

## ***The School Garden as Learning Object and Learning Space in Primary Schools***

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### **Abstract:**

This article outlines the changing discourses on school gardening as a learning object as well as a learning space. Based on observations and interviews with different stakeholders it is understood, that Outdoor Education provides a meaningful multidisciplinary and multisensory learning space. The students learn to cope with issues like sustainability, innovation and social justice as situated learning. The main focus of the article will be on the interplay between the experience and reflection of the students. In the school garden the students learn how to grow and care for vegetables in an organic and sustainable way, and to understand the process according to their own capabilities. Relating scientific knowledge and social justice to everyday life, in a systematic way, is understood as the core of garden based learning.

**Keywords:** School garden, outdoor learning, sustainability, situated learning, social justice

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## **Introduction**

In Denmark, a small state in Northern Europe, 80% of primary education students have become urban citizens and therefore they no longer grow up with an intimate relationship to an outdoor environment and food production. Schools have responded by creating curriculum-based outdoor activities, for example specific subjects, or interdisciplinary approaches like school gardening, can be moved outside. The trend has spread into different types of courses for students aged 7-16, and in 2014 17,8 % of the public schools and 18.8% of the private schools offered outdoor learning as an alternative to indoor classroom education.

The increase of outdoor learning has taken place in the same period as primary education changed from contents based education to goal-based learning. Broadly speaking, there are two overarching education traditions in Denmark: An older German didactic tradition and a newer Anglo-American curriculum tradition. The German tradition originated in an understanding of schooling as *bildung*, meaning a process of personal formation that brings inner development of the individual through education. Schooling was not only seen as a process of acquiring knowledge but as an enactment of teaching and learning based on all senses. The local teacher was granted a lot of autonomy and could respond to the needs of the students according to his or her preference of pedagogical theories. The overall aim, however, was the same in all schools: A development of independent, authoritatively knowledgeable and responsible humans.

The Anglo-America tradition has often been focused on fixed contents driven curricula with the assumption that specific knowledge and skills are necessary to be an educated individual. Thus the German didactic tradition and the Anglo-American curriculum tradition are based on different approaches to learning, but during the last two decades the curriculum tradition has become more influential, however, personal formation still remain a core objective of the overall aim in Danish primary education.

## **Aims and purpose**

This project examines the urban school garden as an outdoor learning space and learning object for primary school students. How can outdoor learning in a school garden meet the compulsory social and academic standards in primary education? This question was raised in a class, where my students were discussing alternatives to indoor classroom teaching. They were uncertain about being able to identify the interplay between the children's experiences in the alternative learning space and their knowledge outcome. As teachers they would be expected to perform with visible results such as students' skills assessed using 'evidence-based' evaluation results in the form of national tests, final examinations and international assessments like PISA. To be able to deal with this dilemma I will examine the question:

How can a school garden as multidisciplinary and multisensory learning space and learning object stimulate primary students' learning about sustainability and social justice in everyday life?

In the next paragraph I will introduce my theoretical framework drawing upon outdoor education

### **Theoretical framework**

In this project, school gardening is understood as being included in the theoretical framework for outdoor education. The teaching approach to outdoor education is understood as an integrated part of mainstream education, and here it will be presented as a way of providing learning opportunities in the interplay between experiences and reflection based on concrete and authentic situations. The class will simply move outside to a nearby location either once a week or at least half a day every second week. If this approach is used year after year in primary education, the students will spend months learning from nature and society outside the classroom. The green space is understood as a resource in an urbanized society and providing physical activities as well as having an effect on social relations, motivation and psychological wellbeing. (Jordet, 2007)

In the article I am also using the concept of situated learning to understand the interplay between sensory experiences and book learning in a schooled way as understood by Jean Lave and Etienne Wenger. (Lave & Wenger, 1991)

### **Outdoor education**

In Scandinavia the concepts of outdoor education or outdoors teaching and learning used to be synonymously expressions for working outdoor on a regular basis. The concepts were referring to a grassroots movement on redefying education, and also understood as a teaching method. The local teacher found an outdoor setting for the students, topics to be taught, and then the teacher would introduce a commitment to human responsibility for stewardship of the land and the importance of understanding all facets of an ecosystem. Little was known about these pedagogical activities, approaches and programs taking place as part of the compulsory education in public and private schools. Today, outdoor learning has become an informed field by the research and theories on the subjects, and the students are supposed to work with clear goals and evaluation of the outcome. The institutionalization of school based outdoor learning has developed over the past 10 years in Denmark as well as internationally. (Mygind, 2008) In the article the understanding of outdoor education and learning as schooling will be understood according to principles developed by Arne N. Jordet from Norway, a pioneer of outdoor schooling.

“Outdoor schooling is a working method where parts of everyday life in school are moved out of the classroom – into the local environment. Outdoor schooling implies regular activities outside the classroom. The working methods gives the pupils the opportunity to use their bodies and senses in clearing activities in the real world in order to obtain personal and concrete experiences. Outdoor schooling allows room for academic activities, communication, social interaction, experience, spontaneity, play, curiosity and fantasy. Outdoor schooling is about activating all the school subjects in an integrated training where activities out-of-doors and indoors are closely linked together. The pupils learn in an authentic context.” (Jordet, 2008, p.1)

In outdoor learning compulsory education activities take place outside the buildings of the school on a regular basis, and researchers, who followed these activities, had gradually been able to provide an understanding of the outdoor learning processes. These activities will have a documented effect on student motivation, school-being, physical activity and health.

The classroom teacher has the authority to plan outdoor learning by making use of the outdoor environment near the school, when teaching specific curriculum areas. Parents' permission is not required, but they are expected to support their children by providing adequate clothes and lunches. All school subjects are relevant, either individually or as interdisciplinary studies. The didactic is based on an understanding of the importance of places, people and activities, and learning is understood as social- cultural phenomena.

The ambitions of outdoor education are high, but research has documented that regularly a tension occurs between how things ought to be and how things actually are. A curriculum can be understood at different levels. When looking at this complicated process, it is obvious, that there will be room for making mistakes. (Bentsen 2010, p.76).

### **Situated learning**

In the school garden students step into a learning space so different from the indoor classroom, and it is an important question, how the context affects their ability to learn? To approach an answer to the question I will introduce the concept of situated learning as a matter of becoming involved in a community of practices with legitimate peripheral participation. Originally Jean Lave and Etienne Wenger introduced these concepts in order to analyse learning as a collaborative process in a specific context. The common understanding that knowledge can be taught decontextualized in a school is questioned and replaced by the approach, that schools themselves as social institutions and places of learning constitute very specific contexts. (Lave & Wenger, 2001).

By emphasizing participation in communities of practice as the cognitive starting point Lave and Wenger moved the analytical attention from the emphasis on the individual elements (cognition, knowledge and learning) to the influence of changing relations between the participants, tasks and tools. Here, learning is understood as a process the individual is taking part in by participating in the communities of practice. Knowledge is not just generated as transfer, but through active participation in changing types of practice and related to a specific context. In opposition to the prevailing theories, Lave and Wenger claim that knowledge and learning must be understood in a much more context sensitive way (Lave & Wenger, 2001, p. 34)

To understand the collaborative learning processes a concept of legitimate peripheral participation was introduced as an analytic tool to understand certain forms of learning dynamics, such as observing, listening and imitating in a community of practice and gradually becoming more and more skilled. In a school garden the students were engaged in the practice of gardening with limited responsibility of maintaining their own garden but also as a part of a

garden community with a shared goal for their activities, and gradually they were learning and becoming better at finding solutions.

### Methods

The data for this paper comes from my fieldwork in a school garden, and I have used a mixed methods approach, including observation, questionnaires, and interviews with stakeholders. The observations of 27 students in grade 1-2 took place over a period of 5 months one morning per week. To include a child's perspective the children were asked to answer a questionnaire with pictures and open questions about their experiences during the garden season as well as making drawings of the school garden experiences and an oral evaluation with the school garden teacher.

### The Danish context

According to the national Danish School Acts the public and private schools are expected to provide academic knowledge as well as bringing up the next generations of citizens to understand their rights and duties in a democratic society, and thus the schools are expected to meet students in public schools and private schools with paired requirements.

The public schools system must provide knowledge and skills, promote creativity and independence and prepare students for further education. The daily activities, therefore, must be conducted in the spirit of intellectual freedom, equality and democracy. The School Act has goals for social skill as well as subject knowledge, and when dealing with issues like sustainability, innovation and social justice, a situated learning environment like a school garden is meeting the goals in accordance with the spirit of the law. In the school garden students learn to grow and care for vegetables in an organic and sustainable way, and to understand the process according to their own capabilities. Relating scientific knowledge and social justice to everyday life in a systematic way is understood as the core of garden based learning, but the local municipality will often have to be involved.

In Denmark, the public schools are run by a local municipality and the same curricular structure is used in all parts of the country. On one hand the local schools have freedom and can make their own syllabus, but always according to the aims and skills layered down by the central administration as the target for each subject. Each school is responsible for ensuring the quality of the education by conducting aim-oriented education, classroom management and supporting education to general subject-based teaching. The school is also expected to cooperate with the parents and the local community.

### Revitalising the school garden

My fieldwork took place in an old school garden in Copenhagen, where 800 students come every week to care for their plants and the animals. The 14,000 square meters school garden is isolated from the city by old trees, scrubs and bushes, and has compost toilets. When the students enter through the gates, they walk into an environment so different from the surrounding 1930s working-class neighbourhood. In today's school gardens the individual child as well as the common praxis embedding the individuals are in focus. The study of situated learning is based on the prior assumption that the context matters to learning and knowledge. In the

school garden abstract knowledge is transformed and contextualized, and knowledge is connected to the praxis in a community, and thus in collaborative learning context and relationships matters to the student outcome.

### **The school garden program**

The school garden is organized by a non-commercial organization called Københavns Skolehaver. The organization hosts the school garden programs for public and private schools and has a contract with Copenhagen Municipality on providing activities all year for children in kindergarten, primary and lower secondary schools. Around 30.000 students will be involved in activities throughout the year, and they mostly take place from April to October. On the school garden webpage students, parents and teachers are informed that at a point, where the world faces serious environmental problems such as climate change, it is important, that children experience the beauty and diversity of nature and learn that they can make a difference. It is important that children can see that it matters, when they make an effort. In the garden, they learn in a very concrete way and they see, how it all develops from spring till autumn.

The school garden organization has a vision, and on weekly basis the students are encouraged to pay attention to the diversity of the biotope and to understand gardening in a broader context of sustainability. The webpage of Københavns Skolehaver tries to give its readers a wake up call about climate change, and the same message is conveyed) to all the users of the garden. The children are encouraged to be aware of local and global climate changes, not as an abstract discussion, but as a personal and practical experience, where everybody can take action. The students' learning can be understood as a formation of new cognitive structures, but also as knowledge incorporated through all their senses into the body.

### **Activities in two seasons**

The school garden has two seasons with different programs. During the winter season the students from the city visit the school garden to participate in activities like bird watching with binoculars or learning about the evolutionary history of the hens, their way of life and importance to humans. In the chicken coop they can feed the chickens and roosters, and if they want, they are also invited to help slaughtering a rooster or hen. The visit includes taking the guts out of the animal, and cooking it on a stove in the garden. The aim of the activities is, in one day, to provide new experiences for urbanized students, and make them aware, that poultry does not only come from the freezer at the supermarket. For some students, however, there was more at stake, they learned to take part in processes they never had dreamed of. To slaughter a hen is crossing a barrier for many urban children, and by doing this they exceeded their normal self and their own understanding of personal abilities. Thus the school garden organization can also be understood to provide opportunities for innovation and creativity for the students, two important tasks for the Danish school system to be able to deliver.

The main activities take place during the summer season from April to October. The students I met during my fieldwork came to the school garden accompanied by a teacher and an assistant every week for 3 hours. The teacher was expected to support the aims of the school garden by preparing and post processing the school garden activities in their home classroom. The school garden teacher for this group was an

agronomist, who had a detailed program for the season with concepts and skills to be learned according to the students' capacity. Each student had their own garden with salad, carrots, onions, red and white potatoes, runner beans and sunflowers. They all had the same plants, because the garden was first and foremost a space for learning and only secondly a place for production of food. The plants were chosen to teach photosynthesis to young students.

All mornings in the garden were organized in the same way. The students began with circle time and the 27 students would sit in a circle on six simple benches listening and talking with the school garden teacher. In this way the teacher had 10-15 min. to prepare students for the activities, and make them understand that they were concept based just like in the school, but often in the form of a narrative. The circle group gave the school garden teacher eye contact, and complicated themes were introduced in a dialog with the students. She took on the master role, sharing her knowledge. On a good day the students were listening, watching and discussing with her and each other. No papers, pens or tablets were used. After the introduction the students worked in their own garden for 20-30 min, came back in the circle for food and more instructions, and followed before new tasks to be done in the garden. At the end of the morning a final circle time took place where the results were discussed. On the best days, the students had been part of investigative community, they circulated and possible solutions were tested in the dialogue.

The structure of the day was well known to the students from their own school, but the space was different, and their bodies were useful, not just something to decontrolled within a very limited space. In the next paragraph I will analyse some of social aims and knowledge concept to be target.

### **Social aims in the school garden**

In primary education the formation of a democratic citizen is seen to be an integrated part of education, and these young students should learn to behave in a new social space, be able to work with partners they normally don't work with, defend their rights, manages conflicts and their own emotions. In the beginning of the season the garden teacher focus on student behaviour in the unknown place. Before they arrived, the classroom teacher had laid out the topography of the school garden on the blackboard, and the students knew, that they were going respond to the rules in the garden in an adequate way. They also knew that there would be worms and insects in the garden, and that the limited space in their garden required cooperation with the neighbours.

During the season all sorts of social challenges were taken on by the students, and in the end pieces of land were more productive than the rest, and should all get the same amount of vegetables by sharing or could you bring home all you own vegetables and flowers?

One day a thief had stolen the children's food from their bags, but no money or keys were missing. Are you allowed to steal, when you are hungry? Questions on morals issues were not abstract questions in these children's minds. They could deal with the same question in the school, but then their experience would come out of a book. Social skills at a personal and mental level can be developed in authentic situations, and in the school garden they learn in a different way compared to the classroom. Empathy for others is an important part of being a democratic citizen in a welfare

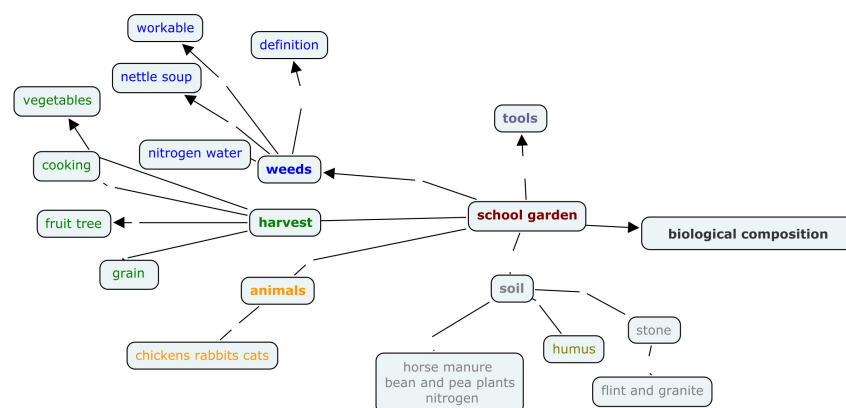
state. But also conversation on existential topics took place in between weeding the plants or looking for insects, when the teacher has been asked to help solving a problem in one of the students' garden.

Parents were also welcome in the garden. They took part in activities as guests, helping a few students, but not commenting on the activities. In this way parents had a direct access to observe the way their children were thought in outdoor education.

### Knowledge and skills in the school garden

The program on knowledge and skills was organized by the professional staff in the school garden in accordance with the national goals for primary education, and the students studied at their own level with topics related to the season such as seeds, weeds, and organic production. Ideally, the classroom teacher would prepare the students for the topic of the day, but in this class the math and the nature- and technology teacher preferred to use the student experiences at a later point in the classroom, and thus being able to connect to their knowledge from the school garden, when dealing with relevant topics throughout the school year.

In order to make an overview of some of the topics and activities taken on by the students in the school garden I will use a concept map. The map can illustrated how systematic a teacher can proceed even in a classroom without walls. A lot of time was spend on biological composition as well as practical activities



The learning goals in the garden were related to the change of seasons. In the beginning, students sowed in grey brown soil and at harvest time the garden was full of fruit, vegetables and flowers. When you are living in a big city, this is an unusual experience, and though out the season these experiences take place, while learning about topics from the national goals to be learned, for example



Week	Topic	Goals	Activities	Concepts
22	Weeds Useful plants Bees	What are weeds? Where does it come from? Know and eat your weeds. The important role of bees In the garden.	Weeding in the garden Look at the hives, Tasting nectar, Pollen and honey	Useful plants Pollination
33	Harvesting Photosynthesis	The miracle of growth. Nodule bacteria on the roots Repeat what plants need to grow	Harvest	Propagating Seed dispersal

The table referred to a week from the beginning and at the end of the garden season. In week 22 the students were busy with categorizing plants. When were plants useful or just weed? Or perhaps a plant could be a weed as well as a useful plant depending on the context. Categorizing was an academic skill, and in the school garden it was obvious, that nettles were not nice to have in their garden, but fine for cooking soup on a fire later in the morning.

The students also learned about the organic cycle, when they were asked to through weeds on the wide garden path, where the plants would be degraded during the summer. Later in the season the weeds had to be brought to the compost heap, because it was too late for composting on the path. By doing these practical tasks and talking about them in circle time the student learned, that there was a connection between temperatures and composting, and maybe even more important, they also had this knowledge incorporated in their bodies.

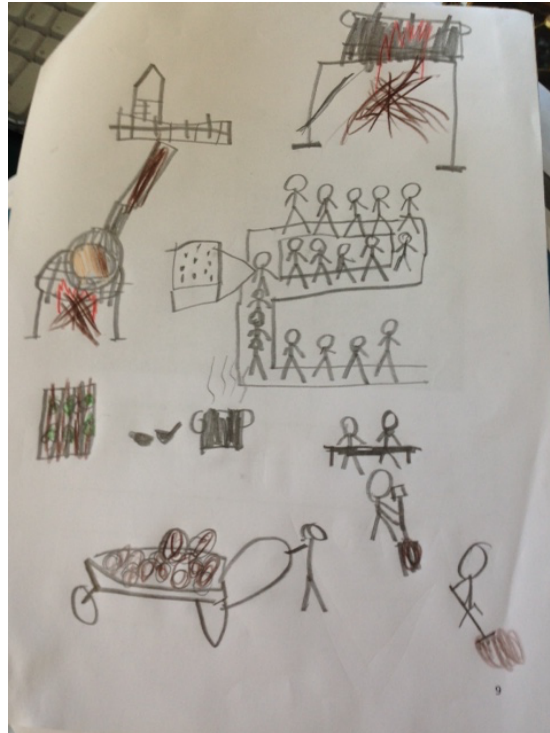
Photosynthesis can be difficult to understand for students at the age of 7-8, but to the school gardeners the process became obvious, when they were introduced to the small bulges on the runner beans. The Nitrogen depots also referred to as lunches for the plants made the connection between the air and the plant understandable. The following week they students ran horse manure on the soil in wheelbarrows. The experience was challenging on a personal level to a few students, and for most students the experience was adding to the student knowledge on sustainable horticulture, but also adding to their sense of being good citizens leaving fertile soil for the next season's users, and just as well prepared for a new season as they had received their gardens in the beginning of the spring.

The school garden experience was a process or a flow of incidents, referring to each other throughout the season. The flow of experiences was interrelated, and the added value was a sense of continuity throughout the season. Already John Dewey had described this way of active learning as an important experience, because something recorded in the previous experiences was improving the quality of the experience. (Dewey, 1991, p.56)

### **A student perspective on school gardening**

At the end of the season the students were asked to evaluate their own school garden experiences by using three different approaches. These approaches were chosen to allow the students to express themselves according to their individual abilities as 1 and 2 year students. At first the students had an oral evaluation during the final circle time in the school garden. The students were asked to list the subjects they had learned about in the school garden, and they came up many different topics. At their return to the school in the afternoon they were asked to make drawings about the experiences in the garden, and four days later they had to fill in a questionnaire with images and short questions on their learning however, only 70% filled in the whole questionnaire and the rest partly or not at all.

In the classroom I asked the student to interpret their own drawings, and it became very clear to me that the social aspect of gardening was very important to them, however, some students had also reflected on the knowledge content or a combination of these two aspects. The drawing below is an example of a student telling about different experiences. In the middle she has depicted the class walking around in order to create a garden infrastructure. She was referring to the first day, when the students had to make paths between their small gardens in order to be able to move around without spoiling plants. This event was also the beginning of the school garden experience and thus placed in the middle of the paper. To the left the student has depicted a fire plus a pan with a baking pancake referring to a social event on a Friday afternoon with parents and friends visiting the garden. Above to the left the chicken house was placed next to the canopy providing shelter against rain and hail in the garden. Just below the walking group a reference was placed to a soup pot and the cups used for eating. The students had been asked to categorize weed, and afterwards they cooked soup using one of the plants previously categorized as weed plus vegetables. The students had also been cleaning the vegetables on the table on the right side of the paper. The images at the bottom are referring to a morning at the end of the season, when the students were transporting horse manure in wheelbarrows and spreading it on the soil with grips. In this drawing the student covered many experiences from the school garden season, and thus summing up important aspect of the intended learning outcome as a continuing story. The chosen format has similarities to a graphic tale.



Several of the drawings were referring to circle time on the benches and with a fire in the centre. The fires were often depicted in red and yellow colors, and thus reflecting observation of burning tree. Two boys made images of a game played during the brakes in the “wood area”, and these drawings had lots of details, however, the boys didn’t want to tell me about the details in their game in the wood. The content oriented drawings were focusing on bees, seeds and birds, often made in a less expressive style. The student’s drawings seem to emphasize the social aspect of learning and the importance of togetherness in a community.

## Conclusion

My interest in school gardens was fostered by an incapability of simplifying and transforming a complex didactic professionalism into situated learning in a twenty-first century context. On one hand accountability was needed, and on the hand the students had to learn to work with problem based learning empowering them to navigate in an unpredictable future, and a school garden seemed to be a good place to start. Here the students learn to cope with sustainability and social justice in an authentic context. The main focus was on the interplay between the student experience and their reflections, and the school garden learning process can be understood as a flow of incidents, referring to each other throughout the season. In the school garden students learn to grow and care for vegetables in an organic and sustainable way, and to understand the process according to their own capabilities. Relating scientific knowledge and social justice to everyday life in a systematic way is understood as the core of school garden based learning. The school garden model can be different, adapting to the location environment and the people involved, and therefore also an option in different parts of the world.

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