



Master's thesis

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Nature as a learning tool in the public school system

- A case study on Albertslund Municipality



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Submitted: 30/11/2014

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November 2014

Master Thesis

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Picture: Private Photo - the stone on top of Herstedhøje

Abstract

This thesis is about how nature can be used as a learning tool for teachers. There are many benefits connected with using nature, it can help children that have problems with sitting still. Nature can help with children's development and give them a good connection not just to nature but also to others.

Teachers have different barriers against using nature, they recognize the importance of using nature, but have trouble seeing how they can use it again. The barrier is education, security, communications and age of children. The key elements is communication and security. The communication between the municipality and the teachers could be better, it could enable on how teachers use nature and they would feel more secure if they felt municipality listened to them. It could be by they could get an extra teacher when they leave the school to go on trips. Communication between the nature school and the teachers, the teachers do not feel confident in how they can use nature and therefore they do not use the nature school as much as they would like to. The nature School in Albertslund have function a bit differently than other natural schools, it help the logistics, not teaching the students. Here it might help if teachers could get courses so they could learn how to use nature itself, the nature school is willing to offer these courses.

The basis for better communication to be built a common understanding of what can be done, this will the new nature guide hopefully be able to help with. The person must first of all make sure to understand what it is teachers need and therefore build the courses on around it. If teachers at the same time can get help when they go on trip, so it will make a big difference to the teachers and they would be able to use the opportunities they have better.

Resumé

Dette speciale handler om hvordan naturen kan bruges som et lærings redskab for lærerne. Der er mange fordele ved at bruge naturen, det kan hjælpe børn der har problemer med at sidde stille i skolen og hører efter. Naturen kan hjælpe med børns udvikling og give dem en god kontakt med naturen men også med deres medmennesker.

Lærerne har forskellige barriere mod at bruge naturen, de anerkender vigtigheden af at bruge naturen, men har problemer med at se hvordan de kan bruge den mere. Barriere er uddannelse, sikkerhed, kommunikation og alderen på børnene. De vigtigste er kommunikation og sikkerhed. Kommunikationen mellem kommunen og lærerne kunne være bedre, dette vil kunne hjælpe på hvordan lærerne bruger naturen, de ville føle sig mere sikre hvis de følte kommunen lyttede til dem. Det kunne være ved at de kunne få en ekstra lærer med på tur når de forlader skolen. Kommunikationen mellem naturskolen og lærerne, lærerne føler sig ikke sikre på hvordan de kan bruge naturen og derfor bruger de ikke naturskolen så meget som de gerne ville. Naturskolen i Albertslund fungerer en smule anderledes end andre naturskoler, den er til for at hjælpe logistikken, ikke for at undervise eleverne. Her kunne det hjælpe hvis lærerne kunne komme på kurser så de kunne lærer hvordan de kunne bruge naturen selv, naturskolen er villige til at udbyde disse kurser.

Grundlaget for bedre kommunikation skal bygges på en fælles forståelse for hvad der kan lade sig gøre, dette vil den nye naturvejleder forhåbentlig kunne hjælpe. Personen skal først og fremmest sørger for at forstå hvad det er lærerne har brug for og derfor bygge kurserne om omkring det. Hvis lærerne så på samme tid kan få hjælp når de tager på tur, så vil det gøre en stor forskel for lærerne, og de ville være i stand til at bruge de muligheder de har bedre.

Preface

This report is a 30 ECTS-points master thesis on the candidate Forest and Nature management. It is made over the summer 2014, handed in 30 November.

It made for municipalities and schools with an interest in getting their teacher to use nature more. It is also for other interest in how nature can be used in schools. It could be of interest to the teacher so they can get ideas on how to use nature.

This thesis is a result of a six months process, where I have shared frustrations, ideas and help from different great people.

I would like to thank my supervisor for all the help, she have given me throughout the project, and you have been very helpful on ideas, support and guidance.

I would also like to thank Jette Rasmussen, Jannie Fuglsang, Joan Yrsa Pedersen, Lene Bjørn Jensen, Malene Bendix and Henrik Søfeldt Jørgensen for taking their time to be interviewed.

I would like to thank my mom, Lise Heimdal Holm for helping finding the teachers and Stinna Gammelgaard for helping transcribe some of my interviews, it really made a difference. Thank you to May Anne Then for proof reading my report, when I needed it the most.

Last, I would like to thank family and friends for listening and helping me when I needed it the most.

Lærke Heimdal Holm

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1. Introduction

In August 2014, the Danish government implemented a new public school reform. There are different reasons for the Government for making a reform, a main one being that the schools have problems with achieving a sufficiently high educational level of reading and math. Among the students, 15-17 % do not have adequate levels when they finish public school and many students require so-called special education. Besides having academically weak students, Denmark also has the issue of not having too many academically strong students (Kommunernes Landsforening 2013).

To increase the academic level, the Government has set the following targets:

- Public schools should challenge all students, so they all can be as good as they can be.
- Public schools should minimize the importance of social context in relation to academic achievement.
- Confidence and well-being of the children in primary schools should be strengthened, including respect for professional knowledge and practice.

To achieve these goals, the Government made three focus areas:

- A long and varied school day with more and better teaching and learning.
- Improve Competence level of teachers, pedagogues and school leaders.
- Clear objectives and regulatory simplification.

The first focus area is most significant to my thesis. The reform states that the school week have to be longer, varying between 5 – 9 hours more per year, details see table 1.1 below (Kommunernes Landsforening 2013).

Table 1.1: Showing the difference in hours before and after the reform (Kommunernes Landsforening 2013, modified).

Proposal for a revised school week

subject	Reform	1 th grade	2 th grade	3 th grade	4 th grade	5 th grade	6 th grade	7 th grade	8 th grade	9 th grade
School week in hours incl. breaks	Before	21,1	21,8	24,5	24,5	25,4	25,7	26,6	30,2	28,4
	After	30	30	30	33	33	33	35	35	35

One of the reasons for having longer school days is to make sure all students are getting at least 45 min of exercise every day, and that all students get the help they need for their homework. Educate teachers so they can give stronger subject-based lessons and different ways. That will strengthen the skills the student need in the future, which means the skills a ninth grader has today, is what the eighth grader will have in the future. To achieve this, teachers have to use practical and application-oriented teaching methods, varied and differentiated forms of learning that challenge both academically strong

and weak students. In addition, they have to work with the student's social skills, motivation, well-being and versatile development. Another element in the reform is that the so-called 50 % rule will be deleted. This means that teachers no longer need to spend 50 % of the time teaching courses in the classroom (Kommunernes Landsforening 2013). Instead they may, spend more time outside the classroom, e.g. in nature.

Children today are spending more time inside in front of a screen than children was 15 years ago, which means fun and healthy outdoor play is becoming a thing of the past. Hansen (2004) writes it is important to get the kids out in nature, because kids that spend their life sitting in front of a computer lose their sense of direction. He also suggests that being in nature is not as normal for the Danish people as it is for the Norwegian people, because we do not have as much untouched nature, but for the Danish people being in nature is still important. In his opinion, the desire to be in nature has to learn and it is important to start before the kids turn 5 years old. We cannot start in 9th grade, because then the body is not used to being in the nature and that means that the student will have problems enjoying being in nature (Hansen 2004).

Kjeld Fredens (2006) write why it is important to teach in nature, what the difference is, compared to classroom teaching. He states that things in the physical space speaks to us while experiencing and understanding is stored in our memory, in our personal and mental space. When we have experienced something, when we remember it, then we have learned - a learning experience we could call it. The personal learning experience is linked to time and place, not at least to the feelings associated with it. This memory is particularly dependent on the situation you have learned, and we have to expect that the memory is strong in the outdoor space. What he means is that because we have stronger feelings when we are in nature, we will have a better learning experience when we are outside, compare to learning inside.

Following this logic, using nature as a learning tool is more important than ever. Children are spending more and more time inside not connecting with the natural world or each other. Statistically, children have become more aggressive and isolated over the last couple of decades (Orr 2002). To get the children back on the right track connecting with nature, it needs to be used more in school, especially now where the school reform where the children have to spend most of the day in school (Kommunernes Landsforening 2013).

In this report, nature is considered as outside the classroom. Nature could be in the yard, just outside the classroom, the most important is to not be surrounded by four walls. Pyle (2002) talks about nature

as something that can be anywhere, even in a vacant lot in the city. It does not have to be out in the forest or far away from the school, small green areas are also okay, because they help with the children's imagination.

1.1 Problem definition

With the school reform, many changes have to be made. Nature can become a learning tool for the teachers. It is proven that children learn better in nature, because they are allowed to express themselves more, and it help with their development. Therefore, I believe that in nature it will become easier to learn, with this, I have the following questions, which I will answer in my thesis:

- How can we improve cooperation between actors with regard to integrating nature into schoolchildren's learning?
- Is it possible to come up with changes to get teachers to use possibilities they already have?

1.2 Delimitations

By limiting myself to one municipality, I limit myself to a few schools. One of my delimitations is that I am only talking to nature guides and teachers from Albertslund municipality. Growing up in Albertslund I know the area very well. Another reason is also that Albertslund municipality have 60 % nature, so it could be interesting how much it is use and can it be used more.

2. Theory

In this chapter, I will describe my two theories, nudging and children in nature, ending up with four different topic that will be used for the analysis of the interviews in chapter 4.

2.1 Children in nature

There has been a decline in how well children are doing. They are getting more aggressive children are being bullied in schoolyards or over the internet. Some of this has to do with the physical exercise the children get. Since 1900, the amount of physical exercise children participate in has declined by 75%; with an average of 4 hours a day spent watching TV and even more playing computer. This adds up to the problem where schoolteachers are experiencing problems with getting children to sit still and learn (Orr 2002).

There are many problems with nature today numbers are staggering. All over the world beautiful wild nature is declining. It was not until the 1990's that people realize how important it is to protect nature.

In 1998 in the Philippines, 44 children made a lawsuit on behalf of future generations. They tried to dissolve cancel the agreements between the multinational timber companies and the government. The court ruled that this was possible based on the responsibility of planning for future generations when it comes to balanced and healthy ecologies. The idea that the rights to living in a clean environment extending past the current generation was a new idea at the time, mean that the government are thinking short term and this will not give a good fundament for the future generations in the Philippines. It is not easy to comprehend that we have a responsibility towards our children and to their future children. Everybody needs to know we are living in community and have to contribute to make a change in the future. Unfortunately, children today do not grow up with this understanding. According to Orr 2002, a survey conducted in 1997 in the United States of America showed that 37% of adults believe that youth today will make the country a better place. The rest believe that youth are spoilt, violent, rude and irresponsible. 90% of participants also believe that the values from society is not passed on to the youth today and only 20% have confidence in parents today as good role models for their children (Orr 2002).

Political Economy is the study of the way the public organizes economic production, and the political processes that disturb it and are affected by it. Most of this has to do with children experience in nature. In the modern world, political economy revolves around economic growth. Orr's (2002) argument up-bow shows that there is a problem with the state of nature and children wellbeing. He states that political economy has shifted children's focus in the following ways:

- From direct contact to nature to abstract and symbolic nature.
- From daily contact with animals to contact with non-natural objects.
- From engagement in community to isolation.
- From less to more violent.
- From exposure to reality to virtual reality.
- From slow pace to fast pace.

These make children more distanced from nature, shaping them to place importance in materialism, economic growth and human domination in nature. Children's' view on nature is getting more abstract and utilitarian, which means they are losing touch with nature (Orr 2002).

There is a natural motivation in children to explore the natural world. Verbeek and Wall (2002) wrote about human's primate instinct to explore the world we live in. We use emotions to learn about and from nature. This is called biophilia; a result of our evolutionary past and shared ancestry with other

modern primates. When visitors in Chicago Zoo were asked about the monkeys, most people talked about the human-like expressions and the interactions between mother and infant. People were reluctant to talk about sexual behaviour and aggression. When they were asked about the statement, “humans are primates”, most people were surprised and only a few accepted it. Some even tried to distance themselves from the monkeys. Biophilia is more than fascination with primates. Universal values show our kinship with nature which we learn during childhood and youth. Different studies show young children being especially attuned to animals. Children as young as six years old can sort natural from human-made stimuli. This recognition of living things is automatic and instant (Verbeek and Wall 2002).

This theory of nature in childhood personality and character involves connecting three levels of experience with three means of learning (Kellert 2002). The three levels of experience are the ways a child can explore nature. They are all connected to the three modes of learning, as shown below, figure 2.1.

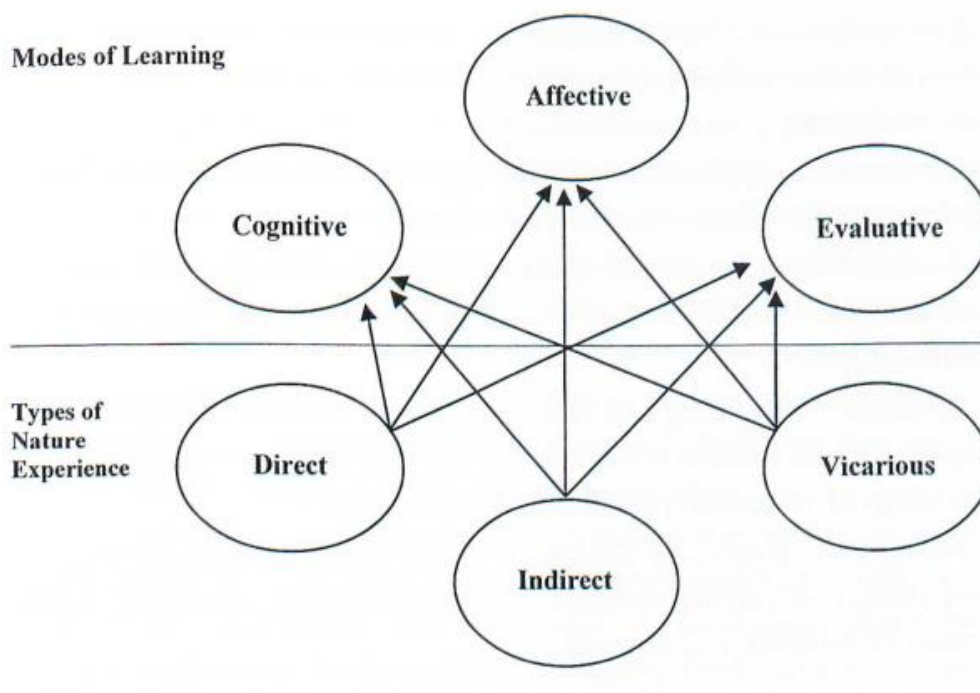


Figure 2-1: type of nature experience and modes of learning in childhood development (Kellert 2002).

‘Indirect experience’ is still an outdoor experience, but it means being in nature in a more restricted and managed way, for example, when going on a school trip. The last experience is called ‘vicarious’, which is a symbolic way of experiencing nature. This occurs when it is not possible to go out in

nature, when children can experience it through other means, like through book or pictures. Children develop nine different values while growing up with nature (Kellert 2002).

Table 2.1: This table show the nine different values and what they stand for (Kellert 2002).

Value	Definition
Aesthetic	Physical attraction and appeal for nature
Dominionistic	Mastery and control of nature
Humanistic	Emotional bonding with nature
Moralistic	Ethical and spiritual relation to nature
Naturalistic	Exploration and discovery in nature
Negativistic	Fear and aversion to nature
Scientific	Knowledge and understanding of nature
Symbolic	Nature as a source of language and imagination
Utilitarian	Nature as a source of material and physical reward

The values are developed in three stages during childhood. The first stage occurs from three to six years old, and it is when the child can develop the utilitarian, dominionistic and negativistic values. At this point, it is all about the child’s interest to satisfy its material and physical needs, avoiding hazard and threats and learning how to feel comfort, control and secure. At this age, almost all children show total indifference with animals and plants, except with family pets and natural settings (Kellert 2002).

The second stage occurs from age’s six to twelve, and is the most important one. This stage is when the humanistic, symbolic, aesthetic and the knowledge components of scientific values are developed. The first three values will fade into the background. Around this age, children become more comfortable with family pets and natural settings. Children will begin to recognise “different-ness and other-ness” of the natural world. They will start showing care and interest for other creatures. They will expand their world and explore their surroundings, find new places (Kellert 2002).

The child will increase their knowledge and understanding on nature, which will help develop critical thinking and problem solving skills. This will also help develop intelligence, which is important for children at this age. Children will start to make an identity separate from their parents and their home. All of these things will give the child a feeling of independence and confidence. Children will be

interested in making things, for example forts, as a special place outside their home, a place from where they can explore, learn and grow (Kellert 2002).

The last stage occurs between thirteen and seventeen years old. This is the stage when a child develops the last values of nature: moralistic, naturalistic and the ecological components of scientific value. This is when children become familiar with the bigger picture, ecosystems, landscapes and evolutionary processes. They will also start to understand the concept of ethical responsibility towards nature, and see more abstractly and systematically, like the complex relationship between human and nature. Almost pre-teens at this age like to engage in daring, expansive and challenging activities in nature to test their limits. In the process, they develop confidence, self-esteem and increase their sense of identity (Kellert 2002).

These values are a part of a bigger theory. Direct experience means physical contact with nature, being outside, touching plants and animals.

Cognitive learning is about the formation of thinking and problem solving skills. There are six stages of cognitive maturation, moving from simple to complex stages:

- Knowledge – understanding facts, terms and develop a broad classificatory groups and systems.
- Comprehension – construing and understanding information and putting them in the other circumstances.
- Application – applying general concept to different situations.
- Analysis – putting knowledge into categories and organizational relationships.
- Synthesis – integrating part elements into organized wholes, understanding of relationships.
- Evaluation – giving judgement to vary elements, based on examination of evidence and effects.

Some evidence show that experiential contact with nature has an impact on cognitive development, especially during middle childhood, around age six to twelve years. Even in the city, children encounter many different environments, which will have significant impacts on how a child sees the natural world. In schoolbooks for younger children, there are often pictures of the natural world, more than there are pictures of pencil, telephone or other manmade objects. This also helps nurture cognitive development (Kellert 2002).

Effective development is children's emotional growth in middle school and youth. There are five stages of emotional development:

- Receiving – being willing to receive information and being sensitive to facts.
- Responding – achieving gratification from information.
- Valuing – accrediting importance to information that reveal clear preferences. Organizing – coming up with preferences of worth and putting them into consistent patterns.
- Characterization by a value or value complex – holding on to beliefs and values on a steady worldview of life.

These stages include both emotional and value development, but in figure, 2.1, it is about the emotional development. It is about how a child is able to interact with the world, which depends on the emotions of the child. What they like and what they do not like. Childhood memories are often related with much emotion, which shows their importance.

It is important to realize with these different modes of learning that children need to be outside and experience nature first-hand. They will never get the same experience by looking at nature on a computer or Television. Children will get the best understanding of nature with personal and intimate contact during their upbringing (Kellert 2002).

Chawla (2002) writes about how adults remember their childhood experiences with nature. She found out those adults who accept scientific rationalism recounted memories of nature seen as childish nonsense or irrelevant information. Others believing in nature as a living organism recounted that childhood was a time of insight. Most science concerning children and nature focus on environmental reasoning, knowledge and attitudes. These are important to children when they trying to understand the world, but they cannot give children their deepest connection with nature. For this, they also need to get a sense of environmental sensitivity, where a child gets a positive perspective on nature and natural areas. Children need to play, destroy and build outside, like making mud-pie and sandcastles. They do not need exposure to houses, cars, the sun or the moon. Children with attention-deficit disorder or children that just have a hard time sitting still for a long time can learn better if they are outside. Chawla (2002) write about a study where 96 parents rated their child's symptoms. The results showed that children with greener environments had less symptoms and functioned better in social settings. A study in Chicago showed how low-income children played more in spaces with more trees than places with less trees and that play was a lot more creative in areas with trees. The study found that green areas in inner-city neighbourhoods made people use the outdoors more (Chawla 2002).

Children can play with anything anywhere, but research suggests that the environment affects the quality of play. Children who played in the greener part of the schoolyard showed less aggression and more imaginative play. Another reason why it is important for children to spend time in nature and natural places is that their environmental attitude toward protecting nature will increase. This is supported by a survey, which showed that in 1100 nine to seventeen year-old children, those who have been hiking, camping or taking care of pets while growing up would find it important to protect nature (Chawla 2002).

Pyle (2002) writes about nature in a different way than Chawla does. For him, using nature can be anything, including children playing in a vacant lot in the city. As a natural historian, he did not get his interest in natural history from school, except through one teacher who created an after-school ecology club. He writes that while children may be able to do water-quality tests and other modern techniques, they may not understand the connection everything has with each other. Most children nowadays do not have basic contact with nature around schools. Parents today are more protective of their children, it will not hurt the children in the long run that the parents do not realise that getting cuts and bruises is a way children can learn about life, which. This can set children back because they are prevent from playing outside to avoid getting hurt (Pyle 2002).

Planners today design playgrounds and places for children, but children do not need much to get them to play outside. They are good at using their imagination, like making mountains out of small hills. Therefore, it is important that planners not overthink the details when designing a park or a playground, because children's imagination can run wild (Pyle 2002).

Pyle (2002) also writes about how adults look back on a special place where they could play when they were young. For some it was a green area near their house and for others it was a vacant plot in the city, but for all, it still brings back emotional memories especially if the spot is gone now as an adult. This gives a stronger feeling of protection of these places and nature in general. There are different ways to save children's special places, and at the same time give them a sense of how important it is to protect something special and making them interested in the outside (Pyle 2002).

- Let children talk about their places
- Take a walk outside to make an inventory
- Try to influence the planners for the area
- Fight for the places you want to keep, let your children help you
- Make sure park areas are not 100 % planned, but some of it is left as "wild land"

- Get others that are interested in the areas to show the kids around, without leading them, but just making sure they are safe
- Try to limit the time spent inside with children
- Encourage environmental education programs
- Make child-friendly habitat and corridors where they can explore and play
- Try finding the special and rare plants in the local area

By trying these ways, children can get a different perspective of nature, using techniques easily now a day. Which means they learn about everything online, a class trip in a virtual nature. Which distance children even more from the natural world (Pyle 2002).

Hansen (2004) is a Norwegian writer who wrote about getting children into nature. He wrote about how children today are spending a lot of time in front of their computers just like Orr's (2002) theory. In Denmark we don't have as much untouched nature as compared to Norway, but the Danish people still use nature a lot and finds it important. As Chawla (2002) writes, green areas in the city is enough. Hansen (2004) also wrote about how it is important to start early, because children using nature in ninth grade will be more resentful and less receiving to learning in and about nature in lower years.

Hansen (2004) writes about how we learn through our bodies and how children use their senses to understand the world. According to him, we learn to have two different bodies, one for school and for playing. The one for school demands discipline and the one for playing encourages big movements. When children spend their childhood sitting in front of the computer, they lose their sense of time and space, because they do not use their playing body in the right way.



Picture 2-1: This is Vestskoven a cold winter day. It show the forest not being that old and untouched (private photo).

Fredens (2006) writes about the importance to teach in nature, he is not saying all teaching should be in nature, be it would be good to use nature to supplement teaching in classrooms. He also writes about how it can be difficult to reach the teacher's goals in a year if they also have to spend time outside, but it should be possible to reach these goals even when using the outdoor space. He write about different benefits there is with outdoor schools.

- You learn about nature when being in it.
- You learn easier if you work with it in your hands
- You remember better, when it is connected to an experience and specific activities
- Nature is a good room for learning though activities
- Recreation gives a natural science education
- Nature is a room full of possibilities
- Outdoor children are more healthy than indoor children, the forest and nature is a drug without any side affects

The list could be so much longer, it is important when talking about outdoor schools not to talk to about the different terms but look at it as a whole. Its ideas like nature, outdoor spaces, concrete

activities, community, experience and action, learning, professionalism, personal development and health, to name a few important ones (Fredens 2006).

It is important for the children to be outside because it can help to experience things while learning about them. A 'learning experience' is linked to the time and space we are in and gives us a physical memory of the learning. The outdoor space can give a stronger memory than sitting in a classroom would. Using the outdoor space as a classroom is called 'outdoor school'. The name can create problems, as some people think it means that they have to spend all the time outside, but this is not true. It is just as important to spend inside, but the teaching should be connected with the outdoor, while preparations can be made inside (Fredens 2006).

An American study showed children spending an average of 44 hours in front of an electronic screen per week. The amount of time children spend in front of a screen is severely out of balance. This can have different side effects, like shorter attention spans, increased aggressive behaviour, higher chance of stress and depression and isolation (Coyle 2009).

When children spend a lot of time in front of a screen they get overstimulated, this can give a shorter attention spans, but this is not the only problem it can give there is also nerves, blood pressure and bad vision. All this mean children will have a harder time settling down and concentrating in a classroom. Some children will get increased aggressive behaviour if they spend too much time in front of screens and just being inside. When time spend outside give a calm effect in children. They learn to communicate and cooperate with playing unstructured outside (Coyle 2009).

Today when children leave home in the morning, they have a full schedule for most of their day, after school, they have football, dance or something else. Many children today do not have a lot of time to play and relax. This can lead to a higher risk of stress and depression, not just later on in life but also from a young age. Emotional development in children is effected if the children do not get to play freely. Isolation is another problem; children become isolated when playing computer games and watching television. When children are playing outside together, they have to set rules, interact with each other, which help their development (Coyle 2009).

Children can get other indirect problems if they spend too much time in front of a screen. They spend a lot of time sitting down, not doing any physical activities, which can lead to other problems like obesity and vitamin D deficiencies. In Denmark like in America, there is a rise in obesity in children in the last couple of decades (Sundhedsstyrelsen 2011).

There are different solutions that the school can use. Recess is important as this is the time where children can have unstructured play outside with each other. This can help with the child's development. The schoolyard can also affect the way children play during recess as Chawla (2002) writes. Greener areas makes children less aggressive and use more imagination when playing, so schools should have less paved schoolyards and more natural areas where children can play more freely. If the schools have the space they could even make school gardens, where they children can learn about how plants grow and where their food comes from (Coyle 2009).

Bendix and Barfod (2012) have made a booklet on how teachers can use nature. It shows how children can benefit, the practicalities, examples and much more. The booklet writes about how to be an outdoor teacher:

- Desire – it takes more energy in the beginning to be an outdoor teacher, but when the routines and knowledge gets better, it will become easier.
- Responsibility – the teacher has the responsibility to ensure children learning, so it is important to make sure the activities outside is connected to the activities inside.
- Get parents involved will make for great teaching partners when needed, as they can get their children more interested in nature.
- Two teachers working together is best, where one can ensure safety outdoors. It can be an extra teacher or two subject's teachers working together.

All children learn in different ways, this is why it can be difficult for some children to sit still inside a classroom and listen to a teacher, it is not because they do not want to, but they just do not know how to. Schmidt (w. y.) writes about how all people learn in four different ways, seeing, listening, touching and doing.

The children that uses 'seeing' as the way of learning prefer written instructions, through PowerPoint presentation, blackboards and books with pictures. They are good at understanding written instructions, remembering what they have read, expressing themselves on paper and using pictures to describe their experience. A child using 'listening' likes to listen to the teacher, listen to books instead of reading them and to express themselves orally instead of on paper. They are good at discussing, retelling something they have heard before and to be a part for a group. A 'touching' child prefers to do exercises where they can use their hands, work on a computer and to work with specific materials. They are good at writing and drawing, practical lessons and at remembering if they are underlining keywords or taking notes. The last child learns best by 'doing'. These children prefer to move while

learning, use many different senses at the same time and to make experiences. They are good at working with their hands, to make models and building and are good at sports, dancing or drama (Schmidt w. y.).

These four different ways of learning can again be divided in two different groups, because people either do things in (1) detail or (2) overall terms. This is the way they best solve an exercise (Schmidt w. y.).

The child that thinks in detail is good at planning, reading quickly, remembering facts and names and can solve logical exercises well. They prefer to have order, to start quickly, to go through the text systematically to make sure they understand and solve everything. The child that thinks in overall terms when solving an assignment is good at creating picture in their head about what they are reading about. They are good at doing multiple assignments at the same time and they are good at coming up with alternatives to solutions. They prefer to start out with getting an overview of the assignment, to work with multiple assignment at the same time and to follow their intuition when solving an exercise. Finding out about how children learn in nature could be can be important, because being outside gives children opportunity to do more than just listen to the teacher (Schmidt w. y.).

2.1.1 An example on children and nature

In Sweden, a study has been done studying how outdoor education affect s children. The study is about two schools, one that uses the outdoor and the others does not. The children were from pre-school to sixth grade from Linköping. The first year-one school did pedagogical intervention, while the other one did not do anything. The data was collected over two years. 230 children took part in both years. It is important when looking at the differences between the schools, that the school in the city, reference school, have higher percentiles of students from low socio-economic backgrounds (Gustafsson et al. 2011).

Table 2-2: showing the demographic information for the two school used in the study (Gustafsson et al. 2011).

Demographic information by school (<i>n</i> = 230)			
	Intervention school (<i>n</i> = 121)	Reference school (<i>n</i> = 107–109)	Test, <i>p</i> value of difference
Gender, % girls	43.8	48.6	χ^2 , <i>ns</i>
Age, mean (SD) years	8.6 (1.6)	8.1 (1.5)	<i>t</i> -test, <i>p</i> = .021
Socio-economic status			χ^2 , <i>p</i> < .001
Low (%)	17.4	67.9	
Middle (%)	41.3	22.9	
High (%)	41.3	9.2	
Immigrant parents (%)	0.0	64.5	χ^2 , <i>p</i> < .001

The approach used was as written before pedagogical intervention. This was to foster learning with experience and reflection. The teachers were given exercises they could use in mathematics, natural sciences, arts, language, music, drama and physical education. Some of the teachers at the school had already used the outdoors. The reference school is using traditional methods, book-based and paper-pencil work in a classroom inside (Gustafsson et al. 2011).

The study was to see how outdoor education affects the mental health of students. The result was surprising as it showed a difference between boys and girls. The girls at the reference school had a decline in mental health while the girls at the intervention school had no change. The boys at the intervention school had great benefit from the outdoor education. The mental health is important for the children's performance in school (Gustafsson et al. 2011).

There were some limitations with the study. The results also showed that the reference school could have had a lot more benefits from the intervention, because it is located in an urban school area, with a high percentage of low-income households. Whereas the children from the intervention school were all Swedish children, and from an environmentally and socially privileged area. The schools were still comparable, however, as they were located in the same municipality and the children were similar in age (Gustafsson et al. 2011).

The timeframe was chosen because of practical constraints, but it did not give the intervention school much time to assess the effects of the intervention on children's mental health. If the school would have had more time, then it could have had greater results. The result that boys have greater benefit from the outdoor education need to be further examined (Gustafsson et al. 2011).

2.2 Nudging

'Nudging' is a term that is used to describe steering people to change behaviour, for example to stop critical public problems, like stopping global warming, changing people eating habits. People can use a "choice architecture". It is not always enough to give people the information they need to change behaviour, they need a "choice architect" (John, Smith and Stoker 2009).

A "choice architect" is a person that have the responsibility for organizing the environment in which people make choices. It is important to know that there is no neutral settings, somebody in one way or another makes all settings. Choice architecture is the setting in which people make their choices. Even the smallest details can affect how people interact.

Nudging has become a popular strategy for public authorities around the world to change peoples' behaviour. John, Smith and Stoker (2009) identified five ways of changing civic behaviour:

- Citizens often have an avoidance option that they revert to in the absence of a strong signal.
- Policy-makers should presume error and design systems so the citizens learn immediately.
- It is important to give feedback in a timely and effectively manner, so people can understand the effects of their actions.
- Encourage the adoption of mind maps that facilitate better decisions.
- Provide opportunities for collective filtering so that people can learn from others about what works or what the tendency we have to follow those whom we regard as like-minded.

Humans can be bad at making choices. Smokers, drinkers and overeaters are willing to pay others to help them make decisions. Another example is how people forecast how long it takes to complete a project. Studies show human forecasts are flawed and biased. People are willing to stay on the status quo as long as possible, this is called status quo biased. Policy makers can use this to nudge people in to making better choices. It is important not to underestimate the power of inertia. Public officials and private companies think that a policy that is chosen by default gives better outcomes. A good example is organ donation. We could save so many more life, if people had to say no to organ donation instead of yes. Well-chosen default options illuminate the gentle power nudging (Thaler and Sunstein 2008).

Another way to influence people is with incentives, one example is to make the tax for candy higher, then people may choose to buy less candy. If public policy makers use both incentives and nudges well, they can improve the quality of people's lives and solve many of society's problems and it can be done without removing people's freedom to choose (Thaler and Sunstein 2008).

The reflective system and the automatic system is the way humans think. It is two different ways of thinking. The reflective system is contemplating and rational, the automatic system is instinctive and intuitive.

Table 2-3: this table show the two different system, automatic and reflective (Thaler and Sunstein 2008).

<i>Two cognitive systems</i>	
<i>Automatic System</i>	<i>Reflective System</i>
Uncontrolled	Controlled
Effortless	Effortful
Associative	Deductive
Fast	Slow
Unconscious	Self-aware
Skilled	Rule-following

The automatic system is rapid and feels instinctive, it is not what we would call thinking. It controls the things we do without thinking about it. The reflective system is deliberate and self-conscious. It is what we would call thinking. When people speak their native tongue, they use their automatic system without realizing. People can rely too much on their automatic system, but if people speak a foreign language, they have to use their reflective system.

Most of our lives are complicated, we cannot spend all our time analysing every single thing. That is why we use rules-of-thumb to help us. These rules can be helpful, but they can also make us biased. Thaler and Sunstein (2008) writes about three rules of thumb: anchoring, availability and representativeness.

‘Anchoring’ influences the way you think about your life. If you had to guess how many people there were in the city, you would overestimate if you came from a city with a high number of citizens and you underestimate if you came from a city with a low number of citizens. For example, if a person from a Copenhagen suburb had to guess how many people lived in Frederiksberg, they would guess based on the citizens living in their own city, so a suburb with 25.000 people would maybe guess three times the people, so 75.000. If you asked a person from Copenhagen, the person would maybe guess a third of Copenhagen, so 300.000 citizens, because the person from Copenhagen comes from a bigger city, they have a bigger anchor (around 100.000 citizens’ lives at Frederiksberg). This is called

“anchoring and adjustment”. You start with your anchor and then you adjust from that (Thaler and Sunstein 2008).

‘Availability’ is about how people assess risk. If some people have just experienced a hurricane, then hurricanes will be seen as a bigger risk, then other dangers. If a risk is familiar, it is seen as more severe than less familiar risk. Accessibility and salience are closely connected to availability. If people have a personal experienced with a danger, then there is a bigger change for this risk then if they read about in a newspaper. The automatic system is the one aware, maybe even to aware. The availability heuristic can explain most of the risk-related behaviour, both public and private decisions. Assessment of risk influences everything in life and are usually biased regardless of whether it is about a crisis, politics or business. This can be used as a nudge, reminding people of the risk when things went wrong, or a way to increase people’s confidence by reminding them when things went well (Thaler and Sunstein 2008).

‘Representativeness’ could be called similarity heuristic. It is about when people are asked how likely is it that A belongs to category B, people will answer how A is similar to their stereotype of B. here again is where the automatic systems mostly take over. Representativeness heuristic can lead to misperceptions of patterns in everyday life. As with playing with a coin, people see patterns even when they know they should not. Representativeness can have bad effects. Where people can overestimate their personal risk of being harmed. People that run risk because of a too much optimism could do good with a nudge, like reminding them of a bad incident (Thaler and Sunstein 2008).

People hate losing and love gaining something. Losses make people want to stick with their holdings as much as possible. People tend to stick with the status quo, for example, children will sit in the same spot every day if there is no sitting chart (Thaler and Sunstein 2008).

The way things are framed is also important if people have to change behaviour. Choices depend on the way a problem is stated. Framing is important because people can be mindless passive decisions makers. The reflective system does not do the work required to check all options and to check to reframe the problem. For example, people hate losses, if there are told that they will lose money every year if they don’t use energy conservation, the campaign to get people to conserve energy is much more effective, than if people were told that they would save money every year using energy conservation. A loss can help produce a desire to hold on to your belongings. Framing is a powerful way of nudging, and has to be used with caution, as using it the wrong way can have terrible consequences (Thaler and Sunstein 2008).

Nudging is a way to help people in a highly complex world. Nobody can make every choice consciously, which is why people make rules. These rules can lead people astray, because they have limited attention. This makes people open for nudging (Thaler and Sunstein 2008).

As Wilkinson (2012) writes, it is important not to use nudging blindly. If it done in the wrong way by the government, it can be seen as manipulation, not nudging. He writes that the publicity principle has to be elaborated. Thaler and Sunstein (2008) talks about how transparency is most important when it comes to the publicity principle and that the government has to able to defend it. Wilkinson (2012) has a problem with this because it does not say how they should defend it. He talks about how nudges is only objectionable when they cannot monitor the process, that there have to be informed critics and they have to inform the public. Governments that are committed to publicity and transparency cannot use nudges that are objectionable, because we cannot be sure that, the government will ever be fully transparent or if this will take away the government motive to manipulate. What Wilkinson (2012) is saying is that we cannot believe that a government will be completely honest with the public and this is why nudging can be seen as a manipulation tool.

It is difficult to show if nudging is manipulation, because manipulation is difficult to formulate into a concept. There are many different ways to manipulate people, depending on the view, psychology, communication study or marketing. Manipulation is a negative thing unless it is used to prevent somebody from getting hurt. Manipulation have an intention condition, this can help with explaining why manipulation is wrong, if somebody's belief came about by being lied to, then his or her autonomy has been abused. It is wrong when manipulation makes us act against our interests. Thaler and Sunstein (2008) argue that their nudging is libertarian, meaning that people should not be the puppets of others. This implies that it would be a drawback if nudging was manipulating, which Wilkinson (2012) also agrees with. This does not rule out manipulation from nudging, but it would make nudging tough to justify in many cases.

2.2.1 An example on nudging

Kathryn Anderson-Levitt (2012) writes about how nudging can be used to get teachers to use the best practice possibility. She writes about how good it feels for a teacher when a student finally understands the mathematical concept they are working on. The article is about ways to test how good a teacher is, with teachers from different countries including the United States, Norway, Indonesia, Korea, France, Guinea, Ghana, Czech Republic and many more. She writes about how the overall curricula is the same all over the world, but there are differences in practices when looked at closely.

For example, how many hours spent on math or the number of years children have to go to school? Another difference is in how the lessons are being used. Czech teachers spend 40% on review from the previous lessons, while the teachers in Japan only use 10% of the lesson on review.

The article tries to use a test from the US, to see how good of a practice the teachers are, by looking at how good the students are. The problem with the test is that it is in English and created by US standards, which makes it difficult for teachers in other countries to use. The biggest problem was also how the teachers reacted to the test. The test was a nudging tool. The article is a good example on how teachers rate differently. Even though it is about teachers from different countries, it could just as well be teachers from different schools. You will have some teachers who will use the test to improve and some will argue against it (Anderson-Levitt 2012).

In Ghana, the test gave the teacher new ideas to make the students make their own algorithms. In Korea, the teacher was against the test and argued against using it, instead of improving their own teaching (Anderson-Levitt 2012).

The best way to find the best practices in each country is to identify the best teachers in the country and explore what knowledge and practices these teachers use (Anderson-Levitt 2012).

2.3 The framework for the analysis

Interviews are not easy to analyse, but by setting up a frame, I can connect the theory with the interviews. My interviews are in Danish, but I will be using them as quotes and therefore will translate them from Danish to English when using it in my analysis. I have four different topics I want to look at the school strategy, barriers, possibilities and solutions.

2.3.1 The school strategy

My first topic in my analysis will be on the strategy for the school system in Albertslund municipality. I will begin by explaining the different themes and goals in the strategy to give a better view on what the strategy is about. It is important to look closely at the strategy because the municipality will make decisions on how to make changes to the school system by looking at where they have to end up. This means that any changes that can be made to get the teachers to use nature more have to fit within the strategy.

I will use nudging to analyse it. Nudges can be used by giving people different choices (without giving them too many). It is important to teachers choices, but with them thinking about them. It might give better result for the municipality if they used nudging.

People have two different systems, the reflective and automatic system. Nudging is a way to get people to change their automatic habits, without thinking about it, like breathing. First, I will try to see if the municipality can make a useful frame, because if the framing is good, the teachers will naturally choose the way the municipality wants them to do. The reflective systems does not check all the options it has, it will naturally choose the one closest to the status quo or something better than status quo.

Availability is also something to look; at it means people are affected by their experiences, like the example about hurricanes. If the teacher has had a bad experience with nature, they would not want to use it again. In this case, it would be a good idea to remind the teacher about good experiences. It can also help reach the goals in the strategy, which is the most essential focus for the municipality. At the same time, the teacher would feel that somebody was listening. I will use this to talk about the teacher's bad experience (Thaler and Sunstein 2008).

Representativeness is also something to look at, people can see risk or patterns where there isn't any. Teachers may think all children will behave badly if they tried it on school trips a couple of times. The municipality may also see patterns where there isn't any, so it is important they do research to find out what is the best choices, to reach the goals of the strategy. I will look at the last two themes of the strategy and see how the teachers perhaps see patterns that aren't there. This will be connected to the framing of the strategy (Thaler and Sunstein 2008).

Wilkinson (2012) writes that the municipality has to be careful when it is using nudging. They have to make sure that there is transparency and trust when they are using it or else the teachers can feel like they are being manipulated into doing something they do not want to do.

2.3.2 Barriers

The second topic for my analysis is barrier, which looks at the barriers teachers have from using nature in their teaching. This is the most important subject in the analysis, because finding out what the barriers are can lead to solutions that can overcome them. My analysis will show that teachers do have barriers against using nature. I will use both nudging and theory on nature in childhood.

Anchoring is a part of nudging and gives an idea of where people are coming from. This part of nudging can look at what the background of the teacher is and how this affects their use of nature. Looking at the teachers' choices, can show if their automatic systems can be influenced to use nature more, without the teachers feeling like they are being forced. Another thing to look at is where the

teachers are coming from, what their education background is and whether they have connections to nature in their lives (Thaler and Sunstein 2008).

By using the theory about nature in childhood, I will show how teachers can use nature more. The theory about nature in childhood development, showed three ways a child can experience nature and three modes of learning, cognitive, affective and evaluative development. The theory has three different ways a child experience nature. Figure 2.1 shows how all three ways of experience is connected with the three modes of learning and how all of them is important when looking at the way children learn about nature while growing up. Kellert (2002) writes about how tendencies in modern society, such as loss of biodiversity and chemical contamination, reduces the quality of children's experience with nature which has consequences for the way teachers teach. By using this theory, I will argue that the teacher are not using nature in a balanced way right now, and show what is missing and where the focus should be in the future.

I will also look at the different stages in the evaluation development and see how the three stages can be used to find out what the teacher should be focus on. There are three stages for different age groups, and these age groups could be moved a little and used on the different years in school; so first stage is for first to third grade, second stage is for fourth to sixth grade and the last stage is for seventh to ninth grade. This can help teachers find out where the children are in their development on nature and how this can be used to get children out into nature.

The theory can help explain what the teachers need to focus, which direction they have to go to get the balance back. Specifically, the different stages in the evaluating development can help the teacher to look at what focus should be for pre-, middle-, and elementary school. They can help teachers get past some of the barriers they have with using nature as a learning tool (Kellert 2002).

2.3.3 Possibilities

After looking at the different barriers the teachers have, it is important to look at the different possibilities there is. The two interviews with the nature guide and the webmaster, will be compare to what Chawla (2002) writes about the ways nature can help children who have learning disabilities. Schools with a greener schoolyard have children with less aggression. A study shows that children playing in more surroundings that are natural are more open to playing with other children. Their games are also more imaginative than the games played in schoolyards where there is no bushes, plants, or grass. She also writes about a study in Chicago, were areas with more trees created more

imaginary play among children, and showed a need to be outside more. All of this formed a closer community and a greater sense of safety.

Orr's (2002) argument shows how important it is to use the possibilities that are already there; teachers can make a difference and get the children in better contact with nature. Orr argues that society has change over the last century and that children do not connect with nature naturally anymore. I will show that teachers can make a difference in children learning if they use the possibilities, by using this argument and an example from Sweden.

Verbeek and Wall (2002) wrote about how small children have a natural connection with the natural world, just as primates do, but if they are not encouraged to play outside, they can get disconnected with the natural world, like most children are today. Orr (2002) also writes about this and shows that children are slowly losing their connection to the natural world and are spending more and more time inside looking at computers and television instead. When looking at the different possibilities the teachers have, it is important to look at the age range of the students they are teaching. There have to be possibilities for all age ranges, as children in first grade see the natural differently than children from ninth grade.

Hansen (2004) agrees with this, when he writes about how children need to learn how to be in nature and get used to it, before it is late, in ninth grade. These theories can help with looking at what the possibilities are and if they need to be changed. He writes about how both the playing and the school body is important. What Hansen (2002) writes about connects with what Chawla and Orr are saying.

2.3.4 Solutions

The last topic I will look at is solutions. This topic will connect with all the other topics. Here I will tie barriers and possibilities together, by looking at them one by one. I will see if anything needs to change to help the teacher use nature more. Pyle (2002) argues that even a vacant lot in the city can be of great importance to children. He states that these places can give adults great memories and these memories can give the person a greater sense of protection for the place, especially if the special place is gone when the person comes back as an adult.

Children today is a lot more protected by their parents when they are playing outside, and parents can sometimes overreach if a child is hurt. This does not help the child's imagination, if the parents are nearby all the time when the children is playing. Children need special places that are only for them, something they can look back on and tell their children about later on. These places give them something special to protect from an early age (Pyle 2002).

Fredens (2006) writes about how the outdoor is important, but not all teaching need to be outside. This is very important to look at when talking about solutions. Learning experience can be used when talking about using the outdoor. A good learning experience can help children remember more and thereby learning more, so by finding a balance between the outdoor and the inside children can get the most out of school.

Coyle (2009) writes about different solutions that can help with children that are spending too much time inside. He writes about a study in America that shows children today spend more time inside than outside and how this has different side effects. The solutions they write about are not just solutions to the physical problems but also to children learning better. Some of these solutions could be ideas for the teachers to spend more time outside.

Bendix and Barfod (2012) made a booklet that consolidates all of this. It shows how everything can be done, the practicalities, ideas, examples and so on. Everything a teacher needs to get started.

Schmidt (w. y.) writes about different ways of learning, and how these learning methods can connect to the use of nature and this way maybe give the teachers a good foundation to build from. Looking at the different solutions to see if any of them can be combined with the theory on learning methods.

3. Method and case

With implementation of the new school reform, several changes have to be made to the public school system in the years to come. This will not be easy for the municipalities, the schools or the teachers at the schools. My case focuses on the Albertslund municipality, one of many suburbs located just outside Copenhagen.

Albertslund has an area of 23 km², of which 60% is regarded as natural areas. Albertslund was built during the 1960's and 1970's as one of the first cities without skyscrapers. Since its founding it has made good use of what was available, and won numerous environmental awards, the newest one being Nordic energy municipality 2011.



Picture 3-1: This is Brillesøen in Albertslund one of many lakes around the municipality (private photo).

Albertslund has four public schools and I interviewed four teachers from two of these schools, Herstedlund and Herstedvester. It was important to interview teachers that teach different grades and different subjects, in order for me to understand how the teachers include nature – this also makes this thesis more generally applicable (Albertslund kommune without year).

The nature guides and teachers who were interviewed were made to help with the four different subjects I have included in the analysis. The purpose was to interview four to five teachers and two nature guides, but it was difficult to get the teachers to say yes, and one of the nature guides in the municipality had just retired. The reason for conducting interviews with both teachers and nature guides was to find what was missing, why teachers do not use nature more when it has been proven to be good for the children.

Table 3.1: this table is the interview guide I used when interviewing the teachers.

Interview tema	Interview spørgsmål
Intro af informant	”Fortæl lidt om dit job som lærer her på xxx skole (hvor længe, lærer i hvad)
Status for brug af natur i undervisning	Hvordan bruges naturskolerne pt. i børns læring i skolen? Hvor ofte er du derude med dine elever? Hvilke fag er det knyttet til? hvordan indgår natur konkret i disse fag? Hvilke børn er med derude (fx hvilke årgange?) hvilke lærere er med derude?
Muligheder og barrierer	Hvilke praktiske og organisatoriske forhold (muligheder og barrierer) påvirker hvad du gør? (Det kan fx være adgang til at komme i naturen med bil, cykler osv., Det kan også være skoleskemaernes struktur, osv.) Føler du dig fagligt og pædagogisk ’klædt på’ til at kunne undervise i dit fag i naturen? – hvad skal der til for du gør?
Løsninger	Hvilke praktiske ting skal ændre sig for at du ville overveje at undervise i naturen? Kender du ’Skoven i Skolen’? Ville du bruge det?

Personal interviews give a better understanding regarding the complexity of the problem, but at the same time can be difficult in examining the bigger picture. To investigate my thesis and the underlying cause of the problem, I decided to use personal interviews. Teachers for the interviews were found by asking teachers if they wanted to participate in an interview. Many of them refused, as they were reluctant to talk about the school reform.

The limitation meant that it was difficult to find enough teachers to interview, but in the end, there were four teachers that were willing to participate. The reason I have only included one nature guide in the interview process is that Albertslund only has one nature school, which only has one nature guide.

Another limitation is the way that the interviews were conducted. The interview guides for the teachers were made before deciding on which theories to use. The theory about how children utilize nature is very important for my thesis, but never had any course on children’s use on nature, which means I had to spend extra time on learning the theory first, before using it.

I started out with an interview with Malene Bendix. She is the creator and webmaster the webpage “skoven-i-skolen.dk”. She has been working with nature and outdoor spaces for more than 15 years,

helping teachers gather the information needed to start teaching outdoors. She has a great deal of insight into how things are being run right now and could provide valuable information.

My first two interviews were with teachers Teacher 1 and Teacher 2 on the 17th - 18th of June 2014, both from Herstedvester School. Teacher 1 is 60 years old and teaches first to third grade in Danish and Art. Jette has been teaching for many years, but with the school reform, is unsure how much longer she will continue. Jannie started teaching at Herstedvester School 8 years ago, and just finished a sixth grade class. Next school year she will start working with a fourth grade class, whom she will be teaching until sixth grade. She teaches Danish, history, Christianity and music.

The other two teachers were Joan Yrsa Pedersen and Lene Bjørn Jensen, from Herstedlund School who were interviewed on the 23th and 27th of June 2014. Joan Yrsa Pedersen, 63 years old, was educated at Roskilde University Centre and has been teaching since 2003. She first began teaching in classes with special needs children, and now teach grade seventh to ninth in the three sciences, chemistry, physics and biology. In seventh grade, the students can choose between three different streams, international relationships, craft and design and science. Joan only teaches the science stream. Lene Bjørn Jensen has been a teacher for 38 years. Her background is a little different from the other teachers; she took her education at a Tvind school. She teaches Danish, reading and nature/technique (science) for middle school children. She did not start out having science as a subject, but when the principal asked if anybody wanted additional education in science, she said yes.

After interviewing the four teachers, I interviewed, Henrik Søfeldt Jørgensen, the only nature guide in Albertslund working with teachers in public schools. Henrik Søfeldt Jørgensen has worked with nature and forests for 15 years. 10 years ago, he was asked to help start up a new type of nature school in Albertslund. The purpose of the nature school is to aid the teacher in teaching about the nature, unlike other nature schools where the nature guide takes the class out somewhere for the day.

Besides the interviews, it was important to get some information on what the municipality strategy was for the schools. This is a long-term strategy that the school has to abide by in the following years. It includes different themes as well as goals within the themes. Insights into how the municipality strategies are put together provided the frame for the analysis.

4. Analysis

When completing the analysis, it is important to know what the teachers are doing right now. There is a difference in how much nature is used by the teachers. The two teachers from the Herstedlund School are teaching at least one natural science subject. They talk about being outside as much as possible. Teacher 3 has the most knowledge about nature, and is enthusiastic about the natural sciences. She tries to take her class on small trips outside once a month and big trips ones every quarter.

“I would say I am out on a big trip once a month, no wait it can't be once a month with the big trip, we have the Glim and the Hvalsø trip. The bigger trips are one every quarter.” (Appendix 3)

Teacher 4 is the other the teacher from Herstedlund School and she is teaching science, but she have the middle school, so for her it is important to get them interested in nature and science in general, but she uses nature differently than Teacher 3. She takes what she can find outside with her into the classroom instead. One time they found a dead bird, which she uses in the class after recess.

“For example we found a dead bird in the grass during recess, we took it inside and cut it and dissected it.” (Appendix 4)

Both Teacher 3 and Teacher 4 are trying to show all the different ways nature can inspire children. They would rather use nature than read about it in a book. The two other teachers teach Danish and humanist subjects. Teacher 1 is mostly in nature when she is helping the natural science teacher for the class. She uses nature in art class. She uses different themes, like trolls.

“Sometimes we have a troll theme; I have used that a lot, something with a troll theme. Then they work in clay, and at the same time, we will have a theme week, where we will go out in to nature, where there will be fun thing out there, where I will get some older students to make some fun, they have to catch something, a witch or somebody. Then they can run around with something on their eyes and they can feel something on pots and so on.” (Appendix 1)

Jette also uses nature even when she is not teaching science. Teacher 2 is the other teacher I interviewed at Herstedvester School. Teacher 2 have not been teaching for so long, only 8 years. She does uses the outside, but mostly the schoolyard. She have thought about nature more, but does not do as much as she want to.

“We have been to the nature school almost every year and they have made many different things. Many times, I think that in Danish and history, I could make more use of the outside, like using nature the way I did when I taught the special need class.” (Appendix 2)

All the teachers interviewed had thought about nature and how it can be used as a teaching tool. As Jannie mentioned, she wants to use nature more, but she does not due to some barriers that the others also have. The other two teachers I interviewed were Henrik Jørgensen and Malene Bendix. Henrik is the leader of a nature school that welcome 45.000 visitors every year, 17.000 of which are schoolchildren. Most of these schoolchildren are from first too fifth grade. This nature school does not work like other nature schools, as the children are not guided around by the nature guide every time they are there. As Henrik talks about, the teacher has to be independent. They are the ones that plans what they want out of their time in nature and uses it. Some teachers that are used to a normal nature schools have never taught at this school because they do not like that they have to teach in nature, instead of it being a nature guide.

“It is not like I can work with all these school classes, normally, a normal nature school have, I think Uffe had 3000 visitors every year and we have 45.000. It is not school for all of them, but I can’t take the hand of all of them and be their nature guide, so they have to be very independent.” (Appendix 6)

Malene is the supervisor of the homepage “skoven-i-skolen.dk”. She has worked with both teachers and schools about making the schools friendlier towards nature and talks about how teachers feel about teaching in nature. She talks about how some teachers would go for it if they are given the right tools, but there are teachers that do not know how to use it, because they cannot see why or how their subject can be used in nature.

“I have tried, if people said yes to the premise and only used the nature the amount of times they want to, they really go for it, but there is barriers with some teachers, especially if they think it is only for outdoors people and scouts. However, it is not like that, all subjects have their roots in reality, so it is a natural thing.” (Appendix 5)

Henrik Jørgensen and Malene Bendix have a different view on the use of nature when it comes to learning, they could help with coming up with ideas for teachers to use in nature. They are already trying to help by designing courses, booklets and more. This is why I interviewed them. They have both worked with teachers and know about the barriers that teachers have. Their work is about working together with schools and teachers to make public school better for the children. I will

explore this more when looking at possibilities. The other subjects are the school strategy, barriers and solutions.

4.1 The school strategy

Albertslund municipality have made a strategy for the public schools in the municipality. It was made in 2012 and will be in use until 2022, to be updated in 2018.

The strategy is build up by four different themes:

- Academic skills for all – natural science
- Academic skills for all - language comprehension and reading
- Community for all
- Full speed ahead for all

The first theme is about how all young students leaving ninth grade need to have a strong base in natural science. The goal is to raise the average grades in math, biology, geography and physics/chemistry by one level. The strategy states the ways this can be achieved by providing education for the teachers, establishing a new nature guide position and updating the curriculum with the municipality's environmental plan taken under consideration. The focus will first be on biology and geography, because as the figure below shows, the average of these two subjects is low, compared with the country average (Albertslund kommune 2012).

Table 4-1: This table shows the grades the students received in ninth grade in the school year 2010/2011. The two left columns show the grades from Albertslund municipality and the right column show the country's average.

2010/11	Bundne prøvfag	Prøvfag til udtræk	Lands-gennemsnit
Biologi		5,3 - 6,7 - 7,5 6,9 - 6,2	8,8
Fysik/kemi	5,4		5,9
Geografi		5,8 - 5,8 - 7,2 6,2 - 5 ^b	8,0
Matematik, problemløsning	5,5		6,6
Matematik, færdigheder	6,6		7,5

The latest test results show that Albertslund municipality's grades are average or below average compared to the other municipalities. The ninth grade results will be the comparison from where the municipality will measure the success (Albertslund kommune 2012).

The second theme is "language comprehension and reading". It affects the development a child has, and thereby the possibilities he/she has in the future. The goal is to have the poor readers group in sixth and eighth grade reduced by 2% every year over the next 5 years. Another goal is to improve the better readers group in eighth grade by 4% in 2017. Table 4-2 shows the percentile of poor and better readers in sixth and eighth grade.

Table 4-2: the top table show the poor readers for sixth and eighth grade in 2008 and 2010 in Albertslund Municipality. The bottom table show the better readers for sixth and eighth grade in 2008 and 2010 in Albertslund. The left column in both tables is the average of the two years. Both tables have different texts for sixth and eighth grade (Albertslund kommune 2012).

Kommunenorm for usikre læsere (2008 - 2010)			
6. klasse	2008	2010	Snit
Ordlæsning 1	17,9	18,6	18,3
Ordlæsning 2	16,6	18,9	17,8
Gedden	40,9	37,7	39,3
Nedhjælp	20,2	19,2	19,7
Nybyggere	32,3	32,3	32,3
8. klasse			
Maries rejse	17,6	24,8	21,2
Om hobitterne	12	14,8	13,4
Førstehjælp	9,4	8,6	9

Kommunenorm for sikre læsere (2008 - 2010)			
6. klasse	2008	2010	Snit
Ordlæsning 1	50,2	50,2	50,2
Ordlæsning 2	31,8	36	33,9
Gedden	2,6	7,5	5,1
Nedhjælp	4,7	11,3	8
Nybyggere	17	14	15,5
8. klasse			
Maries rejse	21,2	21,3	21,3
Om hobitterne	41,4	44	42,7
Førstehjælp	48,7	52,1	50,4

The language and reading skill effects all other subjects, therefore, it is important to strengthen efforts in all subjects. All teachers have to focus on what the children read in their subject, to help give improve their language and reading.

This focus is also important for the municipality because numerous children do not speak Danish as their first language. This makes it even more important to focus on language and reading skills in these children. The municipality has to make sure that these children can read just as well as children who speak Danish as their first language (Albertslund kommune 2012).

The third theme is “community for all”. It is important that all children like going to school. Children learn more if they are a part of their class and the school in general. The general goal for this theme is to strengthen the relationship between children and between children and the teachers. It is important that nobody feels left out or are bullied.

The effort to reach this goal is to strengthen the bond between teacher and student. Each school has a student board, and for the last four years, they have met and learnt about democracy. This will continue every year and the municipality will create a student school board for all the students in the municipality, which will meet once or twice every school year. The goal for this theme is for all children to get at least 1 hour of exercise every day.

The last theme “full speed ahead for all” is about keeping the determination of children to learn. It is about challenging children no matter how good they are. The focus here is to get the amount of children that skip school down to no more than 6.5% by 2017.

This theme is connected to all the other themes. The efforts for those themes will also help this theme. Besides those goals, there are also other goals. The parents have to get more involved in their child’s education (Albertslund kommune 2012).

Besides these four big themes, two themes overlap with the other themes. The first one is evaluation, which states that evaluating the different themes and their goals is important to make sure that they are reached. The other theme is inclusion. It is important that all children learn, even the ones with difficulties. The goal is to get the help to the children instead of getting the children to the help. This means more children with difficulties should be a part of the normal school class (Albertslund kommune 2012).

The strategy matches the school reform very well, despite it being created before the school reform came out.

A way for the municipality to get the most out of the strategy is by using nudging. Nudging is a way to get the teacher to change the way they teach. Frameworks is one of the important tools.

The strategy shows that all the schools are lagging behind when it comes to the reading, math and science subjects in general. By framing the different themes in the strategy, the municipality can get the best of the themes and make sure that all the goals will be achieved before 2018. The first theme is, like describe before, about getting children to be better in natural sciences when they leave ninth grade. Natural sciences have always been something children love and hate. Here the teachers have

to be extra good at capturing the children that do not like natural science. There are many good goals in the strategy, but it will not be enough to educate more teachers, or to employ a new nature guide. Getting the teacher to teach science differently will maybe get the students more interested. One of the goals is to give teachers better education, especially in showing the teacher how they can teach outside, which they can apply to their classes.

When looking at reading, it can be difficult to see how the outside can be used. Books have to be used to help the student read, but many children in Albertslund don't have Danish as their first language. The municipality can use what Teacher 2 is doing, something she calls 'numbers lottery'. In this activity, children have to run outside to get the words, and then come back into the classroom where they talk about the words. This way, children that have trouble reading can get the interesting reading back.

“They need to be motivated by something, so last week I let them run outside and find words, then we talked about if the words have double consonant or not. Instead of just sitting inside looking at words, they could run out and write the words down.” (Appendix 2)

If the municipality would talk with the different teachers, like Teacher 2, then they can find out methods that work and do not work. This way they can make a good framework that can help teachers. When working with frameworks it is important to know that these structures can be both a good and a bad thing. If used in the wrong way, it can lead people to make the wrong choices.

Frameworks can also be used in another way, with the last two themes, which are about 'community for all' and 'all speed ahead', which ensures children like going to school and are motivated to learn. Here the school and the teachers can use framework, by making it more fun to go to school. For example, by going outside more. Some children have troubles sitting still and hence do not enjoy going to school, but if nature was used more, they could run around outside and learn in that way, making the goals about all children liking school easier to reach.

Availability is also important to look at, if a teacher has had a bad experience, he/she is more likely not to do it again. For example, if a teacher could not get the students to listen during a trip, then they will probably not take students on a trip again. If teachers are reminded about the times trips went well, then maybe they will reconsider using nature. Especially if they have options from new tools. These things together could give teachers a more positive view on using nature as a learning tool. If

the teachers are reminded about the time they did good, more goals could be reached in the strategy, which would help on getting the grade average of the class above the grade average of Denmark.

When talking about availability, it is important to look at the automatic systems. If the teacher just had a bad experience during trip, the feeling of something going wrong is very much on their mind. Teacher 4 gave an example Herstedlund School has iPads that they use on outdoor trips, which went missing the last she used them. Since this incidence, she will not use them again.

“It does not limit me using nature, but it does limit me using iPads again when leaving on a trip, I do not want to, have my name on something like that.”
(Appendix 4)

This is of course not an example on using nature, but it still an example how the automatic system is very much aware on the bad experience, which make Teacher 4 change her way of using the IPads.

Representativeness is about seeing patterns where there isn't any. If the municipality thinks they are seeing patterns where there isn't any, then they may make the wrong conclusions. That is why it is important to talk to the teacher, to interview them or convene a panel where they can be heard.

People use and see patterns without thinking about it, which is sometimes a bad thing. If teachers think they know the different kinds of children they have, they are more likely to think the same for the next child they see that act a little bit like the first child. For example, some boys have trouble sitting still and listen and if the teachers see another just acting a bit like the other boys then they think they are the same. This will make them reach differently toward those boys than they would toward other children. This can influence the last two goals in the strategy, 'Community for all' and 'Full speed ahead' for all.

These two themes are about making sure everybody likes going to school and that all students are challenged, which means both weak and strong students need be challenged at school. The teachers are used to teaching the same way they have been doing all these years. Their automatic system comes into play here. Here the municipality could go in and try to change how the teachers are preserving the children, and therefore the way they are teaching. This comes back to how the municipality can frame the strategy.

Wilkinson (2012) talks about how some can see nudging as being manipulative and take away people's freedom to choose for themselves, that it is essential to make sure people feel safe. It cannot be used blindly. It is important that the municipality has transparency and trust with the teachers, so

the teachers know what is going on and do not feel like they are being forced. He also writes that nudging, when used the right way, can make a difference. It could change the behaviour of the teacher, making it less stressful to use nature correctly and to get used to all the changes that are coming over the next year.

Overall, nudging is a good way to help change the way the teacher thinks about nature and if the municipality thought about using nature as a way to reach their goals, I believe it would give great results. It all comes down to how good the communication is and will be between the municipality and the teachers, without which nothing will happen.

4.2 Barriers

When talking about using nature more, it is significant to look at what the barriers are for the teachers. It is not enough to make sure the municipality comes up with goals they have to reach.

Anchoring is a good way to see where the teachers are coming from, since last year was a difficult year. With the lockout, many teachers felt as if nobody is listening to them anymore. They have a deal with the union that anything to do with school reform have to be done when the teachers came back in august. Teacher 1 talks about how nothing has been done for the new year.

*“The planning for the new year have been put aside, because we can’t begin before august and have something to do with our union.
(Appendix 1)*

While I did the interviews, I realized that there is a tension between the municipality and the teacher because of the lockout the year before. It is not all teachers that haven’t planned next year, Teacher 4 talk about different programs she have made for next year. She talks about the two different programs she wants to start with. The first one is about the weather and the other one is about rocks.

“We are going to learn about the weather, so we are going to go outside, but far away. The next program is about rocks and here me and my partner have to discuss if we think we can go, because we have to take our two classes, that is 54 student and we think it is too risky and the school says we can’t get another person with us.” (Appendix 4)

Teacher 4 have an anchor in using nature from when she took her education at the Tvind school, but even with this anchor she still have barriers in using nature. This is the first barrier that have to be overcome, and this is where the municipality comes in, then maybe the teachers would feel like somebody was listening to them and thereby make different choices.

Nature in childhood have three different modes of learning and three different ways of experiencing nature. To make sure children will get a good view on nature when they grow up, it is important to use all three ways of experiencing it, or else the children will not learn the three modes of learning. Right now, the teachers are mostly using vicarious experience. Teacher 4 talks about how it is important the students get their fingers in it as much as possible, she tries to take things back to the class if she can't get them out there, but at the same time, she will not take them out on trips if she does not feel safe.

“I will not go if I don't feel safe. I have to, I am the one stuck with if anything goes wrong.” (Appendix 4)

She is not the only one not feeling safe, and therefore sticking to vicarious experience. Teacher 2 also talks about not going anywhere if she doesn't feel safe. When she started teaching at Herstedvester School 8 years ago, she thought she would be using the forest a lot more than she has, but sometimes it is just easier to use the schoolyard.

“When I became a teacher here, I thought great Vestskoven is right there, I can spend all time there.” (Appendix 2)

Both Lene and Jannie talk about safety as one of the key factors for them to mostly using vicarious experience. All the teachers know it is important to get out in nature and all of them except Teacher 1 have some kind of experience with nature. Teacher 3 is passionate about getting the students outside, and she is the only teacher I interviewed that uses direct experience when she is teaching. She talks about how she sometimes decides to bring them outside. The whole class would go for a walk in the area looking at plants.

“Sometimes I think we need to get out and then we go for a walk in the neighbourhood, I am good with identifying plants. We look at the plants I am sure they will learn lots of.” (Appendix 3)

The last experience the children need are the one called indirect experience. Where the children experience nature in a more controlled manner. This is typically used when the teachers are going on a trip with the class. All the teachers say good things about this, as they like going on trips where the children are controlled in what they are doing. An example is Vikingelandsbyen once a year. Lene describes it well, the students can stay for the night, learn how to make food outside, chopping wood and so on.

“Then we have Vikingelandsbyen, where we also go, we use nature for cooking, slaughter a sheep and they can sleep out there for seven nights, no I mean one night, it is because it is seventh grade that spend the night. They get close to nature, sleeping in it, making their own food and learn how to take care of them self, learn how to chop wood. Well how they survive in nature, become a part of it.” (Appendix 4)

It is a good example of indirect experience with nature the children are controlled, but still learning a lot. The good thing about this place is there are structure and helpers, so the teacher don't have to look after all the student at the same time. All the quotes show how all the different experience are being used. It also show the unbalance there is in the use of the three different experience. If the teacher would use nature differently than the student would be more willing to be outside, and thereby learn easier. Especially some children that have trouble sitting down and being quiet, could benefit from running around outside.

If the teachers have trouble with coming up with what they should do and how much they should be doing the theory nature in childhood can give ideas. Teacher 1 talks about how she love being out in nature, but she don't have any education, she have thought about it.

“I can go out there that I don't mind, because I like it, but I don't have any education at all, it is very vague, not something I have done much about, I have done so much on other subjects, but not nature.” (Appendix 1)

Evaluative development describe three stages. The first stage is from around three to six years old, the stage for kids before they start in school, here it is important the kindergarten take the children out into nature. It could also be for the children in first to third grade. Here the first values are starting to develop the utilitarian, dominionistic and negativistic value.

The utilitarian value is about playing in nature and giving the child confidence. The dominionistic value is where the child will try to control the natural world and a willingness to take a risk. The last value for this stage is the negativistic one, the one fear and rejection of nature. At this stage, the children learn about the risk and dangers that can be in nature, helping them to know how to have control, give them self-confidence and teaching them about needs of other creatures. Teacher 1 is the only teacher I interviewed that work with first to third grade. As I wrote before she doesn't have any education in using nature, but at this stage, she does not need it. Teacher 1 know the important, she just done know how to use nature in the subjects she teach.

“Yes, men I have a hard time seeing how I can use it [nature] in the subjects I teach in. of course I could always do something like getting them to collect words outside, maybe putting some words on trees or out in nature, but something ”
(Appendix 1)

The barrier here is that Jette does not believe she have the right knowledge to use nature. She does not have a natural science education and therefore believe she don't know how to use nature.

The second stage is from around age six to twelve. This stage is for pre-school children and middle school children. If the teachers learned about the three stages, they would know what they should be focusing on. The second stage is where the children develop humanistic, symbolic, aesthetic and the knowledge component of scientific value.

Humanistic value is about an emotional bond with nature, the symbolic value is about improving communication and thought, aesthetic is about children capacity to recognizing order and the last value is knowledge part of the scientific value. It is about learning about nature in a systematic way. As I describe before this stage as where the children get more familiar with nature. This means that the small trips that Teacher 3 takes with her class, where they go out around the area, she using the direct experience from the theory, but it should be the teachers that teaches middle school children that should be out walking with their class. This walks will help the children evolve the different values at the right time. Especially for children today it is important to evolve the values at the right time, because their family's don't take out in to nature, the play football or have other hobbies outside, but they don't go outside and see nature with their parents, which is what Teacher 2 is talking about:

“Over the years here in Albertslund I have needed to change my view on how nature are used, because it is right new door, so I would have thought at the parents would take their children out more than really do.” (Appendix 2)

The barrier here is age of the children, they are an age where they get more independent and it can be difficult for the teacher to control them. This is why the teacher don't take them out as much as they want to. As written earlier they will take on trips if they don't feel safe.

The last stage is from around 13 to 17 years old. This stage is for the oldest student, seventh to ninth grade. Here the child will develop the moralistic, naturalistic and the ecological component of the scientific value.



Picture 4-1: A male European robin (*Erithacus rubecula*), a bird that can be seen in Danish nature, the picture is from a garden in Albertslund (Private photo).

The moralistic is the ethical value, this were the child learn about having respect and kindness for the natural world, the naturalistic value is the value were the child start expressing desire for close contact with nature, the last one is the ecological component of the scientific value, this is one is learning about ecology. This is where the children start to understand the bigger picture, larger spatial and temporal scales, like ecosystems, landscapes and evolutionary processes. Teacher 3 is the only teacher that I interviewed that teaches seventh to ninth grade. She know a lot on biology and the other natural science subjects, and she is very passionate about it. She is good example using all the different experience, but the thing she is doing is what the teachers for middle school should be doing. When teaching the oldest student the focus should be on the bigger picture. She should still take the students on trips around the area, but she should be focusing how everything is connected.

In the analysis multiple barriers have come up, the first is contact between the municipality and the teachers, they don't feel like they are being listen to. The next barriers is on safety, the teachers mostly uses the vicarious experience because they don't feel secure when having the class with outside. Another barrier is education, some of the teacher don't feel they have the prober education to be using nature, they don't how to use it if they don't have a natural science education. Another barrier is the

children age, working with middle school children can be difficult if they are not use to learning outside.

4.3 Possibilities

Possibilities is important to look at when talking about using nature as a learning tool. Orr's (2002) argument on how children haven changed today show how important it is for the teachers to use the possibilities that are there. Children need to be motivated to use the nature and it have to start at an early age or else they never get feelings for it. Chawla (2002) write about how adults have emotional memories of their experience with nature. Children today do not have the same emotional connection with nature anymore. If they were to spend more time outside then they would also get these emotional memories and maybe even get a need to protect it. The schools could be a link to nature for the children. Fredens (2008) write about finding a balance between being inside and being outside, Malene Bendix have been working on this for 15 years. She have helped develop the idea of using outdoor school in Denmark, for a long time they were just working with an idea as a grassroots organisation, but now with the school reform now something have come from up-bow to, but she does know that they are no were done yet, that are still a lot more to do.

“We are no were near done yet, but the didactics will now be worked on a lot more. In the beginning it was enthusiasts that started it and now it is a broader group of teachers that will be forced not just to think classroom when they are planning next year, they also have to think of the outdoor space.” (Appendix 5)

Chawla (2002) talks about how greener schoolyards can give a less aggression play and more imaginative. This can help on what Fredens (2008) are saying with the two bodies. Children need to use both of them and Malene Bendix see a good opportunity in the school reform to change the way teachers think and plan, so the children in the future will use both of them more. The teacher that are using nature right now have to be very independent and confidence. Both Henrik Jørgensen and Malene Bendix talk about the independence the teachers need to have. Henrik Jørgensen talks about how he can't be a nature guide for all the school classes that comes out to the school, which is why the teachers using Herstedhøje nature centre have to be independent.

*“It is teachers that are confidence enough to use nature when they are teaching.”
(Appendix 6)*

The teachers I talk to are more use to the more traditional nature school where the nature guide have made a program for the day and is responsible for what the children learn that throughout the day.

Where the teacher is there to keep order so the nature guide can focus on teaching the children. The teachers does not have to go to the nature school to use nature. They could use the schoolyard, which some of the teachers also talk about they do in some way. Malene Bendix talks about how it is easier for the school in the countryside to use nature, because they do not have to go far, where the schools in the city have difficulties, but she say at the same time it is all about using what they have.

“you can say that in the countryside you have good possibilities to get out into nature, but in the city you can use the possibilities that you have, like parks, but also all the cultural institutions.” (Appendix 5)

Jannie had to change her view how nature was used in Albertslund, she thought that children was spending time in nature with their parents, because there is so much of it in the municipality, but as Orr (2002) write time have changed, children do not get out as much as they did a couple of decades ago. This is why it is even more important to use it in school, especially now where the children have to spend most of the day in school. Teacher 2 started out with the idea that she would use nature more teaching in Albertslund, but had to realize she does not get out there as much as she want to.

“When I became a teacher here I thought great Vestsø is right nearby, I will spend all the time out there. I haven´t not done it as much as I wanted to, because when do you do it and how is it out there.” (Appendix 2)

There are many benefits of being outside and there are possibility for the teachers to get help to start using nature. One of them is a webpage. Most of the teachers know Malene Bendix webpage, skoven-i-skolen.dk, but most of them don´t use it. The webpage show different ways the teachers can use nature. It is made so it should be easy for teachers to find their way around and give them many good ideas. Malene Bendix have spent many years building up a network, that can help teachers get started, but she do not have to promote it, the teachers have to come to her. Right now, there is five outdoor schools in Denmark, but hopefully there will come more. These outdoor schools could also help with education for the teachers. Malene Bendix is the only person working on the website, so she do not have the time to be out promoting it. She use the media when she can.

“We are using the media whenever we can, but we do not contact every school that is not possible, but we are using the media as good as we can so we can get through. We are sending out a newsletter every fourteen days with ideas about what to do. So that is what to do.” (Appendix 5)

The study made in Sweden is a good example on how in just a year small changes can make a big difference. As Orr (2002) write about children spend a lot more time in front of the screen today,

getting more disconnected with nature, but as the Sweden, example show it does not takes much to change this. Orr (2002) write about children being shaped to find materialism, economic growth and human domination in nature more important than anything else, giving children the idea that nature is there to provide for their need, not anything else. This makes it less important to them to protect nature. By making the same changes in Denmark as they did in Sweden could help with the connection. Here the webpage again have many good ideas for the teachers and Malene Bendix have the network.

Verbeek and Wall (2002) write about the natural connection children have to the natural world when they are small, it is important to nurture this connection as much as possible when they are small. This could be by starting early, starting from first grade where there are more time for playing and exploring nature, getting the children use to learning outside, so when they get to middle school, it is easier for the teachers to take the children outside. When getting to the oldest classes they are used to being outside making it simple for the teachers to keep using it, building on what they learn before. Then we can avoid what Orr (2002) are talking about. Henrik talks about how mostly children from first to sixth that are using the nature school.

“It is mostly primary schools and third, fourth and fifth grade, yes it is primary and middle schools.” (Appendix 6)

The possibility for using the nature school is for all grades, but seventh, eighth and ninth grade does not use it as much as the other grades. The reason for this is that the curriculum in these grades are bigger and there are preparation for starting in high school or another education. It is difficult to make sure the teachers get through the entire curriculum in time. It is also difficult to give grades to the students if the learning tools is not traditional. One of the things that could be done is to make courses to benefit the teachers so they have all the tools they need.

Hansen (2004) talks about how children have two different bodies, a school one and a playing one. This means that the recess is just as important as spending the classes outside. Recess helps on children development, because they can develop their imagination and learn how to interact with other children. This fit what Fredens (2006) are talking how it is important to be outside. He talks about a good learning experiences, where learning something outside will be a stronger experience than sitting inside listening to a teachers. Making courses for the teachers so they learn how to use nature can develop both the bodies that Hansen (2004) is talking about.

4.4 Solutions

When looking at solutions it is important to take the barriers and possibilities into account. The importance here is to see what need to be done so the teachers overcome their barriers and uses the possibilities that are already there.

The first and most important barrier is the one on safety. As written earlier the teachers don't feel safe if they not more than two teacher or three if there to take two classes. Bendix and Barfod (2012) have made a booklet where they write about how to integrate nature in teaching. One of the thing they write about is it is important to be two, which the teachers also talks about. Teacher 2 talks about she would never go on trips with a class unless there are another teacher with her. She finds it difficult and if anything happens she have to be able to go with the child, but at the same time not leave the rest of the class behind.

“We are always two when we go on trips, I would not go alone with a class. Then it would have to be a short trip on bikes or walking. It is because and what makes it difficult sometimes, if somebody falls over on their bike on the road and I have to take the child to the hospital.” (Appendix 2)

Bendix and Barfod (2012) have different ideas the use of nature. There are four, desire, responsibility, get the parents sworn in and be two. Two of them the teacher are already aware of them, be two and responsibility. The last two are get the parents sworn in and desire. This is another barrier. I described earlier some of the teachers don't have the knowledge on how to use nature, but they have the desire. That is why courses would be good, but the teachers do not use it, Henrik Jørgensen talks about how they have tried to make courses for the teachers but there are no demand for them.

“Yes we do courses we can do, but there is no demand from the teachers. It is not that we do not want make all the courses the teachers need to start using the nature school and still have relevance for their subjects, but it is not in demand.” (Appendix 6)

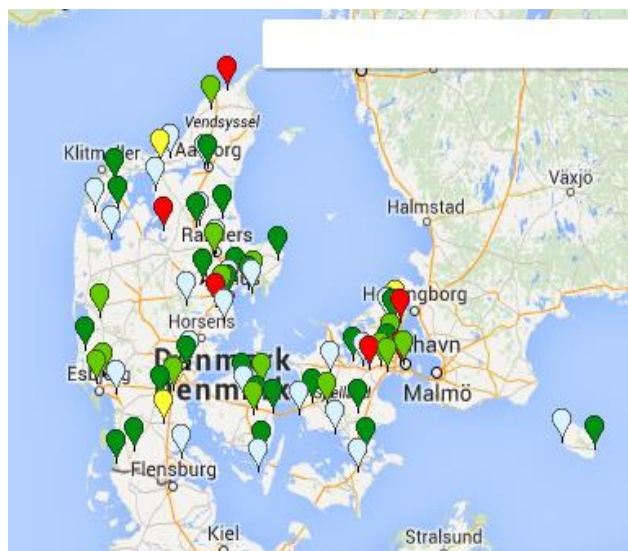
The courses could help get the teachers started so they would get more confident along the way. If the teacher to the parent to help get them involved in the changes then maybe the children would embrace the new way of teaching, making it easier for the teachers to also overcome the barriers and use nature more. Using nature does not have to mean leaving the school area. Coyle (2009) write about how the teacher do not have to go fare away from the school, if the schoolyards was changes and made greener then the teachers could start there. Many of the schoolyards today is mostly paved, but is better for the children and the environment if the schoolyards was grass and other plants. Then

the whole issue with safety would be overcome, because the teachers do not have to go away from the school and then travel time would be zero, giving the teachers more time outside. Chawla (2002) write about how children become less aggressive if they have the possibility to play outside.

Starting out with using the schoolyard would be simple and easy, the children could even help with designing the new schoolyard, this could be the beginning to get them interested in being outside trying something different. Teacher 4 talks about how they at her school have talked about making school gardens where they could close to nature.

“We have talked about that we should have school gardens, there are some people that are talking they had it at Hyldager School, It is an opportunity, for you will get closer nature.” (Appendix 4)

When it comes to education, Teacher 4 have a good point. She talks about how even though they are teachers they cannot know all there is to see outside, they do not have the time to go around and find what is interesting for the children, the nature guide have the time for this. This is why she liked using the old nature school more than the new one. Malene Bendix have made a map that show different place where there are people with different knowledge that teachers can use when there are going on trips. This map is made so the teachers can put different things on the map, maybe there have been somewhere where they have knowledge and this way there can share with other teachers. Right now as seen below in picture 4-1, there is nothing from the teachers, but in the future hopefully some teachers will start putting thing on the map, giving other teachers ideas on what to do.



Picture 4-2: this picture show the different possibility there is in Denmark right now, the red dot is outdoor school, the light green dot is nature school, the dark green dot is hunters, the yellow dot is beekeepers and the blue dot is equipment (<http://www.skoven-i-skolen.dk/content/kort>).

Malene Bendix have made it so teachers from all over country can help each other, when the things from the teachers start getting on the map.

“It can be used both locally at the school where the different teachers put out material they can find in the local area, by the statue or the bog old tree or by the harbor, we have done that and that. And then by using the map you can search on subject, grade, place and time of the year, but the neighboring schools would also be able to use the map and see the material or they would be able to go in and search on the coast in general. So both my neighboring schools can see it, but I can go in and search in the coast so I can get all there is on the 7000 km coast we have in Denmark, so there is many inputs on the map and by sharing the material.” (Appendix 5)

Anybody can put something on the map, so like Pyle (2002) are talking about, if somebody have a great memory of somewhere special, where they know more than others. They are also allowed to put their spots on the map, which way help the teachers. Pyle (2002) talks about how even a vacant lot can be a good spot for making memories. As a good example is Vikingelandsbyen. It is used a lot by the teachers in Albertslund, but the knowledge they have it could help teachers somewhere else, where they do not have something similar. Putting the special places on the map could help keeping the special places a lot longer. It is important to help the teachers see the potential in the knowledge they already have. Pyle (2002) talks about how some parents can be overprotective of their children, but giving them free space when they are playing helps their development, so instead of holding them back, it could be an idea to show them some of these special places, and give them the sense that there are a need to protect this.

Courses could also be a solution to the educational barrier. The nature school could make different courses that, Henrik Jørgensen even talks about they want to make these courses. The courses need to make sure the children will get a learning experience, like the one Fredens (2006) is talking about, how there have to be an connection between using outside and inside. These courses could help with making this connection. Henrik Jørgensen talk about how they would prioritize the course if the teachers want them and he would make so they would be about how to connect nature with the different subjects.

*“Yes I would be something we would prioritize that is for sure. And I have made different lessons for teachers on how they use math and geography, all kind of different subjects in the forest that do not have to be science or biology.”
(Appendix 6)*

Making these courses so the teachers would know how to use nature more, could insure that all children would get the most out of their school days. That is important now more than ever. Coyle (2009) agree that children get overstimulated when spending too much time in front of the screen. The different side effects, like shorter attention spans, increased aggressive behaviour, higher change of stress and depression and isolation is all effects that can disturb the other children in the classroom. By using nature children would naturally start slowing down over a longer term. They spend their energy outside playing and running around. Then when sitting inside another day, they would not disturb as much as if they have not spend the time outside. This could also help on other problems, bullying could also be less of a problem, because playing outside in green areas helps develop children and make them less aggressive, which would also make them easier to take on trips, because they would do what the teacher says.

The booklet made by Bendix and Barfod (2012) is a good for the teachers that like to know more about using the outside. The booklet together with a course from the nature should be enough to get the teachers outside, but it is not, because it all comes back to the municipality.

Table 4-3 show the different possibility have written about below it. The table is an overview the different solution that can be started now. It would not be difficult to start making these changed, Henrik Jørgensen that running the nature school in Albertslund, are willing to make courses for the teachers if they want them. The biggest changed would be the schoolyard, this would take longer, but would be a good beginning because it would easy for the teacher to spend outside without leaving the safety of the school. Some of the solution are already started, the booklet is already made and the map is available on the webpage, here the challenge is to get the teachers to start using it.

Table 4-3: This table show the different solutions written about the chapter.

Solution	Explanation	Provider
An extra teacher	Making it possible for getting an extra teacher to go on trips.	The municipality + the schools
Course, 1. – 3. Grade	What is everything called, what can you use it for, making thing out of things in nature.	The nature school
Course, 4. – 6. Grade	Learning about the basic, for example on how trees need water to grow and so on.	The nature school
Course, 7. – 9. Grade	Learning about ethics and ecology, how to give children the big overview of how everything is connected.	The nature school
Schoolyard	Making the schoolyard greener with plants, bushes and trees, giving the children a chance to play on grass.	The municipality
Map at skoven-i-skolen.dk	The teachers put the things they know on the map on the webpage, helping each other with ideas.	The teachers
Booklet	Make the booklet available to teachers so they can use the knowledge that is already collected.	Malene Bendix

These solutions are mostly simple in easy to implement, but if the municipalities, schools and teachers do not work together nothing will ever happen. This is why I come back to nudging, the municipality could look at where they want to go, and get help to come up with small nudges to get the teachers in the direction they want them to go. This could be getting them to use nature more, but it could also be other ways. When looking at the solutions they would help on many of the different goals there is in the strategy, so it would benefit the municipality to start using these changes and start promoting to the teachers to use nature. The children would get better science lessons, more children would like to be at school and more children would get personal challenged every day in school. Of course, this does not mean that the children have to get all their classes outside from now on, this is not possible, but spending a day a week outside could be a goal for a class. This also mean the teachers have to able to work well together.

Looking at the four different ways children can learn seeing, listening, toughing and doing. The way most teaching is done today is by listening to a teacher and then make exercises. This only benefits children that learn by seeing and listening, which means that half the children are not learning the best way. By using the outside children that learns by toughing and doing well benefit from being

able to use nature around them. being outside the teacher could start out with talking about the exercise, then giving them a paper where it say what to do and then let the children solve the exercise in their own way with what they have around them. This way the children that like to seeing may what to sit somewhere and write down the answer, where the children that learn by listening could sit together and discuss what the answer. Children that learn by toughing would maybe draw the answer or make a picture with things that are in nature and the last child that learn by doing need to move around the area building the answer. Therefore, by being outside children that learn in different ways would be able to learn in their own when without disturbing the other children.

5. Discussion

The strategy and the school reform can become something great for the children in the future, with the changes that have to be made, that is a possibility for making more fun to go to school. It is important thought to connect with the teachers and get them to see the change as a good thing. When looking at strategy there are good possibilities for the teacher for using nature more than they are doing right now. Problem is they have different barriers, so they don't use the possibilities as good as they could. The school reform work well with the strategy. The goals in the strategy could be reach and at the same time, the teachers could use nature more than they are doing now. If the municipality spend time on doing some research about what barriers the teacher have, and what is stopping them from using nature, they could set up a good frame. By using framing, the municipality could get the most out of their teacher and at the same time, the teacher could feel they are being listen too. That are one of the barriers right now, and if this is not overcome, there will be little change and not all goals will be reached. It will take time to make the research, but overall the time would be well spend, because they would get it back. It is always important when using nudging to take into account that in can feel manipulation, the line between these two are thin, and they are connected.

It is important for the municipality to reach their goals in the strategy and the interviews show the teachers have many frustrations toward the changes that have to be made, which is not good. This have to change if the municipality want to do better. Some of this could change with the new nature guide at the nature school, this person have make a good connection with the teachers, and come up with ideas about how to use get the teacher to nature more. Everything here is about communication, the municipality have to communicate with the teachers or else the change will never be accepted.

They have to start working together instead of against each other. That is why it is important for the municipality to improve communication and have transparency. This way the teachers will feel they are being listened to and will be more open to making changes. It could help on the barriers the teachers have to using nature, by listening and providing the help the teachers need. If the municipality do not make changes on their own then the teachers would never get the motivation to using nature. They have different barriers, and the most significant barriers comes from bad communication between both parties. If communication was better the working environment would also be better, and the children would benefit from it. Which is one of the goals in the strategy, but all the teachers keeps coming back to two barriers, beside communication. They are safety and education. These barriers cannot be overcome without the municipality's help.

The teachers are not using the nature so much right now. Some of them do not know how they can use it in their subjects. It is not because they don't want to they just don't know how to. When talking to the teachers I found that the two that are teaching natural science use it more than the two other teachers do, but they all have barriers. My analysis show four different barriers, the most important one is the one on safety and the one all the teachers talk about. Right now, there is no money or time for schools to get an extra teacher with on trips. This is a problem. The teachers need to feel secure, this could be done with looking at where they are coming from, their anchor. Most of the teachers I interviewed have some kind of connection with nature, the two that teaches in natural science of course have their education, but also Teacher 2 one of the other teachers she was a scout when she was a little girl. Even so, they do not use nature as much as they want to. When they ask for an extra teacher the answer is no. My guess is here that it comes back to money. The teacher know they have a big responsibility for the children when they leave the school area. Here they need an extra teacher. If this is not possible, then changing the way the schoolyards looks could also be a solution, getting children and teachers to work together on making the schoolyard greener, so the teachers did not have to leave the school area. This a bigger change than the other solutions, but it would have a long-term effect. It could change the way the schoolyard are used today making it a place children could play and at the same time learn. This will not give a better communication between the nature school and the teachers but it will give the teachers ideas to what to do outside. Which is a good beginning, it could evolve into getting more teachers to use the nature school long term.

Another barrier the teachers are talking about is education, not all of them believe they know enough to use nature the best way possible, it is not because they do not want to, but they just do not know

how. Here solutions could be to make the course for them, to teach what they could do. The important with these courses is they have to fit with the age of the children. The theory in children in nature could help with this. At have three stages for the children. The stages could be used for primary, middle and the oldest classes. Basing the courses on the different values the children are developing then the teachers could learn what to focus on. The courses would be held by the nature school, because Henrik Jørgensen already are talking making courses for the teachers and are willing to prioritize it. Therefore, a solution have to be found on how to get the teacher to take these courses. The municipality could help with this, because it would benefit the goals the municipality have and give a better environment at the school, because some of the children need the change in environment so they can learn better.

One barrier talked about by one of the teachers is how important it is that the children listen. It is again about a safety, she does not take a class on a trip if she does not believe they would not listen to her. If the children early learned to use nature, they would listen to the teacher more when going on trips. She will not take the children that do not listen to her on trips again, which make sense, but also makes it difficult to go on trips if she have to leave children at the school. It comes back to again having an extra teacher with her on trips that can help keep them quiet.

With these barriers, it is important to come up with good solutions, which are simple and easy to implement. It is important to see that the solutions to change the way teacher uses nature do not have to be big changes in the way teachers teach today. Most of the solutions could be set in motion already today. The courses, the map and the booklet are easy and simple to start getting out to teachers to help get started. All these solutions have already been thought of by the people working on them and are simple to implement, but right now with all changes happening with the school reform the effect of them would not be seen right now. However, the teachers have so much to think about and new rules to learn that thinking about using nature will not be a priority. It means that nothing will change even if the teacher would like to spend more time in nature, because of the stress they have right now with the public school reform, they are trying to coop with the changes they have to make they do not have the energy to learn something new or change their behaviour.

The change in the schoolyard and the extra teachers is up to the municipality, but this is what is stopping the teachers. Therefore, if the teachers should use nature, there have to be a change from the municipality. This is not easy, the municipality have also been forced to make changes, but if the teachers and the municipality can find common ground, better solutions can be found.

The different solution could help children that have difficulty sitting still in class. Using nature could benefit the children because the different ways of learning could all be used outside on combination with the other benefits children will get out of being outside. There is of course also children that would not benefit from being outside, which is why it have to be combination of the two. Some days outside and some days inside. This should become easier now where the different grade have more hours during the day, but of course the teacher also have the desire to use nature.

Looking at the different barriers it becomes clear that it will take more that communication to help the teachers overcome their barriers. The different solutions could help with overcoming these barriers, but it have to be helped. The municipality and the nature school are taking steps to help this, by making the new position for a new nature guide to focus on the teachers and to make the communication better between the parties, the barriers can be overcome and in the end benefit the children that need it.

6. Conclusion

There are many benefits about using nature when teaching children, but then the questions is why the teachers are not using it more. The answer to this question is that the teachers have barriers. The barriers are safety, communication between municipality and the teachers, education and the age of the children. If anything can be changed, the municipality have to start it. The strategy is a good beginning if it is used the right way. The municipality can use nudging to reach the goals of the strategy, making the right frame and having transparency they can work with the teachers to make the right choices. There are many good possibilities for the teacher already. There are nature schools and the webpage, skoven-i-skolen.dk. The problem is that even though they have good intentions, they are not getting used to the full potential.

That is why coming up with good solutions that can improve the use of nature. These changes have to be made by the municipality to begin with, because to get the teachers outside more, they need to feel secure, this could be done having an extra teacher on the trips when leaving the school area. It could also be by changing the schoolyard so it became greener, having a lot more natural elements, like grass, bushes and trees. The teachers are willing to make changes, so by making giving them the safety to use nature as they believe is best, could start a beginning where the communication would improve between all parties.

Education is another barrier, this can be solved by courses made by the nature center, this can only work for the communication between the nature center and the teachers are better than it is right now. Courses have been made for the teachers before, but the teachers have not use the possibility even though they are talking about they do not know what to do. The nature center have a new nature guide and this person can be the solutions to the problem, the task of this person is to make the communication between the nature school and the public school better. This could help when the nature school do courses for the teachers on how to use nature. Education could also be about how children learn, by using the outside the different ways of learning would be easier to use outside, there are more space for the children to learn in their own way.

Looking at the problem overall it is easy to see the without communication, nothing will happen. The new nature guide have a big job ahead of them if any changes can be made, which may not happen anytime soon because of the new public school reform. So it seem like there are some simple solutions to a simple problem, but with everything else going on right now, so for the teachers to focus how to use nature more would be too much for them. Therefore, unless the municipality makes it a priority nothing will happen anytime soon.

7. Perspective

From my small study, it is easy to see much more can be done in this area. Almost none of the theory I have use and the example I have is from Denmark. Every country is unique, so to get the best result, research have to done in Denmark, especially after the school reform. A survey could be made, where a lot of teacher is asked on how they use nature as a learning tool right now, and what they think need to change for them to use it. My interviews with four teachers is difficult to use, because four teacher can't give an overall view on how thing are done right now. It could be interesting to make a bigger survey of all the teachers in the municipality to see how they are doing things right now. Therefore, what the focus for the strategy should be, maybe better goals can be made, ending up with better results. Another thing that could change the analysis is my interviews was made before the school reform came into to play. The teacher I interviewed can have changed their mind if I asked them the same questions today. It is never easy when changes are forced on people, they will fight to go back to status quo. With all the changes forced on the teacher the last year, with the lockout and the school reform, it is easy to see why they are finding it hard to cope.

From the many different studies done in the subject, it shows how important it is to have nature as a part of the learning experience, but it is also clear that the teachers' don't feel ready to teach in nature. They need more confidence to teach outside the classroom. Therefore, it would maybe be a possibility to have a course about using nature in learning, when students study to be a teacher. This way the new teacher will have the confidence to use the outside space more, and maybe they can show the other teachers what they could do. This is the long-term perspective for the teachers, but it would be a good way to give the teachers the knowledge they need to use nature.

If resources are put in getting children into nature, to get the teachers to use it in their teaching, then it could help on the way children think about nature overall. We need to change the way we think about resources from nature. We have to really start looking how we can protect nature and thereby our planet in the future. We need to get better and it starts without children, if we can give them a good foundation on how everything is connected then they would be able to make better choices in the future and for the future. Call it nudging with a very long perspective. By changing the view the children have, by giving them a good set of values. We can make sure the nature in Denmark will be protected in the future. We could even go as far as talk about climate changes. If the children have a good connection with nature, then they would make choices that would protect it, some of this would also affect the climate changes. They would see how climate change affects nature and would maybe take steps to change how they use resources, like oil and coal. This is of course a big connection to make, but we have to start in the small to get a big effect in the end.

I believe that for any of the most of the children in public school, I believe most of the changes the school reform makes is good, but there are also things in the school reform that can set the teachers back. By using nature more and removing some of the things that stress the teachers, like they have to be at the school during the workday. Then we would get a better public school, which would produce children that are happier and know more than they do today. In the end it is all about getting the government and the municipality to listen to the teachers, to communicate so we not end up with new changes that have to be forced on the teachers, it will end up with teachers saying stop when long before they want to. So doing more research, finding out what works the teachers would be able to do more and the municipality would be able to reach their goals.

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