionnaire survey

Students completed the questionnaire on paper individually during a full class lesson. The questionnaire (Table 1) was designed to collect information on their experiences, use and requested improvements of their school grounds with a mixed and mainly qualitative approach (see e.g. Johnson & Turner, 2003). It contained two multiple choice questions with possibilities for comments and seven open questions.

Table 1. The questionnaire questions

1. Where do you most often spend recess time? (In the school grounds/Indoors/Somewhere else (where?)). Also please state if the time spent is dependent on season, weather or other factors.
2. How often do you spend at least 15 minutes of your recess time in the school grounds? (Always/At least once per day/More rarely).
3. What do you think of your school grounds? Why?
4. Which is your favourite place in the school grounds? Describe it.
5. What do you usually do in your favourite place?

6. What would you like to do in your school grounds that you cannot do today?
7. If you could wish anything for your school grounds, their improvement or outlook, what/how would that be?
8. What do you think is important to have in good school grounds?
9. Is there anything else you would like to say about your school grounds?

Individual interviews

The individual interviews were conducted in group rooms next to the class rooms. They were semi-structured (Kvale, 1996) and short, supported by an interview guide with proposed questions, but giving some room for adjustments, follow-up questions and for the students to bring up other aspects. The interview guide (Table 2) contained 18 open questions about experiences, use and requested improvements. Each interview lasted around 15 minutes and was recorded. Notes were also taken.

Table 2. Interview guide questions

How often do you spend recess time in the school grounds?
- in winter?
- in summer?
Are there things you would like to do in the school grounds in winter?
What do you usually do in the school grounds during recess time?
What do your friends usually do during recess?
How important do you think it is to be able to do these activities?
Is there something that could improve the school grounds?
If you compare with what you did in the school grounds when you were younger, do you think school grounds still suit your preferences now?
Would school grounds with only sitting spaces be sufficient or is other content still of use?
If you had been given opportunity to participate when school grounds were being planned, what would you have suggested?
Is there something that you would like to change about your school grounds?
Is there something that you find is unnecessary and should be removed?
How important do you find the presence of green elements such as trees, shrubs and hillocks, in school grounds?
What do you think about having for example fruit trees or berry bushes in the school grounds?
What do you think about the size of your school grounds?
What would be better or worse with larger or smaller school grounds?
How important do you think it is to have school grounds?
On a scale from 1-10, how good do you think your school grounds are? Why?

Is there something more you would like to say about your school grounds?

Walking interviews

The interviews at each school then continued in group in the school grounds during a walking interview led by the four students, as similarly used by Pawlowski et al (2015), documented through photographs and note-taking. Walking interviews can often be combined with other methods (Carpiano, 2009), and are considered of particular value for studying children's perspectives on their environments (Cele, 2005). They gave students the opportunity to show their school grounds, continue the descriptions from the individual interviews and interrelate with each other. The students were also posed questions about how they would describe their school grounds, their preferred sites, positive and negative aspects, needs for changes and what they thought about size and green spaces.

Analysis

The individual interviews were transcribed verbatim and, together with notes from both individual and walking interviews and questionnaire responses, were analysed qualitatively through meaning condensation (as described by Kvale, 1996), where the essence of the content was extracted into shorter written descriptions and its meaning interpreted, first from each questionnaire response and interview and thereafter compiled from each school in relation to experiences, use and requested improvements. Key quotes by the students were retained, with the aim of understanding their perspectives with their own words. Answers to the multiple choice questionnaire questions were categorised according to the choices provided and compiled in MS Excel. Photographs from the walking interviews were used to support the analysis, where the comparisons between the three schools focused on the students' views and their implications for size, content and design of school grounds.

Results

Many students reported to often spend recesses indoors. The responses given to the questionnaire question "Where do you most often spend recess time?" (question 1 in Table 1) were most commonly "indoors" followed by "either indoors or in the school grounds", "elsewhere", "in the school grounds" and "either indoors or elsewhere" (see Figure 3). A large share of the students added that the choice depended on the weather and season, particularly at the large town school (21 responses), followed by the town school (7 responses) and the city school (5 responses). Despite often being indoors, and no students answered that they always spend their recess in the school grounds, many students did report to spend at least one recess period of 15 minutes per day there, particularly at the large town school, where this included 21 students (84%) while 8 (35%) in the city school and 6 (26 %) in the town school (see Figure 4).

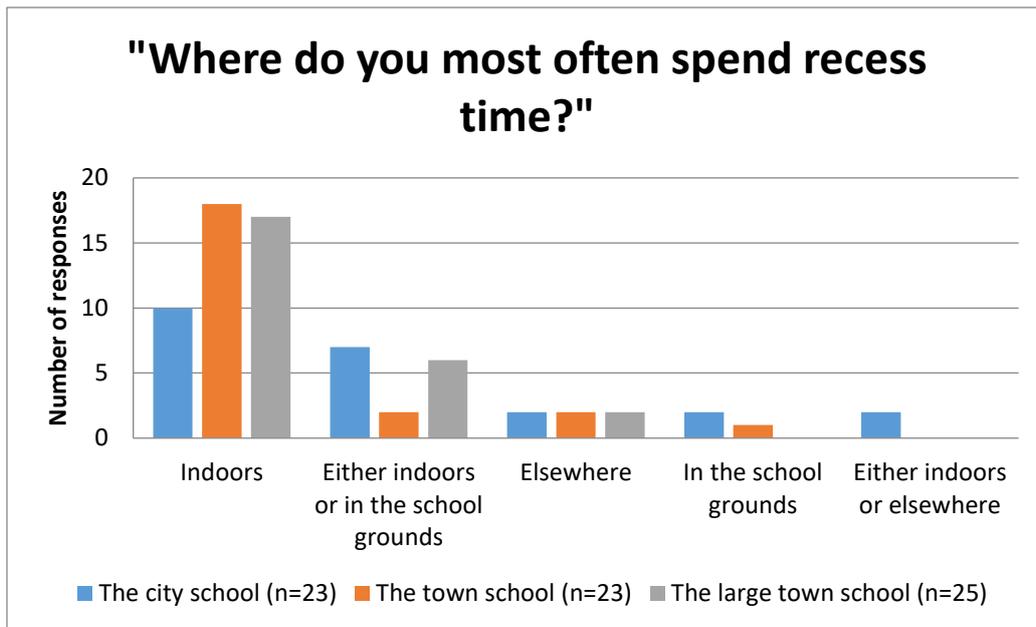


Figure 3. Diagram showing responses given to question 1 in the questionnaire (see Table 1), showing where students reported spending their recess time most often.

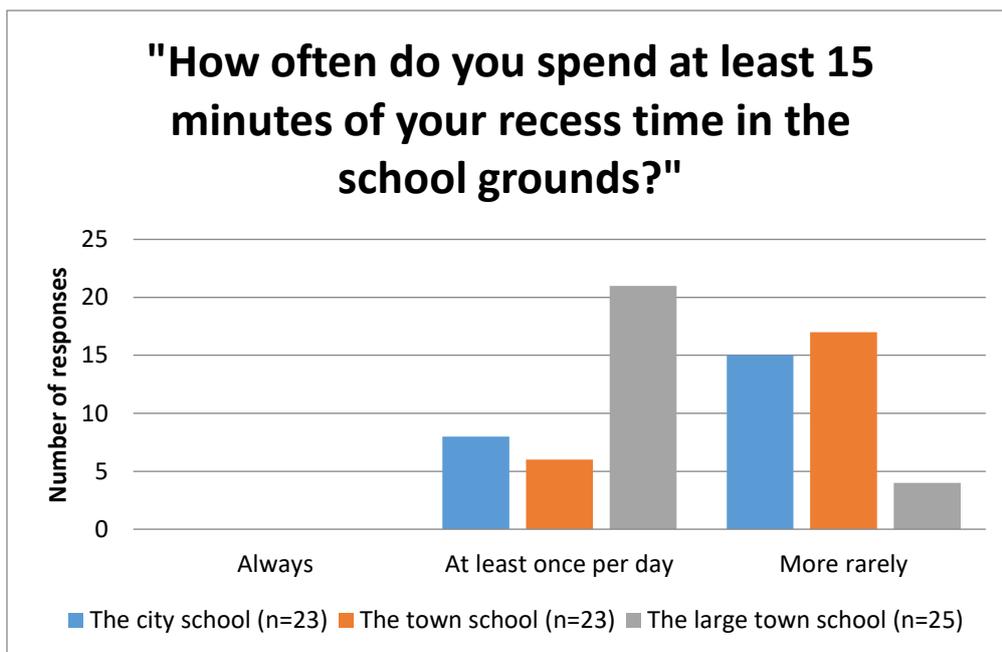


Figure 4. Diagram showing responses given to question 2 in the questionnaire (see Table 1); how often the students at the three schools reported to spend at least 15 minutes in the school grounds.

The city school – small school grounds

Experiences

At the city school, possibilities for physical activities appeared particularly important. Many students felt frustrated that they could not engage in sports, play or socialising. The grounds were experienced as boring, grey and too small, not adapted to suit them, offering little more than indoors. Ten out of the 23 students had no favourite place there. A few reported that the

grounds functioned quite well and some, mainly boys, were optimistic about finding something to do. You just “*need imagination*” as stated in one boy’s questionnaire answer. More critical students did not think they had real school grounds, lacking space and options for activities.

“When we were little we had more climbing frames and such, but now there is not so much in [the grounds] at all, so it is not very adapted [...]. It’s a little like, well, that if there are things to do then you do that. If there is nothing to do then you don’t do anything.” (girl, interview)

The students agreed on the importance of having their own school grounds “*so that you have somewhere to stay*” (girl, interview) for socialising, physical activity and recovery. Several emphasised the value of being able to go outdoors and be physically active, reducing stress and improving concentration. They also found vegetation important, expected to increase comfort, the amount of possible activities and make more students come outdoors.

“It is important [to have vegetation], you don’t want only pavement. I think it is good for the enjoyment and a nice environment. We have one tree that can be climbed over there and it is actually quite fun, so more of that would be good.” (boy, interview)

Use

Of the 23 students participating in the questionnaire survey, ten reported to often spend their recess indoors (see Figure 3) and five that this depended on season. Only one of the 12 girls spent more than 15 minutes of daily recess time in the school grounds, compared with seven of the eleven boys (see Figure 4). The four square court at the back of the school (Figure 2A) was much appreciated among the girls as a place to be active while socialising and talking, even among students not playing ball games. The football court outside the school grounds was a favourite among many boys.

“It is mostly us boys who are outdoors. The girls are usually not outside as often. We mostly play football and the girls don’t like that.” (boy, interview)

Mainly three activities were described – sitting down to talk, playing four square (mainly girls) or playing football (mainly boys). The four square court appeared important as a place to gather and gain a sense of togetherness, even among students not favouring it. The basketball court in the front of the school was little used, considered in need of improvement. Some red lounge chairs at the back of the school were popular among students who liked sitting down to talk or sunbathe (mainly girls).

Requested improvements

The students believed that larger areas would allow more variation and activities, including the possibility of withdrawing away from the “*chaos*” (boy, interview) and a more varied setting with equipment, furniture and vegetation. They wanted more facilities, including various ball courts to allow parallel use, closer proximity to make courts accessible during short recesses and artificial turf to extend the season. They also requested equipment such as swings and more flexible open spaces where they could “*find any game*” (boy, questionnaire).

More varied forms of vegetation were expected to make the grounds more beautiful and enjoyable, providing for activities such as tree climbing. Combining plants with other elements was thought to add possibilities for activities in existing green environments or creating new calm and pleasant green sitting environments.

“I would like more greenery, such as trees, shrubs, flowers and the possibility to hang out there.” (girl, questionnaire).

The town school – medium school grounds

Experiences

Among the students at the town school, the possibility to socialise in both large and small groups was a recurring theme. The school grounds were overall experienced as boring. In particular, girls found few possibilities for sitting down and talking together in a nice environment. The existing seating was placed under the roof right next to the school building (see Figure 2C), seen as a boring setting, or scattered and often appropriated by older students or even smokers. Some boys reported that the grounds functioned well for them, with good possibilities for physical activities such as football.

Students expressed e.g. not having *“any real school grounds, but rather just grass, trees and benches”* (girl, questionnaire), lacking conventional ball courts, equipment and sitting possibilities. They were positive about the large grounds with vegetation forming rooms, even experiencing the grounds as spacious, beautiful and well suited for them but found the design *“empty”* and not well adapted for socialising and sports.

“I think that we have very nice school grounds, a bit empty, but with much green. They are large and spacious, which is good.” (girl, questionnaire)

The students emphasised the importance of having school grounds. Even students who reported rarely using them valued them for others’ well-being and for the possibility of choosing whether to be there or indoors.

Use

Of the 23 students participating in the questionnaire, 18 (nine girls (90%), nine boys (69%)) reported that they most often spend their recess indoors (see Figure 3). Only six students claimed to spend 15 minutes of their daily recess time in the school grounds (see Figure 4), a choice strongly affected by weather and season. Only boys reported to usually do physical activities during recess, with ball courts as favourite places.

“The boys usually play football and that, but we mostly walk around and talk.” (girl, interview)

More than half of the students, and most girls, said that they usually spend their recess sitting, talking to friends, often by the benches just outside the entrance (see Figure 2C), which were a common favourite place. Much of the grounds were reported to be little used while a few

places, offering activities or being easy to access, were used by either boys or girls. A boy (walking interview) described a desire to play more together, but said that the girls rarely participated in physical activities like football and bandy.

The seasons and weather appeared to have a great effect on the use. Few students reported going outdoors during wintertime, other than if there was snow for snowball fights. During summer the grounds were more intensively used. Still, almost half of the students (eleven) claimed not to go outdoors even in nice weather.

Requested improvements

The most common responses were that the grounds were poorly suited to the students' age and interests but that the large area available could allow positive changes. A more inviting environment with spread out seating options, with chairs, tables and the possibility to eat outdoors, could allow greater choice in where to spend time, particularly if smoking allowance was more spatially limited.

“It is important to have grounds that are used and that can be used for something suitable and good. That it is a nice, welcoming place where many can sit down and socialise.” (girl, questionnaire).

Among boys playing football during recess, more and renovated ball courts were requested. Most students also wanted other alternatives to sports and sitting places, wishing for inclusive activities for boys and girls to engage in together. Swings were a recurring request, to use while talking or listening to music, or a play area with climbing frames and walls, trampolines and an outdoor gym.

“It is more fun to do things together than to just sit on a bench.” (boy, interview)

Some students (mainly girls) requested more beautiful greenery, finding the existing uncut trees and shrubs too straggly. They wanted nicer and calmer settings, green rooms with options to sit down and talk, where flowers would give more colour and joy and more grass instead of asphalt, for play, socialising and rest.

The large town school – large school grounds

Experiences

At the large town school, the students' experiences were strongly associated with social activities, described as fundamental for nice school grounds. The students described several favourite places, including play equipment or sport courts, often connected to socialising together or with students from other classes. They described a value in bonding in the school grounds, giving greater togetherness in the classroom.

“[The fact] that we do much together during recess has made us become a very tight-knit class.” (girl, interview)

The large school ground size was seen as very positive, with many open spaces and large play areas for the students to use. In one questionnaire, this was expressed thus: *“I find the school*

grounds good because there are many open surfaces where one can run!". Among the content, seating places were considered important and the current ones, for example on the spectator stand (see Figure 2E) were quite highly rated. The students found their grounds to have a contemporary design rather well-adapted to the needs and preferences of all children at the school.

Use

Out of the 25 questionnaire responses, 17 claimed to usually spend their recess indoors, but 21 to be outdoors for at least 15 minutes a day (see Figures 3 and 4), with much variation with seasons and weather. The students reported that the equipment and other structures encourage them to stay outdoors, used in different ways, for physical and social activities. The importance of having access to their own school grounds was clearly stated, and also of being able to make a personal choice on whether to be indoors or outdoors.

Use appeared rather varied. Popular activities and places were strongly connected to socialising by sitting down and talking, listening to music, doing sports or other physical activities and play. A range of different places were described as favourites among the students, and many appeared to find things to do:

"I find it good since there is something for everyone to do. If you want to play football you can do that, if you want to swing you can do that and if you want to talk you can do that on the turf stairs." (questionnaire).

Requested improvements

While there was a general positive view of the school grounds among the students, there were also ideas for improvement. Changes that would prolong the school ground season were proposed, including artificial turf for ball courts and a gazebo or other place protected from rain and snow, suitable for outdoor studies.

"I miss being able to work more outdoors in a good place, something that is more cosy than a bench." (questionnaire).

Several students wanted more play equipment such as swings, slides and climbing frames. More varied terrain and woody vegetation were also requested, seen as valuable both for play and for making the grounds even cosier to spend time in.

"In summer I find it fun to climb trees! But I wish that we could have more things to climb on, such as a climbing wall." (questionnaire).

Discussion

Secondary school students' experiences, use and requested improvements

This study showed that students in secondary school see great value in having their own school grounds, with the choice of going outdoors. Also, cultures concerning use appear to vary between schools, possibly affected by school ground qualities as well as by other factors, such as how long the students have had the same school grounds (Marks et al., 2015) or how their teachers promote school ground use (Christiansen et al., 2017). Overall, school ground

activities appear strongly associated with social activities, as also found by Baines and Blatchford (2011) and Coplan et al. (2014). This was especially evident at the town school, with its medium-sized grounds, with students lacking sufficient and varied places to use. At the city school, with very limited grounds, activities through both sports and socialising and larger grounds were asked for, while at the large town school, with its large grounds and varied content, social aspects were the starting point for physical activities, appreciating play equipment and vegetation.

The current school grounds were considered less suitable for the students than they were in younger years. This is similar to the findings of Pagels et al (2014) who claimed that unfit school grounds might limit physical activity among adolescents. Only the students at the large town school were to a high degree pleased with their school grounds, which were for students from grade 4, finding variation and adaptation to their preferences in the mix of green elements, built structures, equipment and various spaces. The grounds at the other two schools, smaller and quite divided into either sport surfaces or greenery, with few structures and settings for play or socialising, were considered too small, empty or not well designed.

One of the clearest results of this study was the difference in use and preferences between boys and girls. In line with e.g. Pawlowski et al (2014), particularly girls stayed indoors during recess or avoided the ball courts dominated by boys, which often make better provision for boys' recess activities than for those of girls (Paechter & Clark, 2007; Pawlowski et al., 2015). At the large town school, the students, two-thirds of them girls, were more pleased with their school grounds than at the two schools where ball courts dominated more. A variation in content, with seating, equipment and arrangements both for sports and other uses, might function well for girls too. Girls were physically active in places that allowed both socialising and physical activity, such as by the four square court at the city school, with benches and some green elements close. Such settings could support girls' physical activity and thereby their health, as proposed also by Paechter & Clark (2007).

Staying indoors was frequently reported, by girls in particular and most commonly at the town school. Similar phenomenon and gender patterns have been found by e.g. Pawlowski et al. (2015). The availability of activities, the season and the weather were factors highly affecting the choice of going outside or not. This tendency could possibly be counteracted by developing the grounds more with girls' use in mind and by providing facilities that prolong the outdoor season, offer protection from rain and are closely accessible, as proposed by the students.

School ground size

Size appeared to have an effect on how school grounds were experienced. The grounds at the city school were clearly considered too small by the students, who felt they were crowded, with difficulty to find a spot to withdraw. The students wanted places for various social and physical uses, which require space. The city school's allocation of only 12 m² per student, far below the recommended 30 m² (Boverkett 2015), appeared insufficient, even with the additional space provided by access to the nearby ball court. The recommended minimum of 30 m² per student therefore appears rather relevant in relation to this study. Space is a basic requirement allowing appropriate content and design, and has been pointed out as one of

several factors that can increase school ground physical activity (Stanley et al., 2012), but it does not alone give well-functioning grounds for secondary school students. This was particularly clear at the town school, where the students found little to do despite the rather large green areas, since the settings did not include structures that could invite them to activities and socialising.

School ground content

School ground content also appears to be of great importance for well-functioning school grounds. The results showed that mainly the students at the large town school used their entire grounds, with the more varied settings and content there being much used and appreciated. Previous studies have identified fixed equipment in general as positive for secondary school students' physical activity (Ridgers et al., 2012; Stanley et al., 2012), but along with Christiansen et al. (2017), this study specifically identified structures with an open-ended design for multifunction, such as the spectator stand and the swings, to function well for socialising and activity.

The students in this study also clearly expressed a desire for more vegetation in their school grounds. As also found by Akoumianaki-Ioannidou et al (2016), they favoured flowers and woody species, but in this study also lawns. They wanted possibilities for socialising even tree climbing in green environments, for aesthetics, restoration, and joy. Similarly, Chawla et al. (2014) found positive effects of greenery in school grounds for coping with stress, focusing and building social relations. However, like surface area, green areas alone appear insufficient for creating adequate qualities for secondary school students unless they add to a context that functions well for them and supports their desire for places for socialising, activity, recreation and aesthetics.

With the current trend whereby children and young people risk losing everyday nature contact, school ground greenery could have special value for health and well-being (Dyment & Bell, 2008). For adolescents, who often prefer settings with green elements if also meeting their other preferences (Owens & McKinnon 2009), as confirmed by this study, adaptation to their perspectives might be particularly valuable. Having secondary school students, staff and other actors participate in work to improve school grounds might be beneficial (Rickinson and Sanders, 2005; Christiansen et al., 2017), particularly in light of the well-founded requests for improvements made by the participants in this study and the differences found in culture of school ground use between schools and individuals.

School ground design

How the size and content are spatially designed, or given form, in school grounds appears to be critically important for their usefulness to secondary school students. The integration of structures and equipment for social and physical activities in direct connection with vegetation (trees, shrubs, lawns, flowers) and the creation of several pleasant and varied settings with multiple functions (sports, sitting or hanging out, experiencing nature, calming down) might increase use of school grounds by this age group. Despite the wish from several students, mainly girls, for seating, it appears that a well-designed setting that allows both sitting and other functions, including vegetation and structures that can be considered multi-functional, can also be activating. A design with secluded places suitable for hanging out was

important for girls, as also found by Pawlowski et al. (2014), while in this study also boys requested such social places, but more for meeting. The integrated, multi-functional school ground designs that are valued already by children around the age of 11 (Jansson et al., 2014) appear even more important for secondary school students.

Several of the differences in experiences and uses between the three schools' grounds can be connected to their physical properties and qualities, as found by Dymont & Bell (2007). The conditions for activity, as experienced by the students, might be the foundation for use. At the town school, where the grounds were experienced as empty with a lack of integrated settings, the reported use was also the lowest. Lack of possibilities for various activities, determined by different barriers to use, is therefore a main obstacle for school ground use among secondary school students, as also pointed out by Pawlowski et al. (2014). School ground designs that adapt to adolescents' perspectives might be valuable in creating those possibilities.

Method discussion, limitations and future studies

The triangulation of different methods in this study provided a fuller picture of the children's perspectives than each method alone (Cele, 2006), mainly as the methods followed each other and added more understanding. The walking interviews revealed more context-bound information, as the students discussed with each other and related to the setting by showing places they talked about. Cele (2005) described an insight into children's experiences as the method's strength. However, the students aged 14-15 did not engage with the environment during the walking interviews as much as described for younger children as informants (Cele, 2005); thus the walking interviews became less of 'observations'.

The research design used could be improved, including the design of the questionnaire and interviews. Among the limitations of the study were the limited number of cases and missing information on gender in one of the cases studied. Also, the dependence on the time allowed by the schools, making the individual interviews shorter than planned, was problematic. The individual interviews therefore served mainly as an introduction, later continued in the walking interviews.

This study provided some insights, but more studies are needed to further understand how outdoor school areas can better match the needs and preferences of secondary school students. This study focused on existing and green school grounds, settings which might not be very common. For a true maximum variation of cases (Flyvbjerg, 2006), school grounds of more limited sizes and qualities could be included. Future studies could use OPEC (Mårtensson, 2013) as a framework to further examine size, content and design. Design aspects, the use of school grounds that are particularly limited in size and in green space and the qualities students find both indoors and outdoors, i.e. why so many spend recess indoors and what motivates them to go outdoors, are of particular interest to explore. More quantitative or mixed-methods approaches could be used to test and further develop the findings from this study.

Conclusions

Well-designed, sufficiently large school grounds with a number of settings of varied content, with greenery, sport facilities and multifunctional seats and equipment, are appreciated and important for students in secondary school. To increase the usefulness of school grounds for both girls and boys in this age group, there is a need for multifunctional structures supporting socialising (and solitude) and various activities in settings that are integrated and inviting, preferably green and aesthetically pleasing, and easily accessed. The results from this study show that school grounds are important to children in secondary school, as their everyday places for outdoor activities and rest, but that students despite this often chose to be indoors, particularly in less agreeable weather and in school grounds that are limited in size, lacking a varied and multifunctional content or where the design is not integrating elements into various, useful settings. School grounds designed to better suit secondary students' perspectives can increasingly support and encourage their outdoor activities and health.

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