

# Physical Activity and Sport Facility Mapping in Latvian Region Inclusive and Non-Inclusive School-Yards

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## Abstract

**Problem Statement.** School-yard is a place, where to develop physically, mentally and socially, spend recess time, have PE classes, do sports, relax and socialize. However, the landscape and facilities of school-yards usually lack a lot of affordances for the above-mentioned aims.

**Approach.** The goal of the study is to explore the situation in different regions of the Republic of Latvia, considering both inclusive and non-inclusive schoolyards.

**Methods.** The research combines qualitative and quantitative methods. It is based on validated schoolyard facility registration form, worked out on the basis of Gibson's theory of affordances for landscape design to be physically active and do sports. Schoolyards and facilities were described and identified through orthophoto maps, taking Google maps as source. Mapping results were processed by illustrator tool Molbert.

The schoolyard registration form was divided into three parts, which on condition were named large, medium and small facilities. Facility scale reliability was the basis for further descriptive and conclusive statistical analysis about the distribution of facilities in order to find the most widespread and scarcely met ones. The quality of school-yards could be increased by raising the awareness about increasing the variety of school-yard facilities of all sizes, not disregarding pupils with special needs.

**Subjects.** The registration form about the facilities on a voluntary basis in Year 2023 was filled in by 30 Year 1 students of a Latvian HEI, coming from different regions of Latvia.

**Results.** A wide variety of sports activities are available in the capital city of Riga and Zemgale, where school sports fields have been modernized. These fields have both basketball courts and soccer fields, as well as bmx tracks and fields for various sports activities. There are soccer fields in the school-yards of Kurzeme, Vidzeme and Latgale schools, but the areas are small and await improvement. School-yard inclusiveness checking showed that only 20% of them have affordances for pupils with special needs.

**Discussion and conclusions.** Pupils can practice in the school-yards sports they love most – the ball games, but there is a room for improvement to increase schoolyard variety, especially as to fitness and other facilities. Especially scarce are affordances for pupils with special needs.

**Keywords:** school-yard mapping, facilities in school-yards, physical activity, sports, physical education

## Introduction

As Eurobarometer testified, in 2018, (Special Eurobarometer 472 Sport and physical activity, 2018) young people in EU were more likely to do sports in formal settings, less common was doing sports in a park or outdoors. Most often they practiced at sport schools, but also in the parks, woods, at the seaside and at home. The option of staying in or going to the schoolyard was not offered.

The latest Eurobarometer Report (Special Eurobarometer 472, 2024) , on the contrary, showed that EU citizens prefer doing sports or physical activity (PA) in parks and outdoors – 47% in LV, and 53% in the EU; on the way between school and home, a.o.places in between – 24% in LV, and 20%, in the EU, other places are less popular both among Latvian and EU respondents. The option “at my schoolyard” – a space with sports areas available for the pupils to play, socialize, and be physically active during recess and lessons, and after school to do sports there – again is not even offered.

However, the school has been identified as a key arena for promoting more active lifestyles. (Mourço-Carvalho and Coelho 2010). In the Recommendations (Rutkauskaite et. al., 2021a; 2021b) is reminded that for many pupils school playtime is the most active part of their day, therefore, schoolyard and school playtime are vitally important to pupils for their fun and relaxation, health and wellbeing. School playgrounds could help in fulfilling their daily needs and interests.

There are many factors to consider before planning schoolyards (Rutkauskaite et. al., 2021a; 2021b): the interests, needs and age of pupils; the use in different seasons; the factors that support mental, social, emotional, and physical well-being of all pupils not only the sporty or active ones. The possibilities in schoolyards could support the life skills. Activities in the schoolyard could be part of school day activities in free time (recess), during the study process (physical education, and other subject lessons), and after school time.

The quality of schoolyards places may predict the level and diversity of play (Fjortoft, 2001, 2004), the most creative games (Fjortoft, 2001) and higher rates of physical activity

(Boldemann et al., 2005). In the playgrounds of schoolyards in less structured environments can be promoted moderate physical activity through free play (Pate et al., 1996). Younger pupils can get the exercise they need by accepting the schoolyard as a playscape. Having access to a natural landscape, children showed an increase in motor skills (Fjørtoft, 2004). However, the research showed that young pupils not only did not get enough time for play and physical activity during the school day, and also that their schoolyards did not provide appropriate environments to promote play and physical activity.

A list of studies emphasizes the importance of the quality of schoolyards, facilities and materials used to activate pupil motor skills and physical development (Dudley, 2015; Hamer et al., 2017, Rutkauskaite et al., 2021). Schoolyards including free space, topography and vegetation have a positive effect on pupil physical activity during recess (Bell & Dymont, 2006; Fjørtoft et al., 2009; Pagels et al., 2014), stimulate physically active play more than inbuilt environment (Bates et al., 2018) and increase the variety of games played by pupils of all ages and both genders (Dymont et al., 2009).

Pawlowski et al. (2019) addressed girl needs during recess, suggesting a range of built environment actions, providing a variety of built environment, facilities, surfaces, and vegetation in the schoolyard, emphasizing such fixed facilities such as gymnastics equipment, obstacle courses, dancing scenes, trampolines and to facilitate non-competitive play and social games, as well as unfixed play equipment such as skipping ropes and balls. Finally, there should be large and small delimited areas throughout the schoolyard. Investigating Swedish pre-school yard upgrading, the conclusion was drawn that children themselves also should be involved in their design (Almers et al., 2020).

Vasickova, Neuls & Svozil (2015) investigated popularity of school Physical Education, referring to research in Canada by Luke & Sinclair (1991), who have identified five main determinants of attitude toward school Physical Education, which regardless gender are curriculum content, teacher behaviour, class atmosphere, student self-perceptions, and facilities.

The type of schoolyards' equipment is a risk factor in obesity prevalence. The lowest prevalence of obesity was observed in schools with more equipment; therefore, the authors conclude that the most important is not the quantity and type of equipment, but its diversity (Mourço-Carvalho & Coelho, 2010).

The school yard should also be adapted for pupils with various disabilities. Additionally, the area may be equipped with a corner of the senses, e.g., touching the wall of various surfaces with (closed or covered eyes), special stands with signs of the language for the deaf people, an island where various tasks should be performed with just one hand or moving on one leg, etc. (Rutkauskaite, 2024, p.16):

Our scientific research results demonstrated that schoolyard design and facilities are characterised by flat terrain covered mostly with asphalt and artificial cover and dominated by sports fields of international standards, which are of limited use apart from physical education lessons. There is some open space with grass, and often also a parking space. Pupils, however, prefer vegetation, comfort, and versatility in schoolyards. (Rutkauskaite, 2024, p.8).

In the Republic of Latvia there are regulations stating that the territory of the institution shall have a sports area corresponding to the specific nature of the institution. It is also mentioned that in the case the sports areas cannot be established in the institution, the institution has to ensure the possibility to acquire the program of sports study subject somewhere else (Republic of Latvia CR No. 610, 2002). A note should be made that by sports study subject in Latvia is understood the subject of Physical Education.

In all Baltic countries, including Latvia, pupils are not allowed to go out during recess (Rutkauskaite et al., 2021). Curricular Policy for outdoor use in play and learning in Latvia has a recommendation to focus on sport-related outdoor activities and emphasizes the difference between qualities of well-being outdoors and indoors (Sports – VISC, 2021).

Pupil poll (Rutkauskaite et al., 2021) about PA during the recess, showed that pupils in 3 Baltic and 3 Nordic countries like to play ballgames, climb, and just walk and talk. Although the majority of the 6 countries mentioned in general liked their school yards, they also expressed the following suggestions: to erect trampoline, provide more possibilities for climbing – climbing walls and ladders, be able to ride a skateboard, have more facilities for fitness training, for example, bars for strength training, as well as have a dancing area and more benches.

Jakovleva & Rudzinska (2017) research about basic school pupil physical activity and sports habits revealed most popular sports in a Latvian mainstream secondary school. These were team games (basketball, volleyball), winter sports (skiing and snowboarding), fitness sports (running) and strength sports (gym workout) and gymnastics.

In this article, we focused on pupil affordances to do sports, have physical education and engage in physical activity in their nearest neighbourhood – schoolyards, situated in different regions of the Republic of Latvia by registering different scale facilities and investigating the regularities of their distribution, not disregarding the pupils with special needs and their inclusion in the above-mentioned activities.

There were three tasks in the research:

1. To map a schoolyard in the capital of Latvia and in four its regions.
2. To register different size schoolyard facilities and investigate the regularities of their distribution.
3. To check the inclusiveness of the school-yards.

## Materials and Methods

The research is a mixed one, combining qualitative and quantitative methods. It is based on previously validated schoolyard facility registration form (Kristiansand Municipality and University of Agder, 2006), elaborated on the basis of Gibson's theory of affordances (Gibson, 1986) about landscape design to be physically active and do sports.

**Schoolyard mapping.** Schoolyards and facilities were described and identified through orthophoto maps, taking Google maps as source. Mapping results were processed by illustrator tool Molbert. Based on these registrations, the schoolyards could be later evaluated

as to whether they had constructions, apparatus, and nature in the schoolyard that stimulate PA and different sports.

**Subjects.** The registration form about the facilities on a voluntary basis in Year 2023 was filled in by 30 Year 1 students of a Latvian HEI, coming from different regions of Latvia. For answers regarding the presence or non-presence of the facilities was used dichotomous scale – Yes/No. The students come from all regions of Latvia; therefore, we chose one school from one region and incorporated it in the article.

The above-mentioned schoolyard registration form was employed, and to make it more transparent and easier to analyse, it was divided into 3 parts, which on condition were named large, medium and small facilities. In the group of large facilities fell first 9 facilities of the questionnaire: soccer pitch, basketball court and separately also basketball basket, volleyball court, touchball court, traditional games court, handball court, rugby court and landhockey field. In the group of medium facilities were included 10 items – badminton court, mini-tennis court, squash field, skate area, table tennis table, BMX track, 60 m run track, long jump sector, sector for ball throw, sector for shot put. In the third group were included the following 9 items – steeplechase, swings, sandpit, climbing wall, amphitheatre, area for skiing, area for yoga, area for fitness, area for orienteering. In the questionnaire there is also such an item as bob-slop, but we have excluded it, since in no one of the researched schools it was found.

The reliability of the scale of each facility group was determined from Cronbach's Alpha values. According to Pallant, reliability is satisfactory, if it is over 0.7. However, the values over 0.8 are more advisable (Pallant, 2007).

In the case the reliability was satisfactory, descriptive and conclusive statistical analysis were carried out to find the most and least popular facilities in each of the three groups by determining their means values, standard deviations and in one case also variances. Conclusive statistical analysis was employed to find statistically significant differences in facility distribution. If the data do not follow normal distribution, Wilcoxon test was used to find the differences in facility distribution. The significance level of the differences was set at or below the value of 0.05.

To solve the last Task, we asked the students to reflect in a free form about the inclusion aspect of their school-yards. The answers were then analysed with qualitative method, finding the key words and determining their frequency.

## Results

### Task 1. Schoolyard mapping

Figure 1 presents the results of mapping. Above the maps is featured the legend, including nature, grass, sand, asphalt, artificial grass, as well as fence. From possible facilities for different physical activities and sports are featured basketball courts, other sports games, soccer and volleyball courts, areas for winter and urban sports activities, as well as an urban classroom.

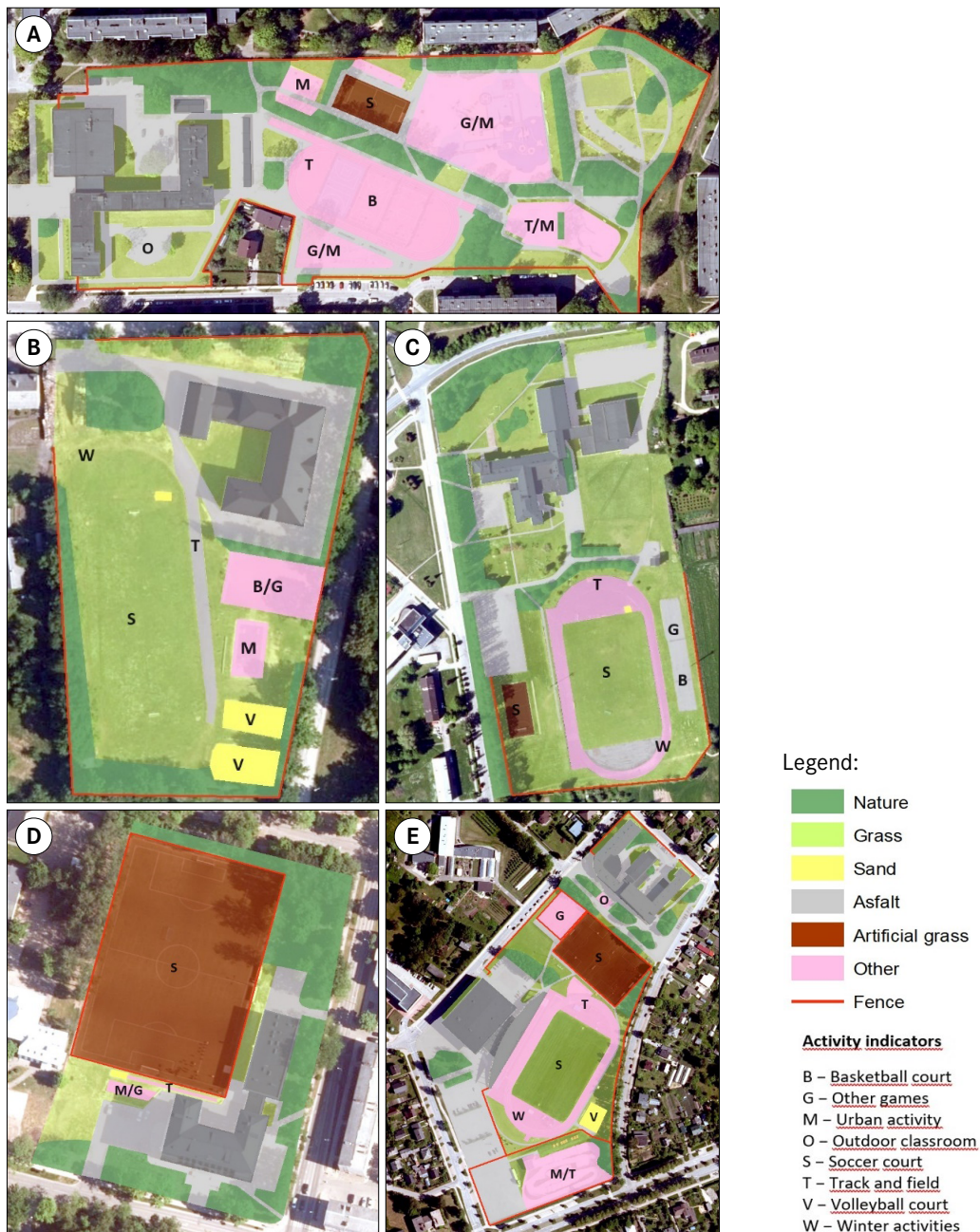


Figure 1. Results of mapping

**A** – school in Riga – the capital city of Latvia

**B** – a school in Kurzeme district  
**C** – a School in Vidzeme district

**D** – a school in Latgale district  
**E** – a school in Zemgale district

In Figure 1A the territory is dominated by artificial grass, asphalt, just a little territory is left for nature. The school in Kurzeme district has the largest area for nature, grass and sand, there is no artificial grass area. The same about the school in Vidzeme district, but there is no sand area. Figure 1D features the largest artificial grass area, belonging to a school in Latgale region, and Figure 1E, shows a school-yard in Zemgale region with a remarkably smaller artificial grass area.

A wide variety of sports activities are available in the capital city of Riga and Zemgale, where school sports fields have been modernized. These fields have both basketball courts and soccer fields, as well as bmx tracks and fields for various sports activities. There are soccer fields in the school-yards of Kurzeme, Vidzeme and Latgale schools, but the areas are small and await improvement.

## **Task 2. Facility recordings**

Descriptive and conclusive statistical analysis of their distribution.

### **Group 1. Large facilities**

Large facilities comprised soccer pitch, basketball court and separately also basketball basket, volleyball court, touchball court, traditional games court, handball court, rugby court and landhockey field.

Reliability of large-scale facilities (Cronbach's Alpha = 0.63,  $n = 9$ ,  $N = 26$ ) is slightly below satisfactory level. It can be increased by adding some more facilities or increasing the number of respondents. As well as, we have noticed that respondents are not fully aware of the meaning of the term touchball. They tend to understand it as folk ball.

Descriptive statistics for 1st group of facilities is summarized in Table 1.

Table 1 shows that most frequent in the group are soccer fields and volleyball and basketball courts, as well as basketball baskets. Handball courts, landhockey fields, rugby courts and traditional games areas are found considerably less.

For better visualization, the absolute numbers of facilities are shown in Figure 2.

It was found that not all of the items have normal distribution, therefore Wilcoxon test was used to find the differences in facility distribution. Conclusive statistical analysis with the help of Wilcoxon test is summarized in Table 2.

Wilcoxon test (Table 2) showed that there is a tendency that soccer fields are more than rugby courts and landhockey fields, and basketball courts and basketball baskets are more than handball courts, and finally – soccer fields more than handball courts ( $z = -3.44$ ; Sig.(2-tailed = 0.001)).

The conclusion can be drawn that in order to increase the variety of large facilities in different region schoolyards, handball courts, landhockey fields, rugby courts and traditional games areas should be erected separately, or in combination with other large scale facilities.

### **Group 2. Medium size facilities**

Medium size facilities covered 10 items from the Questionnaire – badminton court, mini-tennis court, squash field, skate area, table tennis table, BMX track, 60 m run track, long jump sector, sector for ball throw, sector for shot put.

Table 1

**Characteristics of large scale facilities**

Facilities	Mean	St. dev.
rugby_court	0.04	0.20
traditional_games	0.21	0.41
landhockey	0.13	0.34
Volleyball_court	0.71	0.46
Basketball_basket	0.88	0.34
Basketball_court	0.83	0.38
Soccer_field	0.79	0.41
handball_cour	0.21	0.41
touchball court	0.13	0.34

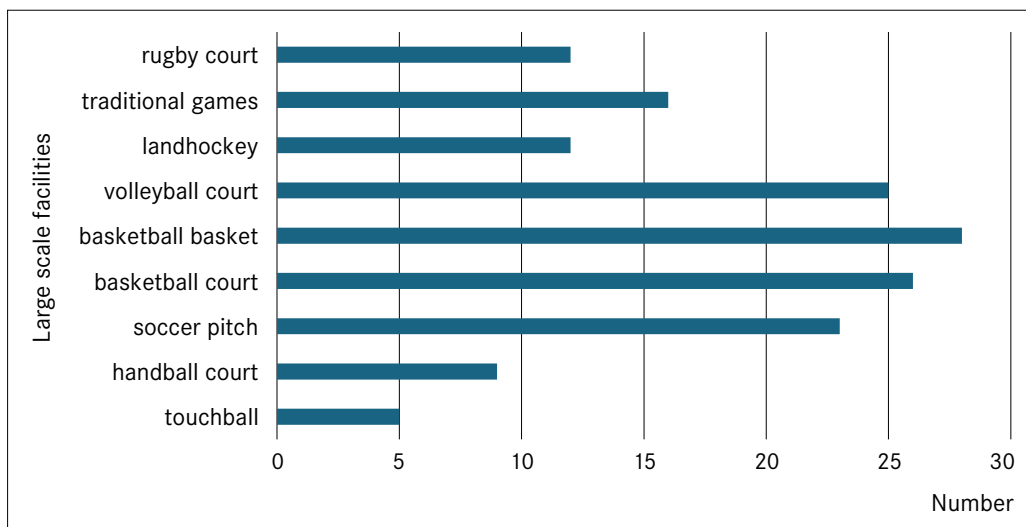


Figure 2. Numbers of large size facilities

Table 2

**Wilcoxon test for large scale facility pair differences**

Pairs of facilities	Z	Asymp. Sig.
soccer_field - handball_court	-3.44	0.001
basketball_court - handball_court	-4.00	0.000
basketball_basket - handball_court	-3.90	0.000
volleyball_court - handball_court	-3.21	0.001
soccer_field - landhockey	-4.24	0.000
soccer_field - rugby_court	-4.15	0.000



Table 3

**Characteristics of medium size facilities**

Facilities	Mean	St. dev.
sector_shot_put	0.48	0.51
sector_ball	0.48	0.51
long_jump	0.55	0.51
60_m run	0.66	0.48
BMX_track	0.14	0.35
table_tennis	0.34	0.48
skate_area	0.28	0.46
squash_field	0.03	0.19
mini_tennis	0.07	0.26
badm_court	0.31	0.47

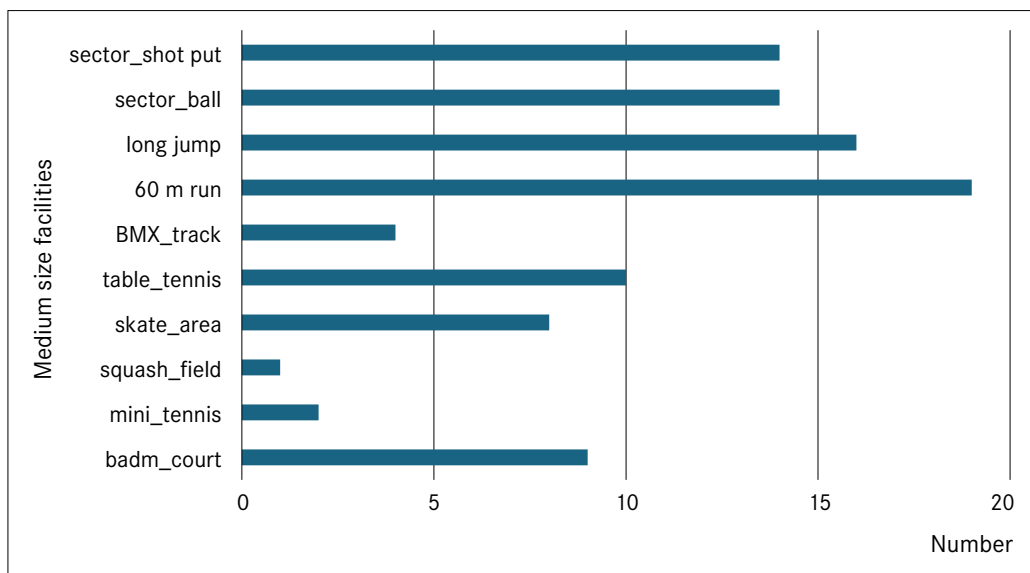


Figure 3. Number of medium-size facilities

Table 4

**Wilcoxon test for medium scale facility pair differences**

Pairs of facilities	Z	Asymp. Sig. (2-tailed)
squash_field-badm_court	-2.83	0.005
sixty_m-BMX_track	-3.64	0.000

First was determined the reliability of the scale. It was 0.75 ( $n = 10, N = 29$ ). According to Pallant, the value is completely acceptable for statistical analysis.

Further was carried out descriptive statistical analysis, the results of which are summarized in Table 3.

Table 3 shows that most frequent in the group are 60 m running tracks, long jump sectors, as well as sectors for shot put and ball throw. Squash fields, mini tennis courts and BMX tracks are met rarely.

For better visualization, the absolute numbers of middle-size facilities are shown in Figure 3.

Figure 3 shows that from medium-size facilities dominates the track for 60 m run, also sectors for shot put, ball throwing and long jump are in more than a half of the investigated schoolyards. Exactly half of the schools possess tables for playing tennis, slightly less for playing badminton and a skate area. The number of squash field and BMX tracks should be increased to increase the variety of schoolyard middle size facilities.

The results of conclusive statistical analysis, carried out with the help of a Wilcoxon test, are summarized in Table 4.

Wilcoxon test (Table 4) showed the following statistically significant results – badminton courts are more than squash fields ( $z = -2.83$ ; Sig.(2-tailed = 0.005)) and 60 m tracks are more than BMX tracks ( $z = -3.64$ ; Sig.(2-tailed = 0.00)).

### **Group 3. Small size facilities**

In the group are included the following facilities – area for steeplechase, swings, sandpit, climbing wall, amphitheatre, area for skiing, area for yoga, area for fitness, area for orienteering.

Reliability of the group is acceptable (0.67), but for further analysis it should be increased.

Descriptive statistics for small size facilities is presented in Table 5.

Descriptive statistics analysis shows that the highest occurrence has sandpits and orienteering areas. Amphitheatres have the lowest occurrence. Yoga and fitness areas in schoolyards are also scarce. For better visualization, the absolute numbers of facilities are shown in Figure 4.

Figure 4 conveys that no schoolyard has a bob slope. Most common is a sandpit. Especially scarce are amphitheatres. Sandpits prevail, but the result has to be treated with caution, since they can be of two kinds – for young pupil play, and as for landing in long jump. Most probably, the respondents have recorded both of them, and the number of each of them could be lower.

Conclusive statistical analysis with Smirnov-Kolmogorov test showed that there is no normal distribution for values of orienteering, swings, area for skiing and sandpit (Sig. < 0.05). Therefore, we used Wilcoxon test to find small size facility pair differences.

Wilcoxon Signed Ranks Test, results summarized in Table 6, proved (Sig. < 0.05) that sandpits in the schoolyards are more than amphitheatres, fitness areas, climbing walls and steeplechase facilities.

Table 5

**Characteristics of small size facilities**

Descriptive statistics for facilities	N, valid	Mean	St. dev.
steeplechase	28	0.11	0.32
swings	28	0.29	0.46
sandpit	28	0.54	0.51
climbing_wall	28	0.18	0.39
amphitheatre	28	0.04	0.19
area_skiing	28	0.29	0.46
yoga	28	0.11	0.32
fitness	28	0.11	0.32
orienteering	28	0.32	0.48

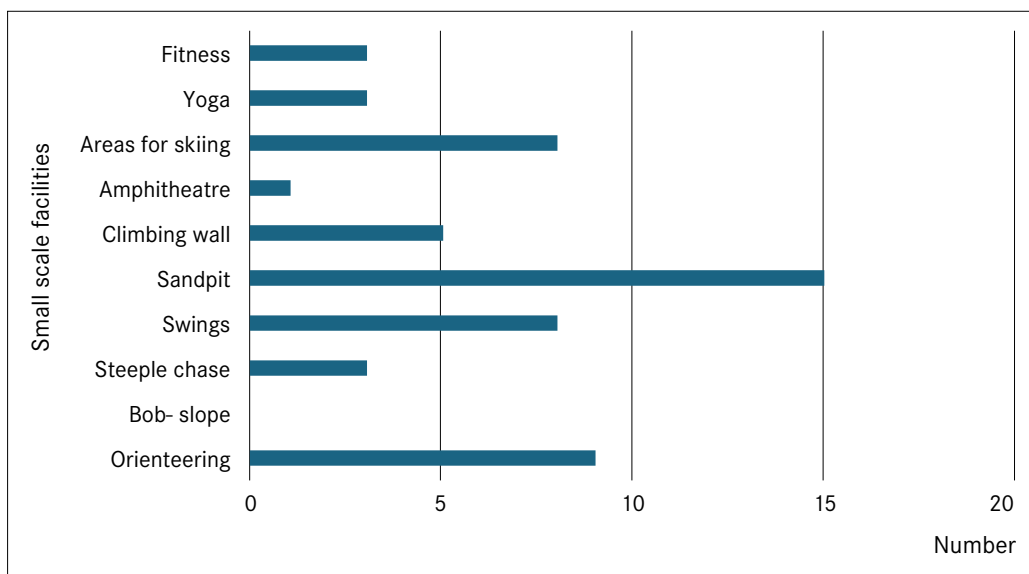


Figure 4. Number of small-size facilities

Table 6

**Wilcoxon test for small size facility distribution pair differences**

Pairs of facilities	Z	Asymp. Sig. (2-tailed)
amphi-sandpit	-3.74	0.00
fitness-sandpit	-3.46	0.00
climbing_wall-sandpit	-2.89	0.00
steeplechase-sandpit	-3.46	0.00

### Task 3. Inclusion

To check the inclusion of schoolyards, we checked the affordances of the schoolyards to do sports and engage in physical activity for local community in general, and for pupils with special needs in particular.

The students were asked to reflect on the question in the form of a free text. Further we found the key words and identified inclusion categories.

The results from qualitative, reflected in Table 7, are as follows: only 6 people from 30 have mentioned affordances for pupils with special needs. In 2 schoolyards it is possible to get into school, in 3 – possible to get around in a wheelchair, in 2 schoolyards there is a hope – they have started to build affordances for pupils with special needs to get around in a wheelchair.

Table 7

#### Qualitative analysis for pupil inclusion in their school yards

No.	Respondents' text	Key words	Category
1.	To enter the school we have a special staircase for the disabled.	Special staircase	get into school
2.	There is place, where older people can sit, for example, read books. There is asphalt, where people in wheelchairs can freely move.	Benches to sit Asphalt to move around in wheelchairs	sit, move around
3.	There were no special facilities for handicapped people, but they could simply be in the nature, sit on benches and use paths or trails if possible.	Sit on benches and use paths or trails if possible	sit, move around
4.	Also thought of people with disabilities and mothers. The entrance is built to allow wheelchair people to enter school freely.	Entrance is built to allow wheelchair people to enter school freely.	get into school
5.	My school has just started to build paths and roads to help disabled people.	just started to build paths and roads to help disabled people	just started to build affordances to move around
6.	For handicapped people it is easy to move around if you are in a wheelchair.	it is easy to move around if you are in a wheelchair	affordances to move around

### Conclusions

From mapping can be concluded that the territory of a school-yard in the capital city of Latvia is dominated by artificial grass, asphalt and just a little territory is left for nature.

A wide variety of sports activities are available in the capital city of Riga and Zemgale, where school sports fields have been modernized. These fields have both basketball courts and soccer fields, as well as bmx tracks and fields for various sports activities. There are

soccer fields in the school-yards of Kurzeme, Vidzeme and Latgale schools, but the areas are small and await improvement.

Different size facility distribution analysis revealed that in the first group most there is a tendency that soccer pitches are more than rugby courts and landhockey fields, and basketball courts and basketball baskets are more than handball courts, and finally – soccer fields more than handball courts. In general, in the group most frequent are soccer fields and volleyball and basketball courts, as well as basketball baskets. Handball courts, landhockey fields, rugby courts and traditional games areas are found considerably less. To increase the variety of facilities found in school-yards, they might be erected.

In the second group badminton courts tend to be more than squash fields and 60 m tracks – more than BMX tracks. In general, in the group dominates the track for 60 m run, also sectors for shot put, ball throwing and long jump are in more than a half of the investigated schoolyards. Half of the schools possess tables for playing tennis, slightly less for playing badminton and a skate area. The number of squash field and BMX tracks should be increased to increase the variety of schoolyard middle size facilities.

Considering third group of facilities, sandpits tended to be more than amphitheatres, fitness areas, climbing walls and steeplechase areas. Although bobsleigh in Latvia is rather popular, there were no bob slopes. This fact, in our opinion, is determined by the topography of schoolyards – their surfaces are flat, and so there is no place for sliding down.

In general, most common is a sandpit, but considering that there are 2 kinds of them – for long jump and just for play, the number of each of them may be lower. Yoga and fitness areas in schoolyards are also scarce. Pupil polls in Baltic and Nordic countries and other sources, mentioned in the introduction show that pupils would like to have more affordances for fitness and even for dance, but researched schools are reluctant to offer them. Especially scarce are amphitheatres. In Nordic countries they are used for student performances. Recently theater classes have been introduced in Latvian schools, so the presence of this facility might be useful.

Comparing the obtained results with the previous ones, can be concluded that pupils can practice in the schoolyards sports they love most – the ball games, but there is a room for improvement to increase schoolyard variety, especially as to fitness facilities, making schoolyards attractive, useful place for not only doing sports or physical education and engaging in physical activity, but also socializing and relaxing.

Finally, checking inclusiveness of the schoolyards, was found that only in 20% of cases the respondents have mentioned special affordances for pupils with special needs. In 7% of schoolyards it is possible to get into school, in 10% – move around in a wheelchair, in 7% of schoolyards there is a hope – they have started to build affordances for pupils with special needs to get around in a wheelchair.

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