ENVIRONMENTAL EDUCATIONAL POTENTIALS ON SCHOOL GROUNDS IN BUDAPEST

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Abstract
As nature and greenspaces in urban areas are agreed to enhance children's appreciation towards nature and so the purposes of environmental education, it is of high importance to create spaces in and around schools that allow students to connect to nature on a daily basis. The aim of the study was to analyse functions and other components supporting environmental education appear in the open spaces of school grounds in Budapest, and to understand the main characteristics of school grounds with the highest potential in environmental education. The study points out that the presence of environmental educational functions often depends on the size, urban context and location of the school grounds, however the curriculum of the school does not necessarily influence its open spaces, while the presence of motivated and engaged teachers does. The study reveals environmental educational functions do exist in school grounds of primary schools in Budapest, however they play only secondary role behind active movement and play functions. The schools with the best potentials in environmental education are without doubt the ones situated on large plots in the suburban zone, mostly with a high proportion of green spaces in and around the school grounds.

Keywords: landscape architecture, environmental learning, urban environment, nature exposure, children, childhood

1. Introduction

Childhood exposure to nature is essential for many reasons, as – besides many other benefits –it can result in higher environmental awareness as an adult (Broom 2017), contributing to the long-term success of environmental education. As more and more children live in urban environments, there is an increasing importance of creating green areas in cities where they are given the chance to connect to nature. In many cases school grounds are almost the only places where urban children can be exposed to nature on a daily basis (Rivkin 1995), thus the proper design of school grounds has become an important task for landscape architects, to potentially contribute to the wellbeing of children as well as to the success of environmental educational activities of schools.

However, existing literature and research about school grounds mostly deal with its effect on and use in play and physical activities (Tranter – Malone 2004; Bell – Dyment 2006; Dyment – Bell, 2008; Dyment et al. 2009; Fjørtoft et al. 2009; Cosco et al. 2010; Fishman 2001; Mårtensson et al. 2014; Marouf et al. 2015), and learning processes and motivation (Malone – Tranter 2003a, 2003b; Tranter – Malone 2004; Atmodiwirjo 2013; Ali et al. 2015). There are only few studies focusing on the effects of school grounds on children's knowledge about (Harvey 1989) and appreciation of nature

(Ali et al. 2015).

There are existing international guidelines (e.g. White – Stoecklin 1998; Evergreen 2002; White 2004; Dyment 2005; Bell – Dyment 2006; Danks 2010; Wolf et al. 2014) about the design of ecological school grounds and/or naturalized play areas but they have not been adapted to Hungarian context yet, nor have been analysed if Hungarian school grounds meet the suggestions of these guidelines. Hungarian literature do exist about designing ecological schools (from a pedagogic point of view) but they have little focus on the outdoor areas (Réti 2011).

Thus the present study focuses on school grounds of primary schools in Budapest. The aim is to analyse how environmental educational goals - both direct (e.g. school gardening, outdoor classes) and indirect (e.g. learning by playing, being in nature) - appear in the use and design of school grounds. The research studies how schools participate in different environmental educational programs, how green areas are used to support them and whether there are significant differences between the open spaces of different schools.

2. Materials and Methods

A fieldwork was carried out in 16 schools, which was based on the data obtained from official databases of schools (data regarding to plot areas, year of construction, participation in environmental educational programs) and an online survey about their use of the open space and other environmental education activities. The studied databases were the following: the official database of primary schools operating in Budapest, obtained from the Köznevelés Információs Rendszere (Information System of Public Education), the database of "ecological schools" (i.e. a country-wide program for schools with a strong emphasis on environmental educational in their curriculum), data obtained from Oktatáskutató és Fejlesztő Intézet (Hungarian Institute of Educational Research and Development), the list of

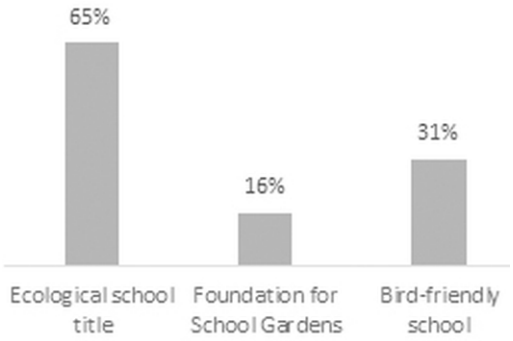

Fig 1. Participation in environmental education programs in surveyed schools

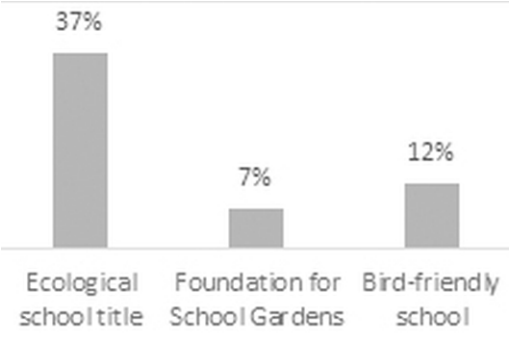

Fig. 2. Participation in environmental education programs in primary schools in Budapest

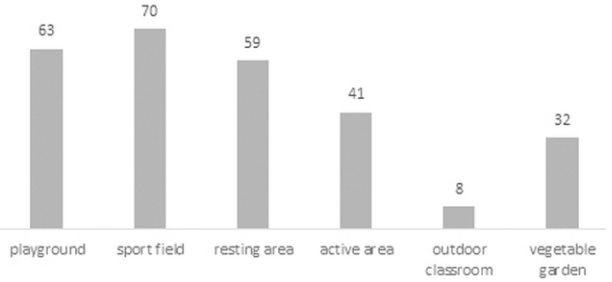

Fig. 3. Open space functions in surveyed schools

schools participating in the program of Iskolakertekért Alapítvány (Foundation for School Gardens), data obtained from their website (Iskolakertekért Alapítvány 2018) and the list of "Bird-friendly schools", list of schools obtained from Magyar Madártani és Természetvédelmi Egyesület (BirdLife Hungary). The mentioned three programs are the main environmental educational programs present in Hungary's public education.

The surveyed schools (77 answers were received) are primary schools in Budapest, which are not operating in the same building with a kindergarten (as this would influence the design of the outdoor areas). Based on the analysed databases and the results of the survey, 16 schools were chosen for further fieldwork, according to different aspects like urban context and location, size of the school ground, and curriculum. All chosen schools are state schools, following the national curriculum, however some schools are "Ecological schools" (vide supra).

To guide the fieldwork and to acquire comparable analysis results an analytical framework was created beforehand. The main areas of the fieldwork were the following: basic data of the school (number of students, year of construction of school building), urban context (location and surrounding building types), plot characteristics (plot area, approximate green space), institutional environmental education (special curriculum, participation in environmental educational programs, activities, etc.), open space functions (environmental education and "naturalized play areas"), vegetation (quantitative and qualitative characteristics), presence of microhabitats. Altogether 59 components were analysed, from which 14 elements were characterised by different data (date, number, percentage or prescriptive quality), and 45 by a binary number (i.e. yes or no).

3. Results

The schools who filled the online survey, participate in environmental educational programs in a significantly higher percentage than all the analysed schools in Budapest (Fig. 1: Participation in environmental educational programs in surveyed schools and Fig. 2: Participation in environmental educational programs in primary schools in Budapest). This suggests that schools participating in some kind of environmental educational program had a higher willingness to fill a questionnaire related to environmental education and school grounds, which might have an effect on the results of the survey.

76 of 77 surveyed schools have a school ground, however one school situated in the inner city has no school ground due to the lack of open spaces, despite of obtaining the "ecological school" title. Based on the question about the most common uses of the school grounds active movement and play are definitely the primary functions in schools: they are present in almost every institution while places for environmental learning such

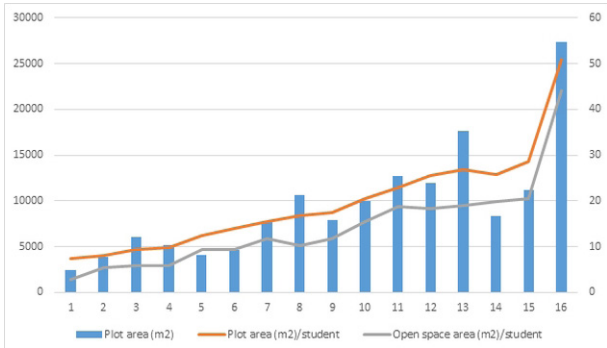

Fig. 4. Plot areas in studied schools

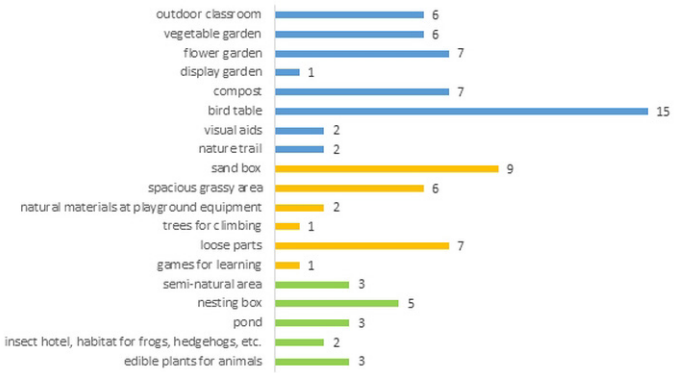

Fig. 5. Participation in environmental educational programs and activities in studied schools

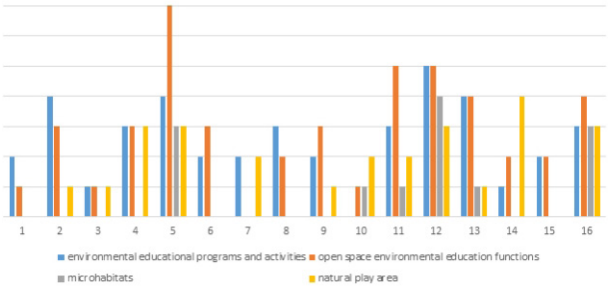

Fig. 6. Environmental educational elements (blue), natural play elements (yellow) and microhabitats (green) on studied school grounds

as school gardens, semi-natural areas or other educational functions are less frequent (Fig. 3: Open space functions in surveyed schools). Open space classrooms are not common, however, according to teachers classes are hold occasionally outdoors as well.

The average plot size in the 16 primary schools that participated in the fieldwork is approximately 9500 m2 which means an average of 19 m2 plot area/student and 14 m2 open space/student. This is below the current standards of 25 m2 plot area/student (Magyar Szabvány 2007), due to the lack of space in the inner city as well as the regulation at the beginning of the 20th century which still defines the open spaces of schools built in that period: in 1905 at least 3 m2 open space/student was required, while in the 1910s this was reduced to as few as 1,5m2 open space/student in the case of Budapest (Klagyivik 2018). Amongst the studied schools, only 6 reach the suggested plot area/student (including the allowed difference of 10 or 20% in certain cases) (Fig. 4: Plot areas in studied schools). All of these schools are situated in the suburban zone.

The participation in environmental education programs and open space related activities were studied as well as the institutional characteristics of environmental education (Fig. 5: Participation in environmental educational programs and activities in studied schools). This includes the participation in different environmental educational programs, such as the Ecological school movement, and the program of the Foundation for School Gardens and Bird friendly schools. Besides these, approximately half of the studied schools organized renovation days when parents, children and teachers work together in the school, including working in the schoolyard, half of them regularly use other green spaces outside the schools or use the school ground

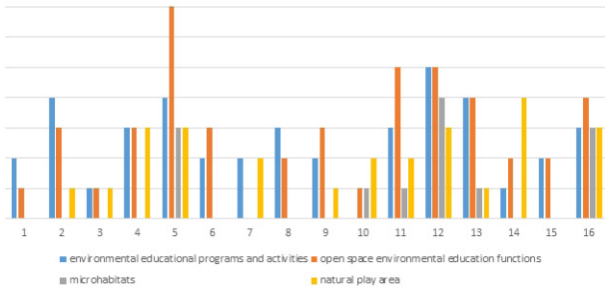

Fig. 7. Proportion of environmental educational activities, open space functions, natural play elements and microhabitats on studied school grounds

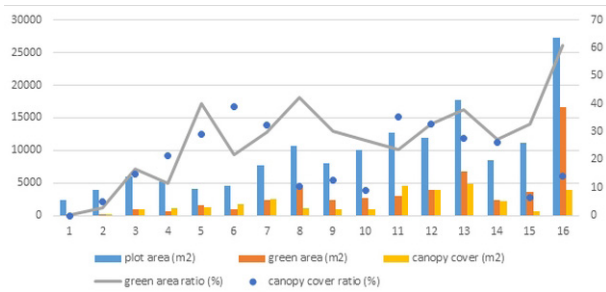

Fig. 8. Quantitative characteristics of vegetation in studied schools

intentionally for environmental educational purposes. The number of open space environmental educational functions and elements are mostly aligned with this. Almost all schools have bird tables, but the rest of the elements appear in less than half of them, as well as natural play elements. The presence of microhabitats are even less common (Fig. 6: Environmental educational elements (blue), natural play elements (yellow) and microhabitats (green) on studied school grounds). It is also visible that microhabitats like bird nests and ponds, or semi-natural areas (such as a hillside woody area or a large meadow with a creek) appear with other, environmental educational elements and natural play elements (trees for climbing, sandbox, loose parts, etc.), and are common in the suburban zone, mostly on plots that reach the standard size. The results of the fieldwork shows that all schools with higher number and quality of environmental educational functions participate in the ecological school program, however not all ecological schools have environmental educational functions on their school grounds (Fig. 7: Proportion of environmental educational activities, open space functions, natural play elements and microhabitats on studied school grounds).

On overall the situation of the vegetation is doubtful in many cases. On one hand, it provides shade, a positive microclimate and contributes to the well-being of kids (Kuo et al. 1998; Wells 2000; Wells – Evans 2003), as well as being a potential subject for observation and studies (Malone – Tranter 2003b). On the other hand, according to teachers, using the vegetation as a teaching material is not always practiced, and the quality of green spaces are not satisfactory in many cases. The green space and canopy cover shows a huge diversion among the studied school grounds, with the average of 27% green spaces and 20% of canopy cover (Fig. 8: Quantitative characteristics of vegetation in studied schools). The highest proportion of green spaces are on the school grounds situated in the suburban zone, while high canopy cover can be found as well in schools built at the beginning of the 20th century, situated in the inner and transitional

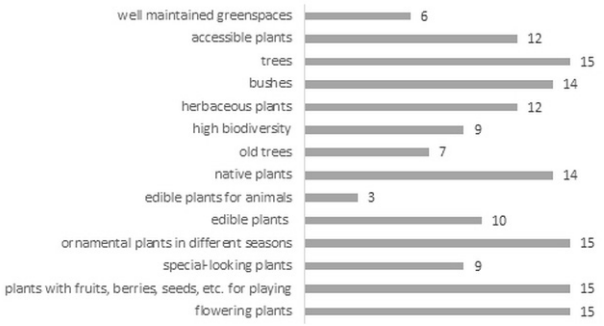

Fig. 9. Qualitative characteristics of vegetation in studied schools

zones of the city. As of the qualitative characteristics, most school grounds have native trees, bushes and flowering plants, either herbaceous or woody plants. However biodiversity can only be considered high in 9 school grounds (compared to the entire sample studied), old trees are only present in 7 (partly due to the fact of some schools having been constructed at the 1980s), and well maintained greenspace can only be found in 6 schools, due to the lack of space and the high number of students which result in the overuse of greenspaces (Fig. 9: Qualitative characteristics of vegetation in studied schools).

4. Discussion

Due to the limited sample size, and the fact that mostly environmentally conscious schools have answered the initial survey, the study cannot be regarded as representative. Aligned with the international trends, many of the studied primary schools in Budapest also focus their attention on environmental education and this emphasis might appear on the school grounds as well, mostly in the form of vegetable gardens. However, no initiatives to naturalize the whole school ground were found and no school grounds primarily centred around environmental educational goals were found either. Compared to the international guidelines and existing good practices, most of the studied schools apply less environmental education functions in their open spaces. Nevertheless, potentials are given in many cases, though often there is a lack of resources, time and/or willingness from the side of the schools and teachers to take initiatives. On the other hand some of the studied schools have large outdoor spaces and semi-natural areas where potentials are well used and a wide variety of environmental educational functions and activities are taken place and as such, can be considered as good practices and leading examples from Budapest.

5. Conclusions

Based on the fieldwork accomplished in the chosen school grounds, the main findings are the following. The presence of environmental educational functions often depends on the size, urban context and location of the school grounds, however the curriculum of the school does not necessarily influence its open spaces, while motivated teachers are inevitable also in terms of this topic. Aligned with the questionnaire, almost all analysed schools have sport grounds and playgrounds, and other active areas which are considered to be places for active movement and play: this reveals that active movement and play is the primary function of school grounds in Budapest. While they are present in almost every institution places for learning such as vegetable gardens can only be found about in half of them. Other elements for environmental learning are present in even smaller numbers. This suggests that environmental education functions are only placed in school grounds with relatively larger extensions. As the minimum plot area

is only given in schools that are situated in the suburban zone, these are the places which can be potentially used for environmental educational goals. This finding was supported by the results of the analysis of open space functions and vegetation as well. Environmental educational functions, natural play elements and microhabitats are mostly present in school grounds in the suburban zone. The highest proportion of green spaces are mostly present in suburban schools as well. It was also noticeable that ecological schools not necessarily have better quality or higher quantity environmental educational functions on their school grounds, instead motivated teachers are of key importance in this topic.

The study points out that while suburban areas have better potentials in creating school grounds for environmental learning, it would be equally important to provide children from denser urban areas with the same opportunities. The results suggests that larger attention should be paid on the inner areas as well, possibly focusing on different solutions requiring less space. It is also notable that the role of teachers is crucial – thus it is inevitable to motive teachers to use the opportunities given by school grounds and to take initiative to change them to be more adequate for environmental educational goals. However the transformation of school grounds could also be supported by regulations and guidelines, and providing funds through different programs or competitions.

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6. References

Ali, S.M. – Rostam, K. – Awang, A.H. (2015): School Landscape Environments in Assisting the Learning Process and in Appreciating the Natural Environment. Procedia - Social and Behavioral Sciences. 202: 189–198.

Atmodiwirjo, P. (2013): School ground as environmental learning resources: Teachers' and pupils' perspectives on its potentials, uses and accessibility. International Electronic Journal of Environmental Education. 3(2): 101-119.

Bell, A.C. – Dyment, J.E. (2006): Grounds for Action: Promoting Physical Activity Through School Ground Greening in Canada, https://www.evergreen.ca/downloads/pdfs/Grounds-For-Action.pdf, 22.09.2017.

Broom, C. (2017): Exploring the Relations Between Childhood Experiences in Nature and Young Adults' Environmental Attitudes and Behaviours. Australian Journal of Environmental Education. 1: 34-47.

Cosco, N.G. – Moore, R.C. – Islam, M.Z. (2010): Behavior Mapping: A Method for Linking Preschool Physical Activity and Outdoor Design. Medicine and Science in Sports and Exercise. 42(3): 513–519.

Danks, S.G. (2010): Asphalt to Ecosystems. New Village Press, Oakland, CA. 276.

Dyment, J.E. (2005): Gaining ground: The power and potential of green school grounds in the Toronto District School Board, http://www.evergreen.ca/en/lg/lg-resources.html, 22.09.2017.

Dyment, J.E. – Bell, A.C. (2008): Grounds for movement: Green school grounds as sites for promoting physical activity. Health Education Research. 23(6): 952–962.

Evergreen (2002): School ground greening: a policy and planning guidebook. Toronto, Evergreen, https://www.evergreen.ca/downloads/pdfs/School-Ground-Greening-Policy-Planning.pdf, 22.09.2017.

Fishman, L. (2001): Child's Play: An empirical study of the relationship between the physical form of schoolyards and children's behavior. http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.205.8569, 25.05.2018

Fjørtoft, I. – Kristoffersen, B. – Sageie, J. (2009): Children in schoolyards: Tracking movement patterns and physical activity in schoolyards using global positioning system and heart rate monitoring. Landscape and Urban Planning. 93(3): 210–217.

Harvey, M. (1989): The Relationship between Children's Experiences with Vegetation on School grounds. Journal of Environmental Education. 21(2): 9-18.

Iskolakertekért Alapvány (2018): Participants of the program of Foundation for School Gardens, http://www.iskolakertekert.hu/images/pictures/Iskolakert_Halozat/Halozat171027.pdf, 15.02.2018

Klagyivik, M. (2018): Oktatási és nevelési intézmények szabadterei Magyarországon 1868 és 1945 között. Dissertation, Szent István University, Gödöllő. 241.

Kuo, F. – Bacaicoa, M. – Sullivan, W. (1998): Transforming Inner-City Landscapes: Trees, Sense of Safety, and Preference. Environment and Behavior. 30: 28-59.

Magyar Szabvány (2007): MSZ 24203-1. Oktatási intézmények tervezési előírásai.

Malone, K. – Tranter, P. (2003a): Children's Environmental Learning and the Use, Design and Management of School grounds. Children, Youth and Environments. 13(2): 87-137.

Malone, K. – Tranter, P. (2003b): School grounds as Sites for Learning: making the most of environmental opportunities. Environmental Education Research. 9(3): 283-305.

Marouf, N. – Johar, S. – Che-Ani, A. – Mohd Tawil, N. (2015): Examining School grounds as a Place for Children's Physical Activity Performance in Tehran. Modern Applied Science. 9(11): 109-118.

Mårtensson, F. – Jansson, M. – Johansson, M. – Raustorp, A. – Kylin, M. – Boldemann, C. (2014): The role of greenery for physical activity play at school grounds. Urban Forestry and Urban Greening. 13(1): 103–113.

Réti M (eds) (2011) Kívül-belül jó iskola. Tanító terek. Oktatáskutató és Fejlesztő Intézet. Budapest. 240.

Tranter, P.J. – Malone, K. (2004): Geographies of environmental learning: An exploration of children's use of school grounds. Children's Geographies. 2(1): 131–155.

Rivkin, M.S. (1995): The great outdoors: Restoring children's rights to play outside. National Association for the Education of Young Children. Washington, DC. 119.

Wells, N.M. (2000): At Home with Nature: Effects of "Greenness" on Children's Cognitive Functioning. Environment and Behavior. 6: 775-795.

Wells, N.M. – Evans, W. (2003): Nearby Nature: A Buffer of Life Stress Among Rural Children. Environment and Behavior. 35(3): 311-330.

White, R. (2004): Young Children's Relationship with Nature: Its Importance to Children's Development and the Earth's Future. White Hutchinson Leisure and Learning Group, http://www.childrenandnature.org/uploads/White_YoungChildren.pdf, 25.10.2017.

White, R. – Stoecklin, V. (1998): Children's Outdoor Play and Learning Environments: Returning to Nature. White Hutchinson Leisure and Learning Group, www.whitehutchinson.com/children/articles/outdoor.shtml, 25.10.2017.

Wolf, U. – Tiedtke-Klugow, A. – Dietzen, M. (2014): Advisory service for the ecological, child-friendly design of school yards and kindergarten. Grün macht Schule,

http://schoolyard-diversity-berlin2017.de/CMS/wp-content/uploads/2017/02/Imagebroschuere_Gruen_macht_Schule-english.pdf , 27.10.2017.