TRANSFORMING PRIMARY EDUCATION AND PEDAGOGY – THE CASE OF SCHOOL GARDENS IN DENMARK

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Abstract
School gardens spreading across Europe can make an important contribution to the transformation of primary education. The dissemination of school gardens in Denmark is a result of trends in urban farming and a farm-to-table and gastronomy focus in the country combined with a recent school reform. It is supported by an evaluation from 2011 of the gastronomic school garden program, Gardens for Bellies, which showed positive effects on children’s food knowledge and ecological literacy. This new research study investigates the pedagogy in new school garden set-ups as well as the effects on children’s learning. The research is based on qualitative, explorative studies of four different school gardens. The study investigates children’s self-perceived learning and teachers’ and garden educators’ perception of pedagogy and learning opportunities, including the integration in the curriculum. It is based on garden observations, interviews with teachers and garden educators and focus group discussions with children two months after the programs were completed. Preliminary findings show that children benefit from learning in a school garden. Not only do they feel more motivated about being taught outside, they are also better able to understand complex connections and concepts; garden-based learning is perceived to be more exciting. The students’ perceived ownership of the garden experience and harvest and understanding of the seed-to-table process, pollination and biodiversity leave the biggest impressions on the children afterwards. New ways of organizing school gardens open up opportunities for involving teachers more, integrating the learning back in the school and bringing about innovative changes in primary education as a whole. The garden classroom and motivated educators improve children’s willingness to learn and connectedness to nature.

Keywords: school gardens, garden-based learning, innovative teaching, ecological literacy, food literacy.

1. Introduction

A growing number of children and youth lack a connectedness to nature and being physically activity. Research shows that they lack an understanding of where food is coming from, of seasonality, sustainability and the food system (Dyg, 2014; Chenhall 2010; Lang, Caraher 1999, Caraher, Dixon et al. 1999 Barton, Koch et al. 2005; Hess, Texler 2011). At the same time, the world is faced with devastating environmental destruction and economic uncertainty, which demand sustainable solutions for all areas of our daily lives. Innovative and holistic solutions to these challenges demand new knowledge, skills, competencies, commitment as well as interdisciplinary thinking, some of which school gardens and related training can foster. The school garden setting and outdoor hands-on learning also provides a learning space conducive for reaching a broader range of children and youth with different learning styles, needs and backgrounds. It enables a learning space for doing investigations and experiments on various nature elements and working with plants, conducive for learning valuable academic knowledge, including science and to develop practical gardening skills. The activities also help children to be self-efficient and build confidence in their future (Walicze et al, 2001; Rahm, 2002; Dyg, 2014).

Adding to the yet still limited international research on school gardens from Europe, Wistoft et al (2011 and 2014) investigated the Gardens for Bellies school garden program in a municipality in Denmark showing successful experiences by teachers and pupils. Since then there has been a strong movement and political willingness to establish school gardens across the country. This coincides with the Danish School Reform from 2014, which focuses on alternative and experiential teaching methods, more teaching hours and daily physical activity all of which open doors for integrating garden activities and other outdoor pedagogy at large scale across the country. With this growing attention in Denmark on garden-based learning and experiential teaching methods, Gardens for Bellies was allocated funds to disseminate school gardens across Denmark from 2014-2016.

2. Objectives

The objectives of the research is to investigate children’s self-perceived learning and teachers’ and garden educators’ perception of pedagogy and learning opportunities, including the integration in the curriculum. Secondly, the
initial findings will be used to identify recommendations as to how school gardens contribute to transforming the educational system in a more interdisciplinary and sustainable direction.

3. Methods

The research follows the implementation of five school gardens from 2014-16 out of more than ten school garden programs, which are currently being initiated in municipalities across Denmark. The selection criteria for the school gardens include differences: 1. geographically, 2. the physical location of the school gardens (urban, rural, on a farm and on school grounds), and 3. in the stakeholders involved and organizational set-up.

Based on these criteria, five different school gardens have been selected of which four at present have been investigated, due to different start-up dates. The research is based on qualitative and explorative studies of the school gardens, involving field observations, interviews with garden educators, teachers, decision-makers at school and municipal level, participation in workshops with teachers and garden educators, as well as focus group interviews with pupils two months after the completion of the school garden program, which involved 6-8 visits to the garden.

The first school garden is located on a private organic farm in a rural area close to Copenhagen with a professional gardener, chef and nature guide teaching children about gardening, the nature around the farm, farm animals, bees and pollination, and cooking. With partial municipal funding, schools across the municipality visit the farm by train. The second school garden setting is an urban area, where the municipality has supported the establishment of three school gardens in or near the city. The main school garden is located in a nature center near a lake in a peri-urban area with nature guides and others with a pedagogical background teaching about gardening, nature, farm animals and cooking. The third is located at a school, where teachers and students across subjects and grades. 7th graders were involved in building the school garden from the very initial steps. The plan is that the school garden should be an offer to all interested teachers to use it in their subjects. The actual teaching is expected to start after August 2015. The fourth is in a rural municipality, where the plan is to set up school gardens in rural towns across the municipality. A pilot garden was initiated next to a small community garden in a rural town, where three teachers use the garden to teach science, home economics and Danish language. Students cook in the school garden and back at the school and sell some of the harvest in the school shop. A fifth garden project will be investigated in the coming season. This garden project is a community garden, which will be set up in three apartment areas with a high percentage of low-income and ethnic minority residents. It will involve all residents, including schoolchildren.

4. Findings

The initial findings from the research, which is not yet completed, are presented below with an emphasis on the impact of the outdoor setting, the pedagogy used in the gardens and the learning in the gardens as it is perceived by the children themselves, the teachers and garden educators.

4.1. The impact of the outdoor setting on teaching and learning

Interviews with teachers, students and observations of teaching in the gardens show that outdoor learning space in a school garden provides a spacious environment and sensory impressions that children thrive in and find fun and educational to be in. The opportunity for free play between the various activities, learning in nature and being outside in fresh air is something the pupils appreciate; not being confined to a chair and four walls all day. This is even the case when the weather is cold and rainy. Although observations during a day in the garden with wind, rain and cold showed that the children’s attention to the garden educator is reduced when trying to keep warm, in hindsight the pupils do not recall poor weather to be a problem. Nonetheless the attention and learning of the pupils on those cold days is clearly reduced. The open space can, however, also be a challenge for some teachers due to the lack of structure and control the open space affords. Especially the teachers taking their pupils to the farm-based school garden highlighted the need for more defined ‘space’ in the garden: places in the garden to sit down and eat, hold group sessions, get shelter and avoid the children running around everywhere.

The four different garden settings offer different opportunities for learning. Two of the school gardens provide the opportunity to learn about animals and agriculture. Both have livestock and one is located close to a dairy company, where pupils can make their own yogurt. The school gardens also have bee hives, which enable teaching about pollination and the importance of bees for the ecological cycle and agriculture. The two school gardens located on or within walking distance from the school enable more frequent teaching in the garden and for the teachers to only spend one to two lessons in the garden instead of an entire school day. Here it is the teachers who themselves are using the school garden as an outdoor alternative classroom. The science and Danish teacher in the pilot school garden finds it
much easier to teach pollination, fertilization and ecology than normally through a book. She also works with developing her pupils’ writing skills and work with fiction in her Danish language classes. Here her pupils write a story in the garden, where they bring a flower or pumpkin to life through writing and doing puppet shows with some of the crops.

4.2. The garden-based pedagogy – opportunities and challenges

Different forms of pedagogy applied in the school gardens are largely connected to the background of the various educators involved in teaching in the gardens. As mentioned, in two of the gardens it is teachers who teach (or will be teaching) in the gardens, whereas in the two other school garden programs, the educators are so-called experts: a gardener, a chef, a nature guide, a beekeeper and educators with a broader background in health and pedagogy at the nature center. This is reflected in the pedagogy. The ‘experts’ can have a greater professional focus, which can both be received by the pupils as being qualified and captivating to be taught by a real chef, farmer or nature guide with stories that catch the children’s interests. However, it can also have the risk of being too complex for the children to comprehend. Although none of the ‘experts’ have a background in pedagogy, they have a strong focus on what they call an “appreciative” approach. They define this as not yelling at the children, giving the children recognition for what they do and focusing on their successes and learning from their mistakes. This can according to these garden educators clash with some teachers, who they feel often yell too much at the children in the garden, “adopting the same approach of yelling and needing to have control over the pupils as they do back at the school”. In the nature center, where the educators have a pedagogical background limited time is spent talking or teaching. Time is spent on children’s own hands-on activities, indicating a clear focus on experiential learning.

In the first Gardens for Bellies program established in 2006, where the municipality made the school garden program mandatory for all primary school students, teachers often take on a rather passive role while in the garden: primarily one of keeping an eye on the pupils. This was not something that was articulated elsewhere even in the two school gardens with ‘expert’ garden educators, which the first Gardens for Bellies program also employs. Teachers themselves felt they had a lot of functions in the school garden both with teaching, but also taking care of the more pedagogical aspects, like group dynamics and life skills. It can still be a challenge to find time to work on the themes the pupils worked with in the school garden back in class. Some of the teachers have given their pupils a logbook, which they will use during the process to write their experiences and reflections down.

4.3. Learning opportunities

The teachers and children themselves mention that cultivation, knowledge of different vegetables and the direct understanding and connection from farm to table are the key learning potentials of school gardens. The children’s after-reflections after two months about what they learnt show that they highlighted learning how to grow vegetables, the process from seed to table, learning about bees and pollination, different varieties of vegetables, which they did not previously know and fertilization. They also stressed that learning new flowers and names of other plants in nature had been exciting. The children could easily explain what they learned in the school garden and how it was related to subjects in school, especially science, but also Danish language, home economics and mathematics. They saw in other words a direct relevance to their academic learning and unanimously agreed that it was more exciting to learn about these subjects in the school garden. However, some teachers mentioned that for children who need more structure, it can be harder to be out in a school garden. For one boy, who was very strong academically and keen on computers, the school garden was “nothing special”. He explained that he would rather be at the school. Also some of the children with different diagnosis like ADHD and autism had mixed feelings about the school garden. Some of them enjoyed the outdoor setting and others were easily distracted.

The children all showed great interest in cooking outside on fire. It was rewarding to cook with vegetables they had grown themselves that “were not just purchased from the supermarket” as several highlighted. The outdoor made it more fun and easier to experiment and children were more willing to try the food when they had grown vegetables, cooked the food themselves and made it over a fire. Some of them attached some success experiences with growing and cooking vegetables, because they themselves were responsible for it: making it taste good and not always having to follow a recipe. Taste is emphasized: children taste the food that they make and the nature around school gardens, where the nature guide gave them the opportunity to taste sea buckthorn, blackthorn and even mealworms. This is a good example of how children learn with all their senses: not just sight and sound but also with their feelings, taste and smell. Daring to try something new that is sour, perceived to be disgusting or dangerous, takes the children out of their comfort zone to exceed their own boundaries, which when they do, they perceive as exciting, they get recognition from their peers and experience it as a personal accomplishment.
5. Discussion

An important objective is to highlight how school gardens can contribute to transforming primary education in a more interdisciplinary and sustainable direction giving children skills needed to act in an environmentally, socially and economically sustainable manner. School gardens give them an understanding of and an interest in nature, which shows them that they are connected to nature in a very direct way. They develop a respect for nature and all its components and learn that they are mutually dependent: all is essential for acting in a more sustainable manner. Understanding complex connections and scientific concepts, such as biodiversity, ecology, pollination and seed-to-table processes and their relevance for children’s daily lives are fundamental for understanding the concept of sustainability. Developing skills on how to grow food and cook are essential skills for living a healthy and sustainable life later on in life.

The school garden acts as a real life setting not just to teach about sustainability and science, but also where different subjects can be taught in a hands-on experiential and interdisciplinary manner, where different subjects become more relevant and exciting for the children to learn about. The excitement for learning and experiences of success, which the children revealed pertaining to their experiences in the school gardens, is exactly what is missing for some children with less academic aptitude. The school gardens offer a unique opportunity to attract more children to be interested in science, which is found to be a challenge in many countries including Denmark (Desmond, Grieshop et al. 2004, Skelly, Bradley 2007, Wistoft 2013; Dyg 2014). Going from a theory-driven, teacher-controlled and closed teaching environment at the school, to learning based on an interaction between theory and practice, which is student-driven, and based on a real-life, place-based learning environment is contributing to transforming education. What the children learn in the gardens are important foundations for understanding sustainability later on during their education and in life.

One of the key challenges of many school gardens is involving teachers in activities to ensure that what the children learn in the gardens is followed up in the classroom and later on in their education. The new ways of organizing school gardens in the four cases open up for better opportunities for involving teachers. Teachers are integrated better in the planning of the school garden program, they are given more responsibility for certain activities, and there are more cases of school gardens located on schools or in the vicinity of the school, where the teachers are also the garden educators. There is, however, still room for further improvements.

What policy implications do the promotion of and dissemination of school gardens have? Experiences from Denmark show that it is vital that school gardens are supported politically and financially by municipal and national governments, in order to ensure that there is a long-term ownership and support for school gardens in the municipalities. School gardens cannot run successfully long-term, unless they are incorporated into the municipalities’ educational strategies and allocated secure long-term support. In most municipalities in Denmark with school gardens, they are backed by municipal support: they are explicitly written into the educational strategies of the municipality and have some sort of long-term municipal support, either in-kind (e.g. land), support to salaries for staff or as a financial support, so that each school does not have to pay the full amount to participate in the school garden program.

What has been of key importance in the development of school gardens in Denmark is strong political emphasis on alternative teaching methods and connections between schools and the surrounding society in the national school reform. To prepare and equip teachers with appropriate skills to use school gardens it is critical that resources and time is set aside to train teachers in the opportunities and tools to use school gardens in their teaching. Pedagogical principles and tools in outdoor pedagogy and Education for Sustainable Development are essential. This takes us to the need to revisit the core purpose of education and the educational system. The main underlying goal of school gardens is not to enhance science aptitude and promote more effective learning to ensure a more productive and skilled future workforce. Rather school gardens need to go hand in hand with a reorientation of the underlying purpose of education: namely to engage future citizens in actions, which connect to nature and promote rather than threaten a democratic, socially and economically just, and environmentally sustainable society. In Finland, the overall purpose of the school system was changed to one of promoting the well-being for all, protection of nature, and building a sustainable future. Thus, there is a need to reconsider the underlying purpose of the educational system to match societies’ need for a sustainable societal transition.

6. Conclusion

Children benefit from learning in a school garden. They are better able to understand complex connections and concepts; the seed-to-table process, pollination and biodiversity leave impressions on children afterwards. Not only do they feel more motivated about learning outside, garden-based learning is perceived to be more exciting and fun. The
garden classroom and motivated educators improve children’s willingness to learn and connect to nature. The connectedness to nature, seeing oneself as part of a bigger ecological cycle and the ability to think holistically and work inter-disciplinarily are all key components of Education for Sustainable Development. The school garden setting offers a possibility for promoting a stronger interaction between theory and practice, learning that is student-driven, and based on a real-life, place-based learning environment, which can contribute to transforming education. This learning is an important foundation for sustainable living. School gardens need to be supported politically at municipal, national and internationally by making them part of a wider change in educational strategies.

7. References


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