

Environmental Education and Nature Schools in Denmark

A study of the role of nature schools in environmental education and environmental awareness rising among schoolchildren.



Supervised by:

Vlada Fuks

*Associate Professor
PhD student*

**Jesper Holm
Pernille Almlund**

**International Master Degree Course in Environmental Policy
Department of Environment, Technology, and Social Studies
Roskilde University, Denmark
May, 2004**

ACKNOWLEDGEMENTS

I would like to thank my supervisors Associate Professor Jesper Holm and PhD student Pernille Almlund for guidance, patience and inspiration.

I would like to express gratitude to nature interpreters Tina Mono, Uffe Bruun, Per Mikkelsen, Jacob Jensen, Jes Aagard, Dorrit Hansen, Karen Vesterager, Rikke Mortensen, Johnny Krog, Signe Dinsen and Annegrete Munksgaard for their interviews, and for their guiding support, encouragement and interest in my research.

I owe special gratitude to teachers Anni Blom, Mia Liv, and Mette Brandt from Nærum School, Michael Hansen and Helen Bjorn from Skottegårds School, Kim Olsen and Lene Eriksen from Birkelunds School, Peter Søndergaard and Marion Nielsen from Pilegårds School, Elin Landerslev from Baunebjerg School, and Inga Friis from Enghave School for being very open to cooperate in this research and for their precious interviews.

I would like to thank Arne-Bondo Andersen from the Danish Nature and Forest Agency for his interview, and for his encouragement and guidance.

I would like to thank Professor Peder Agger for his interesting interview.

*Dedicated to My Mother
with Love*

ABSTRACT

Environmental education is considered one of the most important long-term solutions to the environmental crisis. Informal or alternative approaches in environmental education become ever more important in motivating attitudinal change. The research subject of this project is nature interpretation for children in Denmark. We investigate how this institutionalized educational activity is integrated into the general education of children, and what is its role in environmental awareness rising among schoolchildren. We focus on possibilities and difficulties to improve cooperation between public and nature schools for better environmental education. On the basis of our empirical observations of nature school sessions, interviews with schoolteachers, and interviews with nature interpreters an attempt is made to answer the research problem, and final statement of the research with a few recommendations included is presented.

Keywords: *environmental education, environmental awareness, environmental consciousness, nature interpretation, nature school, 'hands-on' method, experiential learning, tacit knowing, action competence*

GLOSSARY

<i>Deep ecology:</i>	A form of environmentalism that advocates radical measures to protect the natural environment regardless of their effect on the welfare of people.
<i>Ecology:</i>	The science of the relationships between organisms and their environments.
<i>Empathy :</i>	Identification with and understanding of another's situation, feelings, and motives.
<i>Epistemology:</i>	The branch of philosophy that studies the nature of knowledge, its presuppositions and foundations, and its extent and validity.
<i>Phenomenology:</i>	A philosophy or method of inquiry based on the premise that reality consists of objects and events as they are perceived or understood in human consciousness and not of anything independent of human consciousness.
<i>Phenomenological:</i>	physical, real, sensible, sensual, substantial, tangible, true, worldly
<i>Tacit:</i>	implicit, silent, understood, unspoken, known.
<i>Tactile :</i> <i>tactile</i>	Of, relating to, or proceeding from the sense of touch; tactual: <i>a reflex.</i>
<i>Reference:</i>	http://dictionary.reference.com

ABBREVIATIONS

AC	Action Competence approach
DN	the Danish Society for Nature Conservation (Dansk Naturfredningsforening)
EE	environmental education
FRL	the Danish Outdoor Council
IUCN	the World Conservation Union
MEM	the Danish Ministry of Environment
NGO	nongovernmental organization
NI	nature interpretation (naturvejledning)
SNS	the Forest and Nature Agency of the Danish Ministry of Environment (Skov- og Naturstyrelsen)
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WSSD	World Summit on Sustainable Development

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Chapter 1. Introduction

This project takes its departure in an intention to explore origins, development, and mechanism of nature interpretation in Denmark - local activities, aiming at raising general public awareness and knowledge about the local nature.

I found my personal motivation to do a project about NI and nature school in the 'childhood I come from'. I spent my early years in a house with garden in a beautiful area with forest, fields and a beach. Reflecting on this time, I realize I was a child of nature. Not a single day went by without a swim in the sea, or a play in the fields with my fellow neighbours, or skiing trip with my father and a dog. My family, and me we also spent a lot of time in our garden, and on top of everything, we had a great number of pets. My life was filled with nature, and it was my best friend. Already then I realized how much it meant to me. I knew I had emotional connection with "my" sea, and I was afraid that at a point in my life I might have to live away from it. My childhood and my origins will always mean to me, after my family, that forest and that sea I used to be with everyday, as well as my beloved cats, dogs and crows. They made my childhood very special and rich. Since we moved out of that house and that area, it seemed that I moved away from what made my life so meaningful, it seemed that I got detached from myself. I was never able to find the same peace and happiness again. It is my Mother and my childhood that I dedicate this paper to.

Environmental Crisis

Environmental pollution and misuse of exhaustible natural resources that has been taking place at increasing rate ever since the industrial revolution poses a threat to well-being of the planet and humankind. Many landscapes all over the globe have been irreversibly changed by industrial and agricultural activities, as well as by wars. Man is claimed to play a role even in such cosmic phenomenon as climate change, a fact that is hard to grasp and accept. We are transforming our environment without knowing it, and even now that international community has come to realize the impact of Man on the planet's life, we still can not be sure about its magnitude and consequences. One can compare Man on Earth to a driver without driving license and knowledge of the route. We confidently use whatever we can get from the nature, but we can hardly see further than to the mere fact of resource depletion or pollution.

Realization of the fact that use of natural resources leads to their depletion and possibly pollution is a good start, but it does not tell us precisely how it might effect an ecosystem, what consequences can it bring, can they be reversed, etc.

All these questions need to be addressed and answered, and not just by the scientific community. The knowledge about our natural environment, and its interrelation with Man is to be disseminated among all people in order for the major changes in attitudes to begin. Then can we talk about saving the environment – when every human being is aware of the concepts of pollution and depletion, and when every human being takes responsibility for his or her actions towards the environment.

Significance of Environmental Education In Solving The Crisis

The United Nations Environmental Program (UNEP) has emphasized importance of dissemination of environmental consciousness through education in the fight with challenges of the new millennium: "Most importantly, we must educate individual citizens about the environment. Environmental education efforts must dramatically increase our collective understanding of the dynamic, essential and mutually supporting interrelationship that characterize the natural world, including our own role in that world. Only through education can we hope to alter fundamentally widespread patterns of environmental abuse. Clearly, the health of the environment depends on the degree to which individual citizens participate in the decisions that rule their lives."¹

A few facts brought below demonstrate that United Nations give a high priority to raising environmental awareness.

Youth Advisory Council (YAC) under the United Nations Environmental Program (UNEP) has been established with the purpose of promoting participation of youth in environmental protection. It has its own web, which serves as forum for the participating youth. Its aim is to engage young people in the work of UNEP.

New Global Virtual University under the United Nations (UN) has been founded in 2002, immediately after the World Summit on Sustainable Development (WSSD) in Johannesburg, to promote environmental and development education among students and academics, with the focus on the developing countries.

¹Dr Klaus Toepfer, Executive Director, United Nations Environment Programme
http://www.unepapac.org/message_annan.html, retrieved on 14-12-03

Agenda 21, the key document of the Johannesburg Summit has a separate chapter on education and public awareness (Chapter 36). In this chapter Agenda 21 brings forward the importance of education for the environment, and awareness raising:

Education, including formal education, public awareness and training should be recognized as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues.

Both formal and non-formal education is indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making. To be effective, environment and development education should deal with the dynamics of both the physical/biological and socio-economic environment and human (which may include spiritual) development, should be integrated in all disciplines, and should employ formal and non-formal methods and effective means of communication.[...]

*There is a need to increase public sensitivity to environment and development problems and involvement in their solutions and foster a sense of personal environmental responsibility and greater motivation and commitment towards sustainable development.[...]The objective is to promote broad public awareness as an essential part of a global education effort to strengthen attitudes, values and actions which are compatible with sustainable development.*²

Concept of Environmental Education And Latest Research Trends

Environmental education (EE) is a relatively new concept, which has been on the major political agenda since 1970s.

Protection and preservation of our natural environment is the task that lies on the shoulders of the growing up generation, and therefore the major target group of the environmental education worldwide is the youngest generation.

The concept of EE and its importance has been widely recognized and debated for the last 3 decades after a landmark IUCN/UNESCO meeting on "Environmental Education in the

² <http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter36.htm>, retrieved on 14-12-03

School Curriculum” was held in Nevada, USA, in 1970. The meeting resulted in a widely adopted definition of EE:

Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture, and his biophysical surroundings (IUCN 1970, cited in Palmer, p.3-4).

Since then such documents as *the Belgrade Charter*³, *the Tbilisi Declaration*⁴, *the World Conservation Strategy*⁵, *Our Common Future*⁶, and *Agenda 21*⁷ have translated global definitions, objectives, and principles of EE into specific policies and programs.

Along with the increasing interest in EE, other kinds of more specific ”environmental educations” have emerged, such as development education, global education, peace education, citizenship education, and human-rights education. (Palmer, p.4). These developments within EE demonstrate its relation to many aspects of science and human life; they demonstrate how important is the role of education in shaping pro-environmental behavior for the better future in the better place for all.

Environmental Education For The 21st Century

Dramatic change in the scale of human population and human activities has impacted the environment during the second half of the 20th century in the way unprecedented before. It is the task of the people who will live in the 21st century to stop and reverse, if possible, the destructive changes. In order to tackle environmental crisis from all possible facets, it has to be treated more than just issues of pollution, and recourse depletion. Environmental crisis is a

³ *the Belgrade Charter* – International Environmental Education Programme formulated by UNEP and UNESCO in 1975 in Belgrade

⁴ *the Tbilisi Declaration* - document of international consensus about integrating environmental education into development strategies

⁵ *the World Conservation Strategy* – developed by UICN, UNEP and WWF in 1980, it highlights the importance of resource conservation through sustainable development and state that conservation and development are mutually inter-dependent.

⁶ *Our Common Future* – is a program document of the WCED of 1987 which brings forward the concept of sustainable development with integrated environmental concern, also known as the Brundtland Report (WCED, 1987)

⁷ *Agenda 21* – program document of the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, which focuses on how to move towards sustainable development

political, social and esthetical phenomenon, more than just a technical one, and needs to be approached as such.

Introduction of the concept of sustainable development, or of the sustainable life style, as educationalists prefer to phrase it, brings coherence into the understanding of the crisis, which goes beyond scientific domain. It welcomes human dimension and makes explicit the environment-development interaction and its implications for the environmental condition.

Human dimension widens EE beyond solely teaching *about* the environment. EE is about interaction between humans and the environment, its mutual implications and shaping pro-environmental behavior to prevent detrimental effects of the interaction. We agree with Palmer, that it is important to focus on the human dimension in order to make positive environmental change happen.

Action research and community problem solving need to be incorporated in EE, argues Palmer, as part of 'empowerment' and 'capacity building' policies that aim at students' personal involvement, action, and decision-making in relation to social and ecological issues in their community (ibid, p.9). As we move forward in understanding the depths of interrelatedness between environmental, human and scientific issues, we expand the vision of problems. EE should develop approaches and strategies in teaching and learning, which would reflect the depth and multi-facetness of the environmental-human relation. Today EE is about 'equality, social justice, interspecies justice, and intergenerational justice' (ibid).

It is essential, continues Palmer, 'that the fundamental importance of EE is recognized at all levels in society-within formal education, nongovernmental organizations (NGOs), and local and governmental policy frameworks. Environmental education must be placed at the heart of policy and curriculum development processes' (ibid).

Beginning of Research and Problem Statement

This project investigates a specific environmental education activity called nature interpretation (NI), which is a synthesis of science and art, ecology and story telling, archeology and biology, history and tacit experience. It has stemmed and developed at the national parks of the USA in 1950s, and has been established as an institution in Denmark in

1986, first as a three year long experiment. The basic principles of NI, the concept and history of NI are treated in detail in chapter 2.

Interpretation of nature is the interest focus of the project because it is an alternative way of teaching about nature. Pedagogic approach to the subject of teaching seems to appeal to other than intellectual perception, and the pedagogic process takes place within the subject environment – the nature. It is interesting to investigate the pedagogic approach and the philosophy behind it.

NI interpretation is a rather developed institution with a lot of various activities going on regular basis all over Denmark – in every city, in every commune. It is a popular leisure time activity for, especially for families with children. Alternative approach to environmental education on the background of high public demand has stemmed the initial curiosity for going into NI research.

My initial research of the spectrum of NI activities has revealed that among all ages, social and professional groups, school children are the biggest target group of NI in Denmark. Why do nature interpreters concentrate on children more than on other age groups? To answer this question I have viewed literature on the Danish NI, as well as have conducted interviews with nature interpreters. My pre-assumption is that there are at least three reasons for that: 1) it is the growing up generation that will have to take care of the natural environment in the next decades; 2) it is easier to teach children, than grown-ups, it is easier to shape attitudes and life style habits in a young developing personality; 3) it is easier to organize NI for children, as every child attends a public school, and they are already organized in groups- classes.

In order to perform NI for children, an institution of nature schools has been started and developed since the launch of the NI experiment in 1986. There was a debate within the NI operators and administrators (Skov- og Natur Styrelsen) whether to keep nature interpreters and nature schools as one common network, or to separate them into two different institutions. The outcome of the debate was to maintain one common network, which, according to interview data, has proved to be very useful for internal flexibility and networking of NI system.

Having NI as an interest area in focus, the significance of school children as the main target group has determined the direction of our investigation into a nature school and its role in raising environmental awareness among school children. The project was seen as a research about impacts of NI on environmental awareness. The effectiveness of NI is an important dimension for evaluation to justify its existence and to gain political support, and consequently secure state funding. Therefore there is an enormous scientific interest around the "impacts" and the ways to measure them. The supposed plan was to observe NI interpretation sessions with children, and then interview nature interpreters on their evaluation of the impacts. It seemed logical to do so, however, the plan proved to be impossible to carry out.

Preliminary research has revealed that it is impossible to answer a question if NI raises children's environmental awareness. Children's knowledge about nature, nature's life-sustaining functions, and aesthetic value can be formed by formal education at school, in a family, or other circumstances. It is very difficult to isolate the effect of naturevejledning itself. There is a belief that the positive and active experience in nature brings nature and its protection closer to children's minds and hearts, and that this experience will contribute to environmental awareness raising along with other factors.

Nature interpreters are unable to give any evaluations on the impacts of their sessions, because they deal with each individual class on average once a year, twice at the most. This frequency does not allow a nature interpreter to remember even children's names, let alone their personalities and developments.

In the course of familiarizing with the nature interpreters and nature schools, the direction of the research has started to take a new curve. Realizing how difficult it might be to evaluate impacts, given the time resource, a new focus had to be chosen.

Identification of effective pedagogic methodology became the new focus.

Alternative approach to teaching at nature schools seemed to offer a lot of space for method research. What is this so called alternative approach? How does it work, and how is it different from conventional methods of teaching? Identifying the basic methods and the most effective methods for the given approach became ever more attractive goal.

Methodology is an interest and problematique in its own, and we do not refrain from studying this aspect. However, whatever little experience from observing nature interpretation we have got, it leads to a clear understanding, that relatively well developed and researched

methodology stands on institutional grounds which in some cases prove to be a strong resource and in other cases lack consistency in linking up with educational practice. In order to bear its fruit, methodology, as an important tool for successful NI, needs strong links with institutions that have the capacity to implement/incorporate/extend the experience of nature interpretation into other spheres of life (reality of every day life).

Talking about NI in general, the "institutional grounds" would be, e.g. environmental management in a municipality, where inhabitants are encouraged to lead sustainable life style; where they are given an incentive to separate their waste, to conserve water and energy, etc.; where directly and indirectly, formally and informally they are educated about environmental problems and why and how to deal with them.

However, the main target group of nature interpretation in Denmark is children and families with children. Children are the main interest and main focus of nature interpreters. Probably, because, they are the best potential recipients of the "teaching", and they are the people who will have to take care of the nature in the near future. Probably, the choice of methods and tools applicable to children is wider than that suitable for grown ups. Additional advantage of targeting children is that it is much easier to organize their environmental consciousness development by education in cooperation with schools. It is possible to virtually include every child in nature interpretation activity, which obviously is not the case with adults.

Nature schools in Denmark are the place for nature interpretation for children.

There is a high public demand for organized experiences in the nature. In fact, the demand is much higher than the capacity of the nature schools. On average, there is one nature school in a municipality; sometimes two municipalities share one nature school. Bookings for visits for up coming school year are made by schools already in May, and often a schools schedule is booked until the end of the academic year at once. Those schools that fail to contact a nature school in time would hardly be able to take their children to a nature school.

What is behind this high demand? This is one of the research questions of the project.

What are the ethical, aesthetical, philosophical considerations? What is the connection to the national culture? I hope to be able to explore or, at least, mention these aspects of nature interpretation in Denmark.

As an institution dealing exclusively with environmental education, namely NI, for school children, nature school is the place to observe pedagogic approach that addresses all senses,

employs active participation and practical experience in nature as the basic method. There are variations in every school, and with every nature interpreter, but the basic method is one: giving children experiences in nature where they activate and use all their senses. The idea behind the method is that experience causes curiosity, curiosity causes knowledge, knowledge causes care. Loving through learning, learning through experiencing.

Once again, preliminary research leads to an unexpected conclusion: the methodology was obviously well on the track and successfully implemented. Thus the study of effective methods seemed to be not worthy. There appeared to be no lack of creativity and enthusiasm from nature interpreters. The "practical" method gives plenty of space to employ particular pedagogic tools, which cannot be numbered, and vary from theme to theme, from nature interpreter to nature interpreter. Investigation could not identify an obvious problem in methodology.

However, it has brought in other variables important to successful NI.

We have observed a variety of sessions with a variety of methods at nature schools. There seems to be no lack of successful methodology, although there is always space for new developments. If nature schools are a success in their own, and the desirable quality of NI is almost reached, what is the problem in question?

A natural question to ask would be: when children leave a nature school, what happens to the experiences and knowledge they found there? How do they remember it? Do they want to come back to these experiences in one way or another? Are they reminded about these experiences? Are they encouraged to reflect on them and get their own opinion about what they have experienced?

The weak link comes up when I try to answer those questions. Statements of nature interpreters as well as my own observations confirm an obvious problem. It lies in the domain of cooperation and communication between public schools and nature schools. Often they work well together, but in many cases there is little cooperation between public schools and nature schools on the level of subject teaching and curriculum. Some classes are not prepared for the visit to a nature school, and their teachers do not integrate and use the nature school experience in their subject teaching. Although, it seems to be a natural thing to do, especially in nature & technique classes. Despite of geography and biology being taught at school, some

children are shockingly ignorant about anything connected to nature, or agriculture. As nature interpreters claim, some children do not know the most common birds that live in urban areas. Some even do not know that milk and meat come from cattle farms, and not just from a supermarket, and that humans have to kill in order to eat meat.

Problematique of cooperation between schools and nature schools brings a new curve into the project. It is still related to methodology, but the main focus lies within communication of pedagogic practices between nature schools and public schools.

How does pedagogic practice of nature schools relate to the common pedagogic practice in public school? Are there any commonalities, and what are the differences? Does a public school use this approach in certain subjects? These are just a few research questions around the **problem formulation** of our research:

How can public schools and nature schools improve their cooperation for more efficient use of a nature school resource for environmental education?

Methodology

1. RESEARCH DESIGN AND TARGET GROUP

The study is an analytical examination of the circumstances influencing public school teachers to use nature schools to supplement their subject teaching with practical experiences.

In order to answer the problem question, the following primary and secondary research has been conducted.

Chapter 1. Introduction

In this chapter, we familiarize a reader with the area of research, our motivation and curiosity to investigate NI as a alternative approach to environmental education based on the nature schools in Denmark. The problem in focus and our approach to it are introduced.

Dilemma of the environmental problematique and pursuit of solutions to it leads us to the importance of raising general environmental awareness. Formal education has been the

common channel of environmental education since this concept has been introduced. The focus of our interest then narrows down to the environmental education for children as the group that will carry the responsibility for the future of our environment.

Brief review of the main trends and research in EE for children up to date creates theoretical framework and context for our specific interest in alternative approaches to environmental education for children.

We were looking for a research in Denmark and in the vicinity of Copenhagen for sake of convenience in obtaining empirical data.

Denmark has developed an alternative informal nature education institution such as NI, which has become very popular through the decades of its operation, and has acquired high legal status and integration through out the country.

Discussion about the pedagogic practice at nature schools leads to the research questions, the problem formulation, and methodology of answering these questions.

Chapter 2. Historical background of NI

This chapter offers a retrospective view and reflections upon the history of nature interpretation.

It is an account of “Interpreting Our Heritage” by Freeman Tilden - the major literal source of reference to what is Interpretation and nature interpretation.

Principles of Interpretation formulated by Tilden remain almost unchanged in the Danish Nature Interpretation Service.

Charter 3. Nature interpretation and nature schools in Denmark

NI in Denmark. Description of institutional features, organisations, networks, activities, strategies, methods, and funding.

Nature schools. Regulation. Links to public schools.

In the search for literature about NI in Denmark we obtained a few published and unpublished materials from nature interpreters. Since the material available in English is rather limited, a few descriptive interviews have been taken with nature interpreters and other experts.

An interview with Peder Agger created additional knowledge on nature conservation issues in relation to environmental education, on the political importance of nature education and education in the nature. Peder Agger refers to so called nature kindergartens where children

spend all the time in the nature. To him, these children are noticeably happier people and much more familiar with nature.

Interviews with nature interpreters Arne Bondo Andersen, Jes Aagaard and Jacob Jensen brought light onto the latest trends in NI development and current projects. Philosophy and methodology of NI has been discussed as well. These interviews have given us an idea about the NI system as well as directed us to the key experts and interesting nature schools.

This knowledge then helped to orient the further primary research.

The first visit to a nature school has led to a shift in research focus from impacts of NI to methodology and then further to cooperation between nature schools and public schools. The central target group changed as well – from nature interpreters to public school teachers.

The central target group is public school teachers of different subjects from different schools. The choice of the teachers was determined by their active cooperation with nature schools in some cases, and in other cases, randomly.

Two main types of data were collected. This was primary and secondary data. The former was collected from the main target group and the latter from other target groups, as well as from both published and unpublished materials including journals, newsletters, books and Internet. Organizations, such as the Forest- and Nature Agency and the Danish Outdoor Council were contacted to obtain secondary data.

Chapter 4. Theoretical background

This chapter provides theoretical and conceptual framework for better understanding of pedagogic practices at nature schools and public schools.

Pedagogic philosophies and theories applied in both public schools and nature schools are investigated and compared.

Review of literature on EE research and empirical observations from nature schools led us to choose deep ecology and Action Competence (AC) approach as interesting and relevant philosophies. We identify relevance of the chosen theories from the case studies. We find it challenging to discuss more holistic spiritual approach to nature in combination with an action oriented instrumental approach. Deep ecology has relevance as its view on man/nature relation resembles with the principles of NI. AC seems to be relevant as it is in the center of pedagogic discussion about alternative EE. It appears to be a dominant EE research area in Denmark.

In order to illustrate the theoretical discussion we include observational accounts of three sessions and apply the discussion to each case.

We conclude the theoretical chapter with introduction of the theory of tacit knowing, which forms a foundation for discussion of experiential and cognitive knowledge and learning.

Chapter 5. Interview analysis.

This chapter analyses interviews with public school teachers. Analytical technique is discussed in the methodology subchapter of the introduction: narrative approach within major categorization between pedagogic and institutional lines.

Public school teachers are interviewed about their

- pedagogic practice in relation to nature education
- in particular, pedagogic practice in relation to the specific session observed by the researcher at a nature school
- reflection on pedagogic and institutional cooperation and communication between nature schools and public schools

The first phase of data collection was participatory observation of nature interpretation sessions at nature schools. Upon observation teachers of the participated class were asked to give an interview at a later stage. All teachers have been cooperative and willing to be interviewed. They were also offered and provided an interview guide with suggested questions in order to orient them about the matters under discussions and also make them feel comfortable about the subject of an interview. Interviews with teachers have been done at different times during four months, not before three weeks after the session at a nature school, and no later than four months after the session.

Each session stands as an individual case study, and it is observed and recorded. Interviews with public school teachers are to provide data for each individual session; therefore one or two teachers per each case study are interviewed.

Nature interpreters were interviewed randomly, and not necessarily for each individual case study. The information from the interviews with nature interpreters helps to get a better picture of case studies as well as knowledge about nature interpreters' pedagogic practices.

- 1) Nature Interpreters are interviewed about their
 - pedagogic practice in relation to public school education
 - in particular, content, methodology, and purpose of the specific session observed by the researcher at a nature school
 - reflection on pedagogic and institutional cooperation and communication between nature schools and public schools

- 2) Prior to interviewing nature interpreters and public school teachers, the researcher chose a few sessions at different nature schools to be case studies for the research. The sessions were observed, and thereafter recorded on paper in a form of abstract. These observations are intended to be used as an additional source of empirical data of pedagogic practices of nature schools (along with interviews of nature interpreters).

Limitations of the project

The total number of seven sessions was observed and recorded and the total number ten schoolteachers was interviewed. Due to the time limit, we were not able to use all the collected empirical material. Only six out of nine interviews with schoolteachers are included in the research. And only three observations are included as illustration in the theoretical chapter.

Five interviews have been taken with nature interpreters, three of them tape-recorded..

The first two interviews of the project were taken with an experts in the field of nature conservation and an expert in nature interpretation for general orientation within the research area.

These seven interviews have not been included as data in the project due to time limitation. However, we refer to the information retrieved from these interviews on a number of occasions.

Condensed transcriptions of the six interviews are attached in appendix for reference purpose.

Chapter 6. Conclusions.

This chapter draws conclusions from the data analysis.

Analysis of interviews with nature interpreters was supposed to answer the questions about the regular pedagogic practice of nature schools, institutional settings around, motivation of nature interpreters and the link to public schools.

How does a nature school work to better supplement formal education and enhance nature education within the framework of public and nature schools?

What is the motivation for nature interpreters?

Although we could not use these interviews as primary data for analysis, the above questions have been partially answered through the analysis of the interviews with schoolteachers.

Analysis of interviews with public schools teachers answer the problem formulation through narration of each case studied.

This data reveals how the teaching practice at nature schools aligns with the teaching practice at public schools. How do these practices "interact"? Do they overlap? Do they influence each other, and how?

These research questions of the pedagogic dimension are answered with emphasis on transfer and continuity of nature education practice and ideas between nature schools and public schools.

The institutional story line leads to the conclusion about the optimal institutional settings and links for the best possible and extensive transfer of nature school education into public school teaching practice.

2. SELECTION CRITERIA FOR STUDIED CASES.

Initially, my intention was to choose sessions randomly, rather based on a theme or on an already established contact with a nature interpreter. However, at an early stage of investigation, we discovered that it is more important for the quality of data to study sessions with those classes, whose teachers are known by nature schools as "active" and "interested"⁸. Given the chosen number of cases to be selected (six sessions) and the explorative nature of the study, it became obvious that for learning about the optimal institutional and pedagogic set up for nature education in public schools the best practice cases would provide the most data. It is the "eager" schoolteachers who would have the best knowledge and experience from nature schools as well as of the institutional aspects of cooperation with nature schools. It is our pre-assumption that those teachers, who, due to stress and heavy work load or other reasons, are not actively cooperating with nature schools, will have considerably less knowledge of the institutional and pedagogic aspects that are important to this cooperation.

⁸ Schoolteachers with strong motivation and personal positive attitude for nature education and experiences are referred to as 'active', 'interested', or 'eager' in the context of the research.

We could have chosen to build on cases where NI and nature schools have little role to play, and go into investigating why has nature school not been able to reach out to those particular public schools and teachers. At least, in those cases a lot could be improved in terms of integrating NI into education tools. However, we refrain from such an approach, because it would not answer the question of my curiosity: what are the optimal conditions for successful use of nature school resource? Those cases would supposedly give knowledge of the institutional barriers that are on the way of cooperation with nature schools, knowledge of what could be improved. But given a second thought, how can we know what and how to improve, if we have no knowledge of the "improved" cases? The "passive"⁹ teachers might not even know the real problems of the cooperation, if they have not been active in that cooperation.

Taking departure in the best cases, we will not be able to generalize my findings for all public schools. They speak for the cases chosen, and thus for certain kind of pedagogic and institutional set up, which is likely to be more resourceful than the set up where schools are not actively cooperating with nature schools. We suppose, that the research findings are valid also for the latter kind of schools (let's call them "laggards"), but on top of the other recourses that the "active" schools already have.

Given the exploratory nature of the study, we are not able to make prediction as on the character of my findings, but we intend to learn from the best practices what are the patterns of the optimal current institutional set ups, what could be improved, and what are the hindrances to do so. We are convinced that only a research of the best cases can produce such new knowledge.

A selection criteria of secondary importance was a recommendation by an expert to contact certain nature schools, where staff is known in the NI network as being active and creative in their daily work of nature interpreting, in approaching public schools with suitable offers, as well as in inventing and applying new tools for performing NI for children. We have contacted two nature schools, which were considered as "successful" and the third one, regardless of its reputation, because it is located in the vicinity of the researcher's own premises.

Themes of the sessions observed were not considered as selection criteria, because a choice of a theme has little importance for our investigation. Some themes are rather scientific, others

⁹ Schoolteachers with lack of motivation or personal attitude for nature education and experiences are referred to as 'passive' in the context of the research.

more artistic; it is not the content of the session that is in the focus of the research, but what and how is it used by the participating schoolteacher in the classroom work with children. In every case, it was up to the teacher how much he or she could use the material of the theme for his or her classroom work.

Then "random" attribute became hardly applicable to the selection criteria. Most sessions under investigation took place in nature schools that are known as "progressive" and "active" (Raadvad Naturskole, Taarnby Naturskole at the Amager Naturcentre). Most sessions, when it was possible, were chosen with teachers that are known by nature interpreters as "active", "interested", and "cooperating". However, for the sake of diversity, we have also chosen a few sessions when it was not possible to know beforehand whether the teachers concerned are "active" and "interested" (the deer tour in Jægersborg Dyrehaven, the session at the Taarnby Naturskole about birds, and the session at the Vestskoven's Naturskole about signs of spring). I am pleased to admit that all teachers, gave an impression of good professionals and showed interest and active participation during the sessions and also otherwise, in general cooperation with nature schools.

3.SELECTED SESSIONS.

Six sessions were chosen to be investigated. This number does not pursue any degree of representativeness. In an explorative study like this one or two cases could be sufficient. However, the ix different cases would bring in some diversity and allow for any errors. Given the time and travel resources, all sessions chosen took place within the Bigger Copenhagen area.

It happened to be so that three of the cases under research originate from Raadvad Naturskole. One from Vestkoven's Naturskole, one from Taarnby Naturskole, one nature interpretation tour administered by Jægersborg Forest District took place in the Jægersborg park, outside a nature school.

4.OBSERVATIONS

All sessions have been observed and recorded in an abstract form. These observations serve as the point of departure for further research about what is being done for enhancing educational gains from nature schools. They provide context for qualitative interviews, which are conducted with the participated public school teachers at a later stage.

Observations could have been used to problematize, to take a critical position to the findings from the interview analysis.

5. INTERVIEWS

An observation of a session gives way to the next step in the investigation: qualitative interview research.

The choice of the method is important to the overall success of the research for its' effectiveness in answering research questions in a flexible manner. This is an advantage compared to using questionnaire in a research. Interview allows respondents to relax and provide information they would not have given during a questionnaire survey. It therefore allows a researcher to obtain more data, and to get an actual feeling of what goes through the minds of respondents (Kvale, p.12). Interview questions are open and loose, compared to rigid and unambiguous questions of a questionnaire, and allow for changes during actual data collection on the field. It is also easier to validate responses in an interview by observing and adding to the information collected than it is for a questionnaire, which has a range of possible answers. An interview also gains more relaxed answers from respondents than questionnaire which guides to choose answers from an available range. In summary, an interview is a better-suited method for the given research, than a questionnaire.

In order to explore the 'life world'¹⁰ of teachers in terms of their professional practices, semi-structured interview conversation, according to Kvale, has the highest potential for creating new knowledge. Personal live interaction, framed in a professional context, gives space for variations during the course of a conversation, for example, to probe and follow up a certain statement of a subject by asking direct and specific questions.

The flexibility and depth of the method is regarded as an advantage, while the disadvantage is a possibility of unpredictable or controversial findings, which can be difficult to analyze in a systematic fashion.

According to Kvale, there is no such thing as a perfect interview, because the success of it depends on the interpretation by a researcher, the theme or a point of view he or she chooses in the analysis. Hamlet's interview, cited by Kvale, is a brilliant example of multiple interpretations of the same interview, as the one about perception of reality, and the other- of a personality.

¹⁰ In this context: work environment and professional activity of schoolteachers

6. INTERVIEW GUIDE

In the interview guide for the research in question, I have included two main aspects of the cooperation between public schools and nature schools.

In the process of composing a guide, it became clear that the focus of interest lies in two dimensions: pedagogical and institutional.

Pedagogical dimension is investigated to answer the WHAT question: it is an attempt to reconstruct interaction in the chain nature *interpreter* – *school teacher* – *pupils* in relation to WHAT a school teacher does (or does not do) at home school with the same class in relation to a particular session at a nature school.

Institutional dimension is investigated to answer the WHY question: what are conditions and requirements of public schools in relation to utilization of nature education resources, nature schools, in particular. Why do teachers take their classes to nature schools?

At this stage of research it appears that the boundary between institutional and pedagogic spheres is rather subtle, and answers to both WHAT and WHY questions may be found in both the spheres. It is an experimental effort to distinguish the two dimensions; I refer to the institutional as formal relations between a public school and a nature school as municipal establishments, where a nature school's mission is to supplement public school's formal education with practical experience. The pedagogic facet is seen as rather interpersonal cooperation between the three sets of partners: nature interpreter – pupils, nature interpreter – schoolteacher, schoolteacher – pupils.

A copy of the guide is attached in appendix for reference purposes.

7. TARGET GROUPS

Initially we wanted to evaluate effects of NI on environmental consciousness raising of school children. The first interviews with nature school guides made it clear that nature interpreters could not answer this question because they had no continuous contact with classes that came to visit a nature school on average once a year. The next logical step would be to interview children themselves, but it seemed to pose a huge challenge in terms of amount of empirical work and time expansion of the project. Evaluating children's environmental consciousness by means of interviews seems to be the most reliable way to validate research results. However, in order to follow up changes in a child's awareness and in his/her concept of nature that might happen due to nature school education, and get a relatively reliable results, it would require interviewing a number of children individually several times within an

extended time period (for example , one , two, or even three years). Due to time limitation of the present research, we refrained from interviewing children and chose to rely on evaluation of their environmental consciousness by their school teachers. Interviewing school teachers is a more feasible solution to the empirical task of the project, although this gives data which is secondary in relation to the research subjects (pupils). Teachers appear to be interview subjects and secondary source of primary data. In the course of empirical and theoretical investigation our focus continued to change. A few important and problematic issues have surfaced and captured our interest. Evaluation issue appeared to be too unclear to define and too hard to investigate. Instead we became interested in another aspect of NI and its effectiveness: how to maintain continuity of nature school education? We discussed expansion of our focus into this problematique earlier in this chapter.

We want to admit that interviewing children is important to our research, and could have given a different picture about the relationship between nature schools and public schools. Therefore we do not claim our empirical data to be objective and comprehensive. It is a way to answer our problem formulation from a position of a key actor in environmental education in the setting of nature schools and public schools. Our results reveal one side of the story of NI for school children, while there are many more sides of the story that could give it another meaning.

We have been fortunate to meet and work with very friendly and open teachers. Every teacher that we have asked for an interview has been very cooperative. Interviews were conducted at least two weeks after the session took place to give the teacher time and space for work and follow up on the theme of the session. In some cases two weeks were not enough to allow follow-up on activities due to various reasons, such as holidays, other thematic projects at school, etc. Then discussion was about the teacher's regular pedagogic practice in nature education.

A semi-structured interview guide was composed based on Stenar Kvale's theory of qualitative research interview. It was distributed to all interviewees at least a week prior to an interview in order to secure interviewees' confidence in the interview context and thereby to better facilitate qualitative responses. Interviewing was done at the schools where the teachers worked, in their normal work environment, where they felt comfortable.

Interviews with public school teachers have the purpose of creating new knowledge in the area of nature education of school children in Denmark.

When possible, a few interviews have been conducted also with those nature interpreters, who guided nature session. No specific interview guide was drawn up; the nature of those interviews was rather spontaneous. However, with focus on the activities of the session performed, their content, purpose, and the teaching methods employed. These interviews allow to view our data from the perspective of a nature interpreter.

A interview was conducted with a Raadvad nature school leader, Dorrit Hansen, about the school's pedagogic practice and cooperation with public schools.

Another interview was conducted with a teacher from Enghave School, Inga Friis, who is a regular user of an ecobase attached to the school, and she is also a teacher who is very "active" and experiences in nature education. This interview brings a new variation into the research, as it deals with another institution of nature education – an ecobase.

Ecobase

It is a facility, often a house, located in the woods, and equipped with tools for various activities in the nature. One eco base is used by a few "attached" public schools within the Commune (there are seven ecobases in the Copenhagen Commune). An ecobase, like a nature school, has a nature interpreter, but as there are much more classes of school children to be guided, he or she is not able to work with every individual class. Education is then organized in two alternative ways. One way is to combine two or more classes from the same grade. Another way is to teach teachers how to use an ecobase. The second option was, in fact, the goal of setting up ecobases. The successes and failures of this project are treated in an interview with Inga Friis.

We wanted to include this interview into the project, because it enriches the context of nature education for school children, and brings along interesting options for comparison. Unfortunately, I am not able to use this very interesting material due to time limitations.

In the phase of preliminary research four descriptive interviews have been conducted with distinguished nature interpreters with the purpose of collected information about nature interpretation and Denmark and its methodology. These interviews have become a source of information that is not easily available in English.

8. DATA ANALYSIS: INTERVIEWS

All interviews were transcribed. Interviews with teachers are analyzed as empirical research data.

Kvale's approach was an inspiration to the method of our data analysis.

The first step of analysis was to structure large interview material under seven research questions, which were formulated in accordance with interview questions.

The second step was to condense the material under each question.

The third step was to clarify interview material by eliminating digressions and repetitions, distinguishing between essential and non-essential.

The fourth step was to structure the material from all the six interviews into one narrative, which would answer the research questions in the light of all the interviews.

The type of research determines the choice of an analytical method.

For identifying new meanings and common patterns in the teachers' interviews, a combination of a few methods, such as condensation, categorization, and narration are employed.

All the six interview subjects were asked to verify the interview transcriptions and gave permission to use their names in this report.

Chapter 2.

Definition And Historical Background of Nature Interpretation

1. Introduction

The first attempt to analyze and give a comprehensive definition and explanation of what is nature interpretation was made by Freeman Tilden in "Interpreting Our Heritage".

The 1st edition appeared in 1957. Until then there was no attempt to analyze this new discipline. In 1960s the book became a basic guide in the field, and a textbook for instruction in the park management.

"Freeman Tilden wrote about fundamentals-the guiding principles and underlying philosophy of the interpreter's art and craft. As pioneer of interpretive philosophy and recognized father of modern park interpretation, Tilden, through *Interpreting Our Heritage*, has made a profound mark on the park conservation movement in America.[...]Accepted classic in the literature of park management. [...] His message remains as fresh as ever"(Foreword to the Third Edition, by Gary Everhardt, Director of National Park Service, 1976, p. XI).

NI was developed in The National Park Service of the USA, and became one of its most important single activities.

2. History

Until 1960s there was a gap between scholars and amateurs in historical science. The scholars developed an attitude of a closed community, while their works were written in a strictly scientific and dry manner, which was not intelligible to laymen.

The efforts of amateurs were directed to bringing science and general public to a common point of understanding. However, as they were not supported by real science, and that undoubtedly was reflected in the quality of their media. It was clear that in order to bring this situation into balance a new kind of mediating discipline or science in the field of history had to be developed. This could be achieved in cooperation between scholars and amateurs, which started to take place in 1960s. As a result, the quality of amateurs' products has considerably improved, and the public has been reached through books, newspapers, magazines, television and radio. The flow of adapted knowledge has encouraged even greater public interest in

natural and cultural history. In the Preface *To The Second Edition to Interpreting Our Heritage* Christopher Crittenden brings an example of a book-magazine *American Heritage* that was very successful in making social studies “vividly interesting” and thereby won “large scale popular approval and support” (Tilden: xvii).

Growing public appetite for knowledge stimulated emergence of this new “means of reaching people” through museums, parks and historic parks (ibid). This new channel of mass communication has come to be called “interpretation”.

Through experimenting with different devices, workers in parks, museums and historical sites in US began to develop new techniques and methods of telling their story. This became a new approach in educating and communicating our common heritage to people through re-animating the history, science and nature into a real and vivid picture/image/whole.

3. Definition of Interpretation

“For dictionary purposes [...] the function called Interpretation by the National Park Services, by state and municipal parks, by museums and similar cultural institutions is as follows:

An educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information”(ibid, Part One, p. 8).

The true interpreter does not limit himself to a book definition, through his own research and trial he finds his own definition. ”Besides being ready in his information and studious in his use of research, he goes beyond the apparent to the real, beyond a part to a whole, beyond a truth to a more important truth”(ibid).

Tilden offers two concepts of Interpretation. One is for interpreter’s private contemplation, and another - for the public. The first: “Interpretation is the revelation of a larger truth that lies behind any statement of fact” (ibid). “The other is more correctly described as an admonition, perhaps: Interpretation should capitalize mere curiosity for the enrichment of the human mind and spirit.” He admits that the definition is neither final, nor too inclusive. And he also expresses hope that interpreters will have their own as valid definitions.

Tilden suggests six guiding principles of Interpretation, which, he believes, will help to correctly direct the interpretive effort:

- I. Any Interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile.
- II. Information, as such, is not Interpretation. Interpretation is revelation based upon information. But they are entirely different things. However, all interpretation includes information.
- III. Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical or architectural. Any art is in some degree teachable.
- IV. The chief aim of Interpretation is not instruction, but provocation.
- V. Interpretation should aim to present a whole rather than a part, and must address itself to the whole man rather than any phase.
- VI. Interpretation addressed to children (say, up to the age of twelve) should not be a dilution of the presentation to adults, but should follow a fundamentally different approach. To be at its best it will require a separate program.”

4. Principles of Interpretation

1. The Visitor’s first interest.

The main idea based on observations of more than a century (starting with Frederick Law Olmsted in 1865)¹¹, is that being in nature and seeing its beauty is not only a momentary pleasure, but it increases capacity for happiness in the future.

This principle investigates what is the chief interest of a visitor to come to a nature site, and, furthermore, how can it be met in the process of nature interpretation. The answer given by Tilden is: ”The visitor’s first interest is in whatever touches his personality, his experience and his ideals”(Tilden, p.11). The key word is happiness, and Tilden continues with discourse about a need of an individual to identify with a group, certain other individuals, and happiness: neither the parks and museums, nor anything nature interpreter can say about them can make anyone happy, but the teaming of the two in adjustment to the individual group interest ”can bring to life their hidden capacities for happiness”(ibid). Possibility to identify brings certainty, which is one attribute of happiness. Certain personal association with the subject of interpretation allows for personal involvement, and this is what has remained an

¹¹ Tilden, p.11

important intermediate goal of nature interpretation through out its development internationally, and particularly in Denmark.

A visitor may not know what impulse has brought him to a nature site, but he is there according to Tilden, in search of self-identification, and therefore he is in a receptive mood. The challenge of a nature interpreter is to capitalize on this openness of a visitor's mind by connecting his ego with the chain of his revelations.

II. Information and interpretation are two different things.

Interpretation is based on facts, but it is not mere dispensation of pure facts. It sacrifices details for a vivid whole image, brings life and personal touch of the interpreter to events and connects them to the present time and place. "True interpretation deals not with parts, but with a historical – and I would say spiritual - whole" (Tilden, p.25).

III. Interpreter is an artist who gives a performance to a group of people who are there seeking enjoyment, rather than instruction. An interpreter tells a story using his own artistic imagination and skills of expression and communication.

Tilden quotes G.K.Chesterton: "the soul of a landscape is a story, and the soul of a story is a personality" (Tilden, p.29). Tilden claims that interpretation is a teachable art, as long as its principles are understood. The form of interpretation is essential to entertain and capture curiosity and interest of a man on holiday.

An interpreter disregards minor details and leads his visitors through the main story, which along the way becomes their story as well.

Interpretation requires skills in a number of arts, while the most important of them is rhetoric – the art of speaking and writing. Especially, the presentation of ideas in whatever situation an interpreter finds himself.

IV. Interpretation is provocation for a visitor to search for meanings of things by himself. Interpreter's task is to create interest and connection between a visitor and a subject of interpretation, he guides through the story and soul of a landscape, while leaving enough space for a visitor to discover the subject for himself. Interpreter has to be careful not to overload visitors with plentiful accurate facts, which might turn the process of common discovery into a dry scientific instruction. He attempts to expose a sole of things rather than names of things.

Tilden quotes a statement from the Park Service Administration Manual, which is the complete expression of essence and purpose of Interpretation: "Through interpretation, understanding; through understanding, appreciation; through appreciation, protection". This sequence has become the central idea of the Danish Nature Interpretation Service.

True interpretation creates consciousness, that Man and Nature are inseparable, and that by vandalizing nature or any beautiful thing, be it natural or man made, a man vandalizes himself.

Love of nature expressed by the interpreter in his manifestations and story is a provocation, which translates into understanding.

V. Tilden suggests that a cardinal purpose of Interpretation "is to present a whole rather than a part, no matter how interesting the specific part may be" (ibid, 40). On the other hand, he speaks about addressing a visitor as a whole man with his background, experience, interest and moods. Good and understanding interpretation will not make a mistake of overestimating visitor's knowledge of a subject, and of underestimating visitors' intelligence. All facets of a visitor's personality should be considered in shaping a story of interpretation: "his religious spirit, his emotions, his yearning for continuity, his love of a story, his physical pleasures" (ibid, p. 46)

VI. Tilden suggests, that despite of the opinion that, children until a certain age are not able to deal with abstractions and therefore they perceive each thing individually out of the context with other things; there are ways to explain to them quite complex concepts. He brings an example of "ecology" which is supposed to be a hard word, but when explained as life community of grasses and trees, of insects and birds, of rodents and reptiles, whose fortunes were bound together in their "home" place", becomes fascinating. So "ecology" became an easy word by associating living things, it was possible for children to cohere remote things (Tilden, p.52).

NI for children

Children in earliest school years learn new words at a rate higher than adults ever do. Young children are obviously showing more eagerness for pure information than adults. These specific characteristics of different ages, Tilden argues, indicate that approach to interpretation for children should be different from that for adults.

Different characteristics of interpretation for children, suggested by Tilden:

- a) delight in the superlative: the biggest or the smallest egg, prehistoric skeleton, etc.
- b) the love of personal examination, through other three senses than sight and hearing: smelling, touching, tasting
- c) the fact must indeed be facts, as “everything for a young mind stands by itself” (Emerson, cited in Tilden, p.49)
- d) “interpretation for children requires a very special talent” (Tilden, p. 51). It is to turn instruction into companionship. Children’s first-hand experience in places of visit must be different from those in a classroom. The story and adventure are uppermost here.
- e) children are not afraid to ask questions, unlike adults, they are not afraid to say a wrong thing.

Pre-visit material

Colonial Williamsburg, whom Tilden refers to, has largely used pre-visit materials, and claims that those children who have been introduced to briefing materials have a better learning experience on a visit site. Many institutions in US at the time when Tilden wrote the book, were supplying schools with pre-visit materials, such as orientation folders, descriptive literature, film-strips on loan, and other. These materials help to capitalize on children’s ability to associate themselves with the scene.

Tilden argues, that the ability to effectively interpret for children could be an indicator of success for a museum, a historic place or another institution. It is easier to interest carefree young minds at the height of their receptivity, than those of adults engaged in a busy everyday life.

Re-creating Past: Connecting present landscape and cultural history.

Interpretation implies re-creation of the past, reaching intimacy between historical event and a visitor.

Two of interpretation devices are discussed by Tilden in this connection: demonstration and participation.

Demonstration is an effective educational device that allows reaching understanding of the subject much easier than by verbal description, and it provides a perfect opportunity for personal active involvement (if a subject of demonstration is an operatable unit or at least accessible for tacit contact).

Participation bears a special tacit meaning in interpretation. It has to be a physical act regarded as important by a visitor himself. Example: using an aboriginal stone axe in felling trees, burning, clearing and planting; collecting mushrooms, cooking and eating them.

Animation is “keeping the past a living reality” (ibid, p.77). Example from Tilden, (ibid, p.76): a historical site of a Mansion was animated by a girl dressed according to the epoch of the house and playing a piano piece of that time.

Interpretation of Beauty

“Beauty is a very real as well as an elusive thing, and it could be an element for the lack of which the human being would not care to live.” (Tilden, 84)

A beautiful site, a lake or a mountain, does not become more beautiful by being called as such. A wise interpreter lets the beauty of nature to speak for itself. His task is to find the best point from which it can be seen, and to discreetly create a sympathetic atmosphere, to tune visitor’s mind to seeing and comprehending a beautiful object.

Aesthetic sites do not necessarily need oral or written interpretation to be brought forward as such.

Everybody has his own perception of beauty, and therefore it is impossible and unnecessary to interpret beauty as such. However, interpreter’s mission here can be to build on a pure fact by creating a story, expressing love and admiration, etc., and thereby create not only knowledge, but inspiration.

Tilden thinks, that one of the finest uses of natural and cultural heritage areas is, through interpretation, to stimulate spiritual uplift. This can be achieved through a journey in beauty, with an interpreter as a companion in an adventure.

What is Beauty

There were many attempts to define and explain beauty by philosophers; yet, it is still a vague concept for a human mind. No matter how difficult it may be to express what is beauty, the feeling of it is very real in every human.

Nature does not intend beauty, it is Beauty in itself. 'Scenic manifestations is the glamour behind which lies an Absolute Beauty', says Tilden (ibid, p. 108).

"The Useful encourages itself", while the preservation and affirmation of Beauty needs a constant renewal of faith and the watchful devotion of a shepherd." (ibid, p. 109)

Four aspects of Beauty, by Tilden:

- a) Natural Beauty is a personal possession; it is a discovery of every individual. This aspect needs no interpretation, "it is an exhibit" (ibid, p. 110)
- b) Interpreter is involved in a kind of education, but an alternative one. He does not instruct a listener, does not something to a listener, but provokes a listener "to do something to himself" (ibid, p.111). It is a delicate job, as a visitor did not come to a park for education, he is there for pleasure and relaxation.
This is about appealing to visitor's heart in order to make him feel beauty. "Added to understanding, it is an objective of interpretation" (ibid, p. 112).
- c) Beauty of Artifact. "An interpreter is not dealing with beauty as such, but with man's attitude toward beauty"(ibid, p. 113).
- d) Beauty of human conduct, such as heroism shown in war times.

Principle of Love

"If you love the thing you interpret, and love the people who come to enjoy it, you need commit nothing to memory. For, if you love the thing, you not only have taken the gains to understand it to the limit of your capacity, but you also feel its special beauty in the general richness of life's beauty."(ibid, p. 90)

The six principles of interpretation may all be a single principle of Love.

Chapter 3.

Organisational structure of Nature Interpretation in Denmark

This chapter gives an overview of the main players - organisations and networks- of the Nature Interpretation service in Denmark. It describes what is the development of the way nature is interpreted and how it is perceived by public; what these actors claim their professional and educational objectives to be and what are the activities and strategies employed for every actor; how are they organised and how all the actors relate to each other; what are the sources of funding, public participation and links to public schools.

The formal education for nature interpreters is so far available only in Denmark. Being a unique phenomenon, it will be given some attention as well.

Furthermore, methodology is one of specific focuses of this research; in this chapter we would like to follow the development of the Danish nature interpretation methods.

In the broader prospective, we would like to highlight what is the aim of the Danish Nature Interpretation Service and how it contributes to sustainable development of the Danish society.

An overview of the existing nature interpretation organisation and the way it functions will provide the contextual framework for the research. It gives a reader tools for understanding specific concepts, terminology and approaches applied in the project, it helps to narrow down the focus and leads to answering the main research question: how can nature schools and public schools improve their cooperation for environmental education?

1. Definition of Nature Interpretation

" Nature guidance is [...] an explanation of a landscape's or an area's characteristic elements and connections which through direct experience leads to a discovery of, knowledge of, understanding for, respect and care for nature and the environment"¹².

The purpose is to communicate:

¹² Skov- og Naturstyrelsen, *Nature Guidance in Denmark*, <http://www.sns.dk/internet/guidance.htm>, retrieved on 24-05-2004

" that nature is a whole of the landscape, ocean, climate, plants, animals, history and culture which the human being is a part of, dependent of, and which it influences.
" that nature is both being protected and used,
" about subjects relating to the basis of nature, the nature jobs and the outdoor life,
" about the written and unwritten rules of activities and stay in the open country,
" about Danish and global environmental relations and participation towards a fruit bearing lifestyle,
" about nature in the cities and connections between the city life and environments"¹³.

1.1. Actors and Networks

The Danish Nature Interpretation Service was established by the Ministry of Environment in 1987. It is organised as a network coordinated by a secretariat. The Nature Interpretation Service is administered jointly by the Danish Ministry of Environment (MEM), the Outdoor Council (FLR) and the Nature and Forest Agency (SNS).

The Nature Interpretation Service Secretariat (NISS) fulfills administrative tasks and coordination of projects.

The Outdoor Council is an NGO and an umbrella organisation for a number of outdoor life and environmental NGOs. Along with the oldest environmental NGO called the Society for Nature Conservation, it is a major actor in nature interpretation activities in Denmark.

The Outdoor Council administers the Tips and Lotto Fund, where 50 % of the resources are dedicated to environmental and recreational projects.

In 1992 a forum for nature interpreters called the Danish Rangers' Association was established. Its main purposes are 1) to unite nature interpreters by the common professional and educational goals, and 2) facilitate communication and cooperation, and exchange of ideas and experience between nature interpreters 3) to enhance the quality of nature interpretation by developing methodology.

The Danish Rangers' Association is a member of the International Rangers' Federation.

¹³ Skov- og Naturstyrelsen, *Nature Guidance in Denmark*, <http://www.sns.dk/internat/guidance.htm>, retrieved on 24-05-2004

Four times per year the association publishes a magazine about Nature Interpretation in Denmark called *NATURvejleder*. The magazine gives a good overview of activities and organization of nature interpretation and contains articles by different enthusiastic nature interpreters on a wide spectrum of issues. Some write about their best practices in guiding activities, others write about their experience under nature interpretation education. It also includes local news, debate, information about networking, conferences, etc. The group of editors are dedicated volunteers.

Once a year in March, the Association holds an annual general meeting in conjunction with an annual conference. The annual general meeting results in election of a chairman and executive committee of the association. The annual conference is an occasion where the Danish nature interpreters can exchange their experience and ideas.

The conference in recent years has attracted over 100 participants each year, which is an indication of considerable success of the association's activity.

The magazine also cooperates with the Danish Nature Interpreters Network, in Danish called *Naturnet* (www.naturnet.dk), which is an electronic network. It is widely used by many nature interpreters daily, and it proved to be an excellent tool for communication of information, ideas and exchange of experience. An appointed nature guide works one day of his week exclusively with the network, as a network coordinator.

Naturnet provides information about all activities offered from different sources, be it a municipality or an agency. Themes are represented in "folders", which contains a description of tours, local maps, information about organizers, names and contact details of guides, target groups, language of the tour and conditions of participation. The most common target groups are 'families with children', 'children' and 'all' ('alle' in Danish) meaning 'everybody'. In most cases participation requires neither preliminary registration, nor a charge. For example, all tours by SNS are free of charge, and with no prior registration. Other organizations and NGOs might require registration by phone, and a small fee to cover costs, such as transportation (e.g. all day long tour to Mon Klint organized by the Danish Society for nature Conservation (DN)). On the other hand there is a calendar with currently organized events. Most events do not require pre-registration and are free of charge.

DN is another big actor on the scene of nature interpretation. It has local committees, such as the one in Alberstlund.

Under the same project, with the purpose of enhancing the quality of nature interpretation, regional networks have been developed to promote communication and cooperation. Interested and active nature interpreters hold regular regional meetings where they establish personal and professional connections with each other and learn from each other.

The network is associated with other environmental organizations and the secondary school teachers' association.

1.2. Funding of Nature Interpretation Service

NI service is run in cooperation between MEM, SNS and The Outdoor Council (FLR).

FLR administers a state own gambling agency Tips and Lotto. Some surplus from the agency income is assigned to recreation projects (ca. 80 mln DKr)

In order to employ a NI guide municipalities and organizations can apply for a grant with FLR. The grant amounts up to 200'000 DKr per year, which covers ca. 50 % of the costs incurring with employment of a nature interpreter. The remaining 50% of the costs are covered by the employing organization.

Furthermore, FLR, SNS and MEM provide funds for education, equipment and development: 15 mln DKr per year for 250 NI guides comes from central funds, the rest is paid by organizations themselves.

The total cost of NI service amounts to DKK 60 mln per year. Ca. 45 % funds are local. This demonstrates the success of "being local" in contrast with the Green Guide Scheme, which is dying out due to cut of central funding.

Nature schools are usually build by municipalities and run by SNS. "Due to different funding sources it is much easier to open a nature school, than to run it with maximum utility. Salary of nature school leader is paid by a different organization, than a municipality that owns a school, - by SNS" ¹⁴. For this reason some schools stand idle for many hours a week (afternoons, weekends), and some even for some working days, if a nature school leader is employed only part time.

2. Nature Interpretation Services

¹⁴ from the report by Per Mikkelsen at the Nordic-Baltic Seminar on Nature Schools and Environmental Education in Estonia, August 2003

Nature interpretation offers a range of services for everyone interested in learning more about nature, relation between nature and culture, and environmental condition of nature.

NI methods at all group levels imply active practical involvement of participants and thereby give an opportunity of learning with all senses in the real world of nature, both in urban and rural areas.

2.1. Nature interpreters and activities

About 250 nature interpreters - naturvejleder in Danish - "work in the forest districts, in the counties, in the municipalities, at nature schools, in museums and in outdoor life organisations"¹⁵. They organise tours and activities for various age groups which everyone can join. Most common target group is families with children, followed by children, followed by adults, and even foreign tourists in rare cases.

Booking a tour for a group takes can be made by telephoning the closest nature interpreter or an interpreter who works in the area of interest.

Guides are open to clients' specific interests, as well as able to offer a few prepared activities to choose from.

"Many counties publish folders with survey of all the public trips and arrangements that take place within the borders of the county.[...] Furthermore, a number of forest districts, municipalities, museums and organizations distribute folders with their own arrangements"¹⁶. Some of the counties have placed information about their nature interpretation arrangements on their web.

The folders are available at tourist offices and libraries free of charge.

Often an arrangement is advertised in a local newspaper with a short introduction and conditions.

¹⁵ Skov- og Naturstyrelsen, *Nature Guidance in Denmark*, <http://www.sns.dk/internat/guidance.htm>, retrieved on 24-05-2004

¹⁶ Skov- og Naturstyrelsen, *Nature Guidance in Denmark*, <http://www.sns.dk/internat/guidance.htm>, retrieved on 24-05-2004

Forest administration

13% of Denmark is covered by forest. 1/3 of the Danish forest is state owned and it is administered by SNS. It is divided into 21 State Forest Districts.

1/3 of the Danish forest is owned privately. 1/3 of the Danish forest is owned by companies.

Nature guides employed by SNS are attached to one of the state forest districts, where they perform their regular interpretation activities. However, a nature interpreter can be invited to guide a tour in another forest district.

There are nature schools in private forests as well.

A nature interpreter guides where and how to experience nature closely, and explains historical and cultural background of a particular area or a landscape.

2.2. Training and assistance from nature schools for teachers

Teachers who are interested in supplementing classroom work with experiences in the nature for children are offered training courses at nature schools. Furthermore, teachers are offered professional assistance and guidance from nature interpreters in arranging educational activities in the nature.

2.3. Activities for children at nature schools

Primary and lower secondary school.

Nature school can well supplement training in many disciplines. These are disciplines which would benefit from experimenting and examining activities in the nature, such as history, chemistry, mathematics, woodwork, domestic science, drawing and nature & technique (which contains biology, geography and physics).¹⁷

¹⁷ Skov- og Natstyrelsen, *The Nature School and Primary and Lower Secondary School in Denmark*, <http://www.sns.dk/internat/natsch.htm>, retrieved on 24-05-2004

"The training at the nature school is based on using nature as a classroom. Here a training form, which combines experience in nature with activities, proficiency and knowledge, is developed"¹⁸

The new Primary Education Act (year) has put more emphasis on integration of training in nature into subject training at school. As a result children are expected to achieve better results in the disciplines concerned, as well as to understand relation between man and nature and obtain practical skills of behavior in nature.

Training outside physical frames of school is supposed to increase. It will be taking place both at nature schools and in natural areas nearby the home school, outside and inside the city boundaries.

It is the responsibility of school teachers to implement integration of nature activities into school routine, while they receive support from nature schools and nature interpreters.

Types of activities.

At a nature school pupils get involved in a spectrum of professional activities, which relate to nature, culture, history and environmental issues, such as bird watching, recreating a stone age man's meal, looking for signs of wild animals, looking for signs of spring, etc. Another kind of activities is outdoor life oriented, such as fishing, orientation in the forest, tree climbing, cycling tour, etc.

"Through authentic experience the pupils hopefully develop an increased thoughtfulness and sense of responsibility towards nature, environment and culture history"¹⁹.

On average, varying from municipality to municipality, nature schools are well equipped to accommodate various indoor and outdoor activities. Usually nature schools are free to use for schools and day care institutions from the same municipality, while institutions from other municipality have to pay.

Nature school is an excellent supplementary asset for schools in connection with the "subject-weeks". On the other hand, a special arrangement practiced at nature school called "topic day" can be a useful illustration to one or another discipline.

¹⁸ Skov- og Natustyrelsen, *The Nature School and Primary and Lower Secondary School in Denmark*, <http://www.sns.dk/internat/natsch.htm>, retrieved on 24-05-2004

¹⁹ Skov- og Natustyrelsen, *The Nature School and Primary and Lower Secondary School in Denmark*, <http://www.sns.dk/internat/natsch.htm>, retrieved on 24-05-2004

2.4. Education of Nature Interpreters

Since the beginning of the experiment in 1987 Nature Interpretation has become a profession in Denmark. The Nature and Forest Agency provides a two year education, which gives the graduates the right to perform NI. The course runs in seven weeks during two years, when nature interpreters do various practical exercises and small projects.

Denmark is considered the most advanced country in the field of nature interpretation and nature schooling. For example, it has got an established education system for nature interpretation. Initially it was provided along with employment at the Forest and Nature Counsel. Now it is also open to everyone at the Forestry college, but with a high tuition fee. Even though this profession is popular in Denmark it is hard to get enough students willing to pay a high fee in the current "environmental" crisis of governmental policies.²⁰

Nature interpreters are educated in many ways the same way as they themselves work with a group. They get a chance to be a "participant" and a "guide", and reflect on their experience on both sides. The main method of education is practical creativity: trying out new activities, reflecting upon them, and trying again with corrections. Learning by doing. This is what a nature interpreter is expected to do: to create, to test, and create again. Reflection is essential to dynamic development and enhancement of the quality of nature interpretation.

The Danish Forestry College has also introduced a course in NI.

Most common group of professionals that join nature interpretation are biologists and foresters, others are archeologists, culture historians, geologists, professionals in agriculture, and teachers.

2.5. Visit to a Nature School

Sessions at a nature school are scheduled in morning time typically starting at 9.00 in the morning and lasting 2-4 hours. If the activities have to be carried out in the evening or early in the morning, a class might have to stay overnight at a nature school.

A longer visit is usually more effective and memorable, as it gives a chance for more experiences.

Frequent visits to a nature school help pupils to remember their previous visit and relate to earlier experience. They become more confident about a nature school, its staff, its equipment

²⁰ from the report by Per Mikkelsen at the Nordic-Baltic Seminar on Nature Schools and Environmental Education in Estonia, August 2003

and surroundings. Regrettably, majority of nature schools do not have a capacity to accommodate one class more than once a year.

Activities at nature schools are carried out through out the academic year. The variety of offers in spring and autumn are numerous, when nature is most 'active'. In winter season, special arrangements are carried out.

2.6. Courses at a Nature School

Preliminary agreement between a teacher and a nature interpreter is important for successful implementation of a course. Every nature interpreter works in his/her own way, there are no standards for nature school training. It is up to a teacher and a nature interpreter what they agree to do at a nature school session.

If the weather is good enough for outings, very little time is spent in a class room of a nature school. Upon arrival to a nature school children are given some time to look around and calm down. During the first quarter of an hour they usually examine stuffed animals, fish in aquariums and even live canary birds in cages that are typically present in almost every nature school. Even though children are suppose to have been prepared for the theme of a course, a nature interpreter gives an introduction to what is the subject of the day, what are they going to do and what tools they are going to use.

Sometimes an expanded introduction in terms of discussion with children is required or recommended, which also includes revision of pupils' knowledge on the subject. An interactive discussion-consultation in the beginning of the session will help pupils to keep up their concentration. "It is of great importance to the output of the pupils that they get time to concentrate, that they get unexpected experience and freedom to be in nature and use their senses. It requires an open organisation that in relation to the commitment of the pupils is working in the best cases".²¹

However, a discussion about tasks and activities can take place in the middle of a course. A discussion about collected material and examinations usually rounds off a day.

Resuming discussion with professional and social references is necessary to identify children's experiences. Resuming discussion can be very rewarding for children, as every material found in the forest is a success story, and every question and every answer are

²¹ Skov- og Natustyrelsen, *The Nature School and Primary and Lower Secondary School in Denmark*, <http://www.sns.dk/internat/natsch.htm>, retrieved on 24-05-2004

appreciated. Alternatively, if a topic is not closed, a follow up discussion takes place in a home school whether by a teacher or by a nature interpreter himself.

2.7. Nature School Management

A nature school is managed by a user counsel, which consists of a few school directors and school teachers, and a nature school leader (naturskole leder). They hold regular meetings about the condition of a nature school, and the counsel's main function is to secure successful and purposeful exploitation of a nature school. Matters, such as financial circumstances and employment are decided, as well as professional and educational issues. Based on a feed-back from a user counsel's representatives, the counsel develops new activities for children and training courses for teachers. The latter gives teachers an opportunity to learn about nature school's activities, and to organise activities with children independently in other places.

3. Links to Public Schools

Nature schools advertise a number of events, training courses and other activities in their web site and in brochures and catalogues. They also inform teachers through information meetings, user counsels, news letters and training courses.

The training propositions are among others "based on a professional subject, field biological activities, outdoor activities, work shop activities, sense experience".²²

As natural surroundings of nature schools and personal interests of nature interpreters differ, and so do the activities on offer from every nature school and every nature interpreter.

A teacher and nature interpreter may agree on an arrangement that may differ from an offer in a catalogue. In this case both the teacher and the nature interpreter are responsible for the success of the undertaking.

Teachers may also use catalogues as inspiration for activities they would organise by themselves.

For the best outcome of the training session at a nature school, it is important that teachers take an interest and actively participate in the process. "The professional output of a visit at a nature school becomes most successful when the visit is integrated in the daily training of the

²² Skov- og Natustyrelsen, *The Nature School and Primary and Lower Secondary School in Denmark*, <http://www.sns.dk/internat/natsch.htm>, retrieved on 24-05-2004

class, and when it is a part of an extended training course. The training at the nature school can either be used as an introduction to a training course, as a break in the middle of a course, or as a conclusion."²³

Experience shows, that preliminary discussion or introduction into the theme of the visit to a nature school, makes children more motivated, concentrated and receptive during the training. To insure the best professional output, it is essential that teachers deal with the experience children got at a nature school by integrating it into a daily training and, perhaps, by carrying out a follow up session, when pupils identify their experiences and reflect upon them.

To improve efficiency of nature schools, a new networking project is being realized. The symbolic idea is similar to the "spider net", where a nature school collects information from public school teachers about their favourite outing spots where they take their classes to, and then will offer the teachers assistance in organising and implementing nature outings in the best possible way in terms of positive experiences in the nature. A nature school will also spread information about the nature spots where some school teachers take their classes to all the other public schools in the region. The project is funded by the Danish Outdoor Counsel.²⁴

4. Development of Methods

When nature interpretation experiment began in Denmark in 1987, it was done in the same classic fashion as in USA, where the inspiration came from. Very soon, however, realization emerged that classic tours where a guide gives a lecture in nature, provide information to public, but do little to encourage personal involvement in environmental issues. " A series of nature interpretation activities and alternative interpretation methods were developed in the late 1980s in order to get people to take an active part" (Naturvejleder, Dec.2002, A.B. Andersen, p.7). Nature interpretation has been well adapted to the Danish cultural and democratic traditions.

During the 17 years of operation the Danish nature interpretation service has developed from guided tours to a tool for sustainable development.

²³ Skov- og Natustyrelsen, *The Nature School and Primary and Lower Secondary School in Denmark*, <http://www.sns.dk/internat/natsch.htm>, retrieved on 24-05-2004

²⁴ from the report by Per Mikkelsen at the Nordic-Baltic Seminar on Nature Schools and Environmental Education in Estonia, August 2003

Danish nature interpreters characterize nature interpretation as a pedagogical method itself, a method where experience is the central element (Naturvejleder, M.A. Knudsen, p. 8). " It is especially the direct experience, which is a trademark for the nature interpreter. The classical guided tour with an expert, who holds a lecture in the countryside, has been replaced by a communication with the participants, which encourages them to play an active part in the instruction. When we use all our senses, dip our fingers in the stream water or in the forests floor's mossy carpet, feel the spider wriggle, taste the plants of the meadow; then we will remember the experience and the good stories. From this develops an understanding, an opinion, and the desire and possibility for action" (ibid).

The Brundtland Report²⁵ in 1987 and Agenda 21²⁶ in 1992 have emphasized the importance and brought to the top agenda active involvement of minds in taking responsibility for the natural environment.

5. The Aim of the Danish Nature Interpretation Service And Sustainable Development

"The aim of nature interpretation in Denmark, as defined in 1985, was to describe and explain the characteristic elements and structures within a landscape or an area as a whole "²⁷. Denmark is a small and quite densely populated country, almost the entire territory of Denmark has been whether cultivated for agriculture or influenced by man in one or another way. It is common knowledge that Denmark lost its forest already 200 years ago to fleet building. As a result, there are no wilderness areas left in Denmark, and all its landscapes bear a sign of human activities to some degree. The variety of Danish landscape is characterized as whether "cultural", where man has purposefully cultivated, used, changed or recreated natural resources, or "semi-cultural", where the nature has been effected and changed by human activity indirectly.

Nature interpretation in Denmark focuses on the variety in the landscape, and the cultural history behind it.

²⁵ WCED (1987). *Our Common Future*, Oxford: Oxford University Press.

²⁶ United Nations (1993). *Agenda 21: The United Nations Programme of Action from Rio*, New York: United Nations Publications.

²⁷ A.B. Andersen, NATURvejleder, Dec. 2002: Nature interpretation in Denmark, p. 6

Agenda 21

Initially the aim of nature interpretation was to make people interested in their environment by providing them with interesting experience in nature. Interest and concern was supposed to be the path to sustainable development.

After the Brundtland report has brought Sustainable Development into international political agenda, and UN conference on Sustainable Development in Rio-de-Janeiro in 1992 has come up with the action program called Agenda 21, the aims of the Danish nature interpretation have been adjusted accordingly.

The slogan of Agenda 21 "Think globally - act locally" was incorporated into nature interpretation guidelines. Local landscape characteristics became linked with the global environmental issues. Local environment was explained in the context of the global environment. Explanation of how man and nature interact and how this interaction influences social decisions and the way of human life has started to play a bigger role in nature interpretation.

Sustainable Development.

It has always been difficult to encourage general public's concern about the environment. In order to attract participation in nature interpretation, traditional titles and contents of tours have been maintained, while discussion about local and environmental problem was brought up where possible and appropriate.

Nature interpretation in Denmark has started as guided tours 17 years ago, and has been developing dynamically ever since. Danish cultural and democratic traditions became an integral part of the contents and methods applied. Active participation in the local environment brought into the global context and scale have the potential of developing nature interpretation into a tool for sustainable development, which is, in fact, its ultimate goal.

6. Conclusions

The chapter demonstrates that nature interpretation and nature schools in Denmark have been successfully developing in the course of the last two decades. There seemed to be no shortage of enthusiasm and initiatives among nature interpreters and nature school leaders. The set up

and infrastructure is there to be used by general public and public schools. Nature schools, in particular, make special offers to public schools in terms of, for example, educational courses for teachers, or special sessions and tours adapted to a specific public school and its surroundings. The conclusion to this chapter is that there seems to be enough initiative, willingness and action from nature schools to promote and expand co-operation with public schools.

Chapter 4. Theoretical Framework

1. Introduction

The subject of our research, namely NI for children, involves a vast theoretical background, which includes, theories of knowledge, of culture, of ecology, of learning and teaching. We attempt to cover the main relevant theoretical approaches to the research area, in order to make our argument well grounded and coherent.

The way to approach relevant theories is to provide a comprehensive overview of the state-of-the-art developments of the normative, pedagogical, and political strategies of EE. Review of the literature on the latest research in EE helps to detect a certain pattern in developments of EE.

According to Palmer (Thompson, p.4), EE first appeared as a part of school curriculum subjects, it was integrated within the subjects, and it was merely information *about* nature and environmental problems.

Developments in the philosophy, policies, and practice of EE have led to gradual transformation in the paradigm of environmental pedagogy. Teaching *about* nature, dominant in the early 1970s, grew into teaching through experience, field work, and values in the 1980s, which in turn transformed into teaching of action research and student-led problem-solving fieldwork in the 1990s' (ibid). Palmer argues that EE develops in the right direction, but still has too narrow perspective, where it treats environmental crisis of the Earth as a sequence of separate scientific issues, while excluding social, economic, and political concerns (ibid). The given perspective is rooted in scientific approach and has a focus on communicating information *about* the environmental problem.

According to Palmer's research recent studies in EE look for identification and control of the factors critical to shaping pro-environmental behaviour.

Another direction of research focuses 'on the acquisition and development of environmental knowledge' (ibid, p.5). Palmer illustrates that school children often have knowledge of environmental issues, but are unable to relate it to other environmental, not mention, scientific or social, issues. This direction of research is looking for new teaching strategies that would

shape a comprehensive view of the natural world, its interrelated issues, and would untangle confusion of conceptions in pupils' minds.

2. The Three Kinds of EE

In the traditional EE model, science disciplines such as geography, geology, chemistry, physics, and biology constitute knowledge about the environment, or provide conceptual capacity for acquiring such knowledge. There is more, however, to environmental education, than communicating scientific facts.

Palmer comes up with a three-fold formula to embrace the all possible methods at various stages of EE process. It entails wider interpretation of environmental condition and problems - *education about the environment*, experiential fieldwork in the environment, referred to by Palmer as *education in the environment*, and shaping active participation and caretaker ethic - *education for the environment and on behalf of the environment* (ibid, p. 7).

Education *about* and *in* the environment is predominant in the present educational practice worldwide. A few attempts to bring about education *for* the environment have been made in Europe and USA and have received a lot of international interest, such as QUARK (Kofoed et al, 1994) project, which was carried out in four Danish municipalities. The idea of this project is "to increase cooperation between schools and the local community with reference to solving locally based environmental problems" (Bruun et al, 1995). The project takes up local environmental challenges and "tries to combine educational innovation with local technical and societal change", - an instrumental approach in EE for the environment (ibid).

Palmer illustrates and argues that a successful EE planning model expands of the threefold framework' mentioned above. "Within this framework, three elements are crucial: personal *experience* in the environment, the development of personal *concern* for the environment, and the taking of personal *action* on behalf of the environment" (ibid).

Thus, as mentioned above, development of philosophy, policy and practice of EE has led to a new normative approach, which has focus on the experiential learning *in* and *for* the environment. Review of literature on EE research has shown that this direction of strategic development is not an isolated event within diverse trends; it is actually a common normative approach in EE, and on our opinion, a rather logical one (Breiting 1993, Ahlberg & Filho 1998, Thompson 1997, Mrazek 1993). EE was initially an introduction to selected facts of

environmental crisis. The need for practical solutions and shaping of active pro-environmental attitude has called for alternative strategies, which would allow such changes to take place.

Below we introduce theories that provide conceptual context for the EE today, as well as for our research.

3. Classification of Relationship Between Man and Nature

One way of classifying different theories about relationship between man and nature is to sort them into anthropocentric, biocentric, and ecocentric, as Britta Carlsson does in her doctoral thesis about ecological understanding (Carlsson, p.29).

”According to anthropocentric view, nature is given a value because it is beneficial to man” (ibid). Because of his conscious mind, man is given the right to dominate nature, he is separated from it, and he is superior to it. This is a view that obviously dominates the Western societies today.

In the biocentric view nature has intrinsic value. All living beings have equal rights. However, since it is man who assigns these rights, his position is outstanding, and his relationship with other species is not symmetrical. Being *Homo sapiens*, in other words - an intelligent being, he carries moral responsibility for other species. ”The human is not presiding over and above, but *within* nature” (Carlsson, p.30).

In the ecocentric view expressed by Arne Naess, the Norwegian founder of the deep ecology movement (Naess & Rothenberg, 1995, cited in Carlsson), all beings live in one common system, which could be compared to a super-organism. They are integral parts of the system; the survival of the system and of individual species and beings depends on the wellbeing of the other species and beings. Similarly to the biocentric view, all beings have the same importance, but here they are also interdependent. ”Species are valued from the viewpoint of how they serve the survival of the system as a whole, not simply their own survival”(ibid). Man’s survival is not superior to survival of other species.

”The key aspect of the Western view of nature - understood as rationalistic and instrumental, i.e. anthropocentric - is that nature is discontinuous, or ontologically divided, from the human sphere, which leads to a view of humans as apart from nature” (ibid, p.32). The dualism of man and nature is seen in the context of a number of set dualisms, such as dualism of mind and body, masculine and feminine, reason and emotion (ibid). In contrast with this dualistic view, deep ecology advocates an idea of indistinguishable expanded self, according to which

an individual identity of an ecosystem member is extended to the identity of the whole system. Individual members are inseparable from the entire system, and thereby their interests cannot be distinguished separately from the interests of the other members, or the system itself.

This indistinguishability conflicts with the classical idea of analysability of the world into separate parts. Thus, a relational man/nature account has been called for (Plumwood, 1995, cited in Carlsson). It compromises anthropocentrism and the dualism of man/nature by emphasising that the human interests are not indistinguishable from, but interdependent upon the surrounding world.

4. Culture and Ecology

Deep ecology is one of the strongest pro-environmental philosophies. It is not only radical *green*, but also fundamental to environmentalist movement and to shaping environmental consciousness and attitudinal change. The following selection of quotes illustrates the hard core of deep ecology and its approach to EE.

“For us, ecological education connotes an emphasis on the inescapable embeddedness of human beings in natural systems”(Smith & Williams, p.3). Rather than a manipulatable set of recourses, nature is seen as a system, which a man is part of, and human cultures are regarded as ‘an outgrowth of the interactions between our species and particular places’ (ibid). Man and the Earth cannot be disentangled from each other.

“Stephen J. Gould (1991) has argued that human beings are unlikely to protect what they do not love, and that we cannot love what we do not know. Similarly, David Orr (1996)²⁸ suggests that the simple possession of data regarding resource depletion and pollution is no guarantee that people will make decisions favourable to other species and the planet”(ibid, p.7). On top of these factors, more and more human activities take place in artificially built environments, thus connection of humans to nature is being disrupted. It may seem that humans create their own environments different from natural systems where we all come from, and that they exist, and very well survive outside the natural systems, separately or even independently from nature. This is, of course, just a subtle illusion, easily destroyed by simple, but not always obvious facts about the origins of the resources we build our artificial

²⁸ Gould, Stephen Jay. (1991). Enchanted evening. *Natural History* (September), p.14

Orr, David. (1996). Reconnecting the pieces: Ecological design and education in the 21st century. Keynote address at the Ecological Education Institute, Lewis & Clark College, Portland, Oregon, August 21, 1996.)

environments from, about the resources that allow us to run these environments, and maintain the highly urbanised lifestyle.

Connection between man and nature, and the need to re-establish it is in the centre of the deep ecological problematique. The disrupted connection has to be re-established. Ecological education is one of the most important paths towards this goal.

In the holistic ecology approach 'man is a part of nature as a result of a united process, and he has his own role and ecological aims in this process - to be a biosphere's spiritual dimension'. "If we assume that nature is a generative process and source of our values, it is correct that values are multifaceted ideas with structures rooted in natural sources."(Ilga Salite, p. 202-203).

" A definite level of self consciousness and one's own connections with the world ecocentric understanding creates the situation when the individual loses the boundary between his "self" and the world. In this case A. Naess uses a concept of ecological self. Teachers and psychologists in this case speak about an exalted ecological culture or high ecological consciousness" (ibid, p.203).

" On the basis of this reflection we can say that the aim of ecological education is to revive man's deep various ties with the world, by changing present egoistic and antropocentric aims, purposes characteristic of a man, to overcome a narrow technocratic consuming attitude to the environment" (ibid, p. 203).

'Ecological values represent all that binds individual with the world in united whole' (ibid, p.205). " Values allow man to understand himself as one of the manifestations of the biosphere that has its own aim in its joint function" (ibid, p.205).

Ecological identity 'allows man to understand himself as one of the creations of the evolutionary processes of nature', the one, who possesses 'spiritual creative force' (ibid, p.211).

To conclude, deep ecology is a view of the world, where all beings are equal, and where the survival of the world is dependent on the survival of each being. However, being a product of man, it gives him a special identity: the spiritual one. This echoes with the biocentric view, where superiority of human intelligence above other species is recognised, and therefore man is held morally responsible for the other species. It is the interconnectedness of all beings, and of man to all beings, in particular, that grounds his moral responsibility. Without connection and interdependency of species, there is no moral responsibility for them.

5. Paradigm of Knowledge: Power & Control Or Empathy?

The kind of knowledge propagated by the Western world in its schools is based on the presumption that knowledge can only be obtained by separating observer from the observed object. Objectivity, as the criterion of science making, can be achieved only by taking a distance to the studied object. "In this sense then, the very act of knowing separates us all from nature and the things we come to know in nature"(Laura & Cotton, p.1). By separating ourselves from all things, we also separate us from each other, and thereby lose moral responsibility for exploiting all living and non-living things.

The Western world has selected a form of knowledge that serves to obtain and maintain power and control over so-called "forces of nature" and over other human beings. This "*particular form of knowledge*"²⁹ [...] has led directly to an environmental crisis of monumental terms" (ibid).

Western schools became "the state-sanctioned vehicles for the cultural transportation of an ideology of power and control"(ibid, p.3).

"To reconceptualize knowledge as the means to empathetic connectivity, rather than as the means to power, the role of education must be educate the sensibilities of moral consciousness to recognize *the value* and *the point*"³⁰ of moral responsibility [...]. The objective of the moral exercise is not 'in controlling' but 'in connecting' and it is upon this foundational principle that the edifice of environmental education can be built"(ibid, p.163).

Conventional way of knowing encourages learners to detach themselves from objects of their study, from nature, and thereby rationally manipulate and consume it. 'Transformative subjugation' of the 'forces of nature', which have intrinsic value, technologically converts them into forms of diminished value.

If the concept of educational knowledge is motivated by belief in connecting with nature as the ultimate way to security within nature, the methodology of education will reflect the participatory approach to the environment. The transition within epistemology will reflect transition of the measure of knowledge from how well we know how to control it to how well we know how to connect with it. A battle against nature can turn into partnership with it.

"It is the empathetic ecological approach [...] which seeks to put us back into the skin of nature and teach us how to be there responsibly. When knowledge is motivated by empathy, it

²⁹ Italics by Laura & Cotton

³⁰ Italics by Laura & Cotton

generates connectivity and the associated mode of thinking we call ‘participatory consciousness’ which assists in helping to reconceptualize our epistemological value orientation in a way that reconnects us with nature”(ibid, p. 167).

A shift towards an ecological paradigm does not simply mean more environmental education. It implies realization that the education system in practice promotes “structured misinterpretation of reality, nature and human nature”(ibid, p.168). The belief that that true objective knowledge can be obtained through detachment by means of so-called ‘alienated consciousness’ has led us to alienation from each other, from nature, and from ourselves.

Environmental education embedded in the epistemic paradigm of conventional education will “simply reproduce, albeit in admirably cosmetic ways, the same contexts of technological invasiveness and intrusion that warrant extirpation from the school curriculum”(ibid, p.171).

“Empathetic ecology, as we envisage it, recognizes that the recourses of nature belong to nature and not to us.... Once we introduce the concept of borrowing the recourses of nature, the appropriate moral disposition of *gratitude*³¹ for that which is borrowed follows naturally”(ibid, p.172). Acknowledging this concept means that we owe our being to the many living and non-living things in the nature.

Summary

Epistemic paradigm of conventional education encourages the Western utilitarian attitude of power and control towards nature. In order for EE to be able to break down this pattern and bring about attitudinal change, notion of empathetic ecology needs to be integrated into the conceptual framework and approaches of EE. This would then mean that in order to establish ‘connectivity’ with nature and bring up ‘participatory consciousness’ preached by empathetic ecologists, a practical way of teaching *about* and *in* the nature has to be applied. Conclusion with experiential phenomenological method of teaching, which would enable following the goal of re-connection with nature, completes the speculative circle of the discussion about empathetic education and its relation to normative experiential learning.

Following the line of empathetic/ecological education we take the discussion back to the origins of nature interpretation - the so-called *heritage interpretation* by Tilden as it is presented in chapter 2.

³¹ Italics by Laura & Cotton

6. Heritage Interpretation and Ecology

As stated in the principles of Interpretation³², it is not an 'instruction, but provocation', it is not information, but revelation, finally, it is an artistic performance by an interpreter, where he connects his visitors with the nature, and thereby creates a state of common identity between a

visitor and a heritage site (Tilden, p.9). By these definitions, we can not call it an explicit education, but it qualifies to being education by it's aim of guiding a visitor to a new discoveries

within himself and the observed site, helping to reveal new identities and connections with the world.

Human need to identify with a group, certain individuals, with cultural and aesthetical values makes a great resource for Interpretation. By addressing individual group interests, an interpreter can create association with a subject of interpretation, and thereby call for personal involvement. This principle of extended identity falls together with the undistinguishable empathetic self in the ecological perspective.

Tilden propagates holistic approach in delivering an interpretation story, where spiritual and artistic dimensions are above factual and analytical. The spiritual whole of the subject of Interpretation is in the focus, what echoes with the role of man as spiritual dimension of the world in the deep ecological perspective. It is a presentation of a whole of a subject, rather than its parts, and a visitor is addressed as a whole man with his different qualities and interests. This approach gives space for and inspires personal associations and involvement, and thereby leads to the state of common identity of man and nature/world. It is an idealistic and radical view of two wholes that fall together, or of a whole man falling into a whole nature/ecosystem.

True interpretation aims at creating consciousness, that man and nature are inseparable, and that by vandalizing nature or any beautiful thing, be it natural or man made, man vandalizes himself. This position seems to echo with the deep ecological.

³² See Chapter 2

Is this understanding enough to cause attitudinal change and shape pro-environmental behaviour? Is empathetic ecological education and NI enough to lead us to a sustainable nature management?

In an attempt to answer these questions, we call for an additional challenge of discussing ecological perspective in EE and NI in combination with instrumental and cognitive approach, which dominates EE research in Denmark and has a strong impact on educational practice in the Danish public schools.

7. Action Competence Approach

”Environmental problems are constructed of conflicted human interests in relation to nature” (Schnack, p.83).

We relate to the perception of some of the central philosophical points and the paradigm of the concept of environmental education expressed by Karsten Schnak on behalf of The Royal Danish School of Educational Studies (Schnack, 1998).

Conflicts

Nature becomes environment, and oil, coal and flint become resources because they are viewed through human interests. Eutrophication becomes pollution because we do not want it. “Pollution is [...] a normative concept”. ‘Environmental debates are normative, value-laden discussions’ (ibid, p.84).

“Environmental problems are thus not problems in nature or between humans and nature. They are societal and cultural issues and they are made up of conflicts between different and incompatible wishes about the use of nature”(ibid).

Sustainable Development

The concept is defined in “Our Common Future”: ”Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”(WCED, 1987).

Since human needs change through out history and cultural development, it is not possible for us to determine the need of the future generations, and therefore not possible to safeguard their ability to meet their needs. Fulfilling present needs not only changes the surrounding environment but also changes the future human needs.

Thus the ability of future generations to meet their needs becomes an illusive concept grounded in pure speculations. We know, that life conditions and needs of the future generations will be different from ours. Thus, the best we can do for their future is to teach our children to adapt to quickly changing environment, to compromise their needs with the given environmental needs (Jensen & Schnack, p.84).

“Sustainable development is not, any more than is peace - or democracy - a condition or a settlement, but, on the contrary, it is a utopia that exists in opposition to violence” (ibid,p. 85).

Action competence

The concept of conflicting interests is in the centre of the curriculum of environmental education. It provides context for political education for citizenship. This kind of political education has been called *Action Competence* in Denmark for several years. This educational concept was created in contradiction to the behavioural modification approach common in public formal education. It was common to target pupils’ behaviour and to influence and shape specific habits and individual lifestyle. For example, in relation to consumption of water and energy, to disposal of waste, etc. Action competence philosophy speaks for much more ‘active’ and ‘competent’ participation, which goes beyond mere ability and mere behaviour. “It is qualified behaviour. First and foremost it is, by definition, qualified by being intentional” (ibid, p.89).

Discussion of the concept of Action Competence has been taking place in international educational spheres for the last two decades (Jensen & Schnack, p5.). Review of literature on research in EE has shown that AC is a dominant approach in EE in Denmark and it is a central pedagogical research area of the Research Centre for Environmental and Health Education at the Royal Danish School of Educational Studies. However, we have not been able to find information about practical implementation of AC in public schools, and integration of this strategy into didactics and curriculum. A few experimental projects, such as QUARK, have been implemented in few municipalities and in few schools. But literature about these projects does not reflect the common educational practice.

We will base our AC discussion on the action research literature and empirical observations from nature schools.

“Competence’ is associated with being able - and willing - to be a qualified participant. And ‘action’ should be interpreted in relation to the whole complex of distinctions concerning

behaviour, activities, movement, habits - and, then, actions”(ibid, p.7). Action is characterised as intentional, and it targets motives and reasons rather than mechanisms and causes (ibid).

“ An awareness that moralizing, behaviour-modifying teaching never - or only very rarely - leads to the intended behavioural changes has established a new focus on ‘action ‘ in teaching” (ibid, p. 10).

“A growing criticism that schools give priority to the academic dimension at the expense of the more practical has led to increased attention being given to the “action oriented”(ibid).

“ And finally, criticism of the schools’ work with “as if” situations, devised for the occasion, has led to greater demands for authenticity and, thus, also for participation in the reality of society as part of teaching” (ibid)

There is a difference between behavioural change and action. “Before an action, there will always be a conscious making up of one’s mind - not necessarily the case with a behavioural change. The first element in the definition of action is, of course, exactly that one decides to do something oneself, whether it is a question of a change in behaviour or an attempt to influence the conditions of life” (ibid, p.11).

There is a strong tendency in environmental and health education - often as a reaction to rather academically oriented content of education - to include various practical, ‘action oriented’, activities in the teaching. These can be excursions to natural areas, sampling and investigations of certain elements of ecosystems, etc. These activities are without any doubt useful education, but, in order to qualify for action, ‘they must be addressed to solutions of the problem which is being worked with’ (ibid, p. 12).

“In other words, an action must be targeted towards solutions of the problem that is being worked with”(ibid), and not just to symptoms.

“In many ways the recent discussion has been seen as a progression of the discussion within pedagogical theory early in this century”(ibid, p.191)³³. It was a discussion about responsible citizenship with key words of work, education, learning, and self-activity. Then, some forty years later, pedagogic discourse focused on qualification and sociological imagination related to capacity to act in social settings. The discussion re-emerged in the recent years with the growing interdisciplinary concerns about environment and society. Theories of socialization and qualification from the former discussion are useful for expression of ‘individual and

³³ Knud Jensen, *Action Competence in Pedagogy*

collective responsibility for the progression of individual, societal, and environmental concern (ibid, p.191-2).

8. Environmental education and Aesthetics

Aesthetic aspect is important in EE, as it deals with our world view and self-perception.’ Imagination is in the heart of EE ‘, as it relates to our ability to understand both the visible and the implicit content of the environment, as well as its ethical and aesthetical value (ibid).

Action Competence approach has to be seen in a context of education for democracy, which means being educated, qualified and to be a participator. Active political position and competence are the instruments for solving societal and environmental problems. Giving pupils responsibility for changing their life conditions by involving them in social planning and decision-making creates motivation for learning and action.

Action Competence approaches EE from the cognitive and political side, which is interesting in comparison with the ecological groups. A man is not seen as a part of nature, but rather in anthropocentric perspective, is superior to nature, as he looks for instruments of changing the environment for better or worse. Environment, as in the well criticised by the deep ecologists Western epistemic paradigm, is seen as a set of resources at man’s disposal. There is an environmental problem, only if it deprives man of the taken for granted environmental conditions and resources. This approach does not reach to the essence essay called ”Knowing and Being”, pp.123-137 of the problem, seen by ecologists as disconnection of man from nature, and consequently from himself and other individuals.

However, technicality and instrumentalism of this approach are of course useful as such, and offer ‘technical support’ to empathetic ecological approach with its focus on tacit experience. Phenomenological learning creates knowledge on unconscious level with emotional and aesthetical values. Cognitive instrumental approach of Action Competence complements the phenomenological experience with cognitive understanding, and thus creates new knowledge that can be used and disseminated.

We would like to illustrate our discussion with examples of NI for children, where we try to isolate elements of both NI and AC, if any.

9. Empirical Observations

Among the few sessions at different nature schools, we chose two, which seem to illustrate the above discussion to some degree, and which are also very different from each other. The first example is rather cultural and artistic, based on the Nordic mythology and aiming at reviving pupils' connection with nature through nearly forgotten culture in the way their ancestors experienced and connected to nature.

The second example is strictly scientific; it is based on experiment and aims at scientific knowledge about nature. However, we must say, that even a strictly scientific experimenting in nature allows for marginal use of all pupils' senses while they are in the nature.

Tårnby Nature School

Naturvejleder: Johnny Krog

Theme: Nordic Christmas Mythology

Class: 3rd grade

Date: 27-11-03

School teachers: Peter Søndergaard, Marion Nielsen, Pilegårds skolen, Kastrup

Introduction

Johnny and myself, we took off the nature school at about 08.15 in the morning towards the farm, where the school rented a room for the session. We parked the car and walked back some hundreds of meters to meet the children who were on their way. Johnny used this time to introduce me to some of the myths he was going to tell to children.

The theme of the tour was *Christmas and Trolls*.

The idea behind this theme is to re-animate the Danish culture and traditions that have been almost forgotten through the last three generations.

Myths of the tour

The myth about the origins of trolls and creation.

There was God that lived in a space where was nothing, no Earth, no light. He had many sons. His sons got angry with Him, and they cut off His head. It became the Earth. His hair became woods and bushes. They buried his body. After some time they felt sorry for their father, and ungraved his body. The worms that lived in it became trolls (småfolk).

There are many kinds of trolls depending where they live: forest trolls, farm trolls, swamp trolls or elves, etc. They are not dangerous; unless a man steps on them or does something to make them angry, for example, cheat them. It was very important to live in peace with trolls, because trolls helped a man to manage his life, especially farm trolls.

Every village had a troll idol - a wooden figure of a troll. They sacrificed butter, the most precious product they had, by putting it all over the idol's face.

Myth on how boys cheated a farm troll.

Every night a farmer had to feed a troll with porridge (grød) that had butter on. It was his son's duty. One night the farmer's son decided to make fun of the troll. Instead of putting butter on top of the porridge, he put it under the porridge, in the bottom of the plate.

When the troll saw the plate, he became angry, as there was no butter on the porridge. He took a big piece of wood and killed farmer's cow by hitting it on its head. Still, the troll had to eat something, and he took the porridge. When he finished it, he saw the butter in the bottom of the plate. He felt very sorry and upset for killing the cow. Then he took exactly the same cow from the neighbour and replaced it with the cow he just killed. In the end his farmer did not know anything.

The moral of this story is that playing with a troll may have consequences. One must treat them carefully and respectfully.

Myth about elves.

Elves are female trolls that live in swamps. They dance during nights. A young man should be very careful walking around swamps in the night. If he sees elves dancing, it is very difficult for him not to join them in the dance, and not to fall in love with them. If he joins them, he becomes fascinated, and dances until dawn. He is very tired the whole day after that, and in the night he comes back to elves and dances with them again. It goes on until the young man dies.

Elves can be recognised by a hole in their back.

Myth about mountain trolls.

Hill trolls live in hills, and they produce weapons for Gods. It can be dangerous for a young woman to come close to a hill, because she might see a very handsome young man. She then becomes fascinated and follows him into the hill. A girl then can become pregnant, and she is called *bjergtaget*. Her child is then considered half a troll.

Myth about how trolls steal babies.

Sometimes trolls steal babies before they get baptised. They are usually very "difficult" babies that cry all the time. To protect children from kidnapping, a metal pin is attached to their shirt, because trolls are afraid of metal.

Christian myth about origins of trolls.

Eve and Adam did not obey the God, they had many children. When God was coming to see them in Paradise, they tried to hide their children in forests, but could not hide all of them. Those that were not hidden were expelled from Paradise together with Eve and Adam. Those that were hidden in forests became trolls.

Tour

We met the children on a forest path.

In the beginning of the tour Johnny asked the children if they knew who trolls were. They knew.

He told them about kidnapping and gave everyone a metal pin.

The first sign of trolls we came across was pieces of a broken branch covered with moss. Troll must have been scratching his back with it. When he threw it away, it broke into pieces, and it still has his hair on it (the moss).

There were a few trees with some liana-like plant growing on them. They looked like long human hair. Johnny said it must have been hair of some female troll (the character to be specified) that was combing it.

Then we walked to a few spots, which Johnny associated with a certain myth. On the way from one place to another he was looking for different signs of trolls and explaining them to children. He also draws their attention to many other objects, such as leaves, plants, mushrooms, etc. Some things were found by the children themselves. For example, a frog in a ditch. Then Johnny told them a story of the frog. It could have been a fascinated princess. So he kissed the frog. Since nothing happened, we realized it was just an ordinary frog. He admitted afterwards that the frog was not planned, but since children found it just before he was going to tell about mountain trolls and were very excited by this find, he had to talk about it a little in order to satisfy their curiosity and let them release their excitement.

We stopped at a small hill, where Johnny told about mountain trolls. While telling the story he pointed at a boy that stood in front of him, and said that a mountain troll can look as handsome as that boy, therefore girls have to be conscious not to fall in love and follow such a young man appearing from a mountain slope.

Children were captivated enough by the story. Yet, example of Thais, made them even more involved, they were laughing. Thais seemed to be both flattered and shy.

We stopped at a pit surrounded by a few trees at a glade. There was no water in it, and it looked like it could have been a swamp (the forest was planted about two centuries ago when Vestamager was turned into land, the forest looks rather natural, but pits like this can be explained by human intervention). It was time and place to take a short sandwich break; there were a few wooden tables and benches on the glade. Johnny told about dancing elves. Again he emphasised how careful boys have to be should they happen to walk in a swampy forest in the dark. He also pointed at a girl suggesting that elves could be as beautiful as her. That girl was new in the class, but the reason I was told about her by her teacher, is that she was so confident that she would be the first participant in everything the class was doing. The teacher had to call her name too often to tell her to give space to other pupils. For example, she was always next to Johnny, asking questions, etc. When Johnny pointed at her as an elf, she was neither shy nor flattered, she took it rather calmly.

Children were rather free to move around. They were supervised to some extent, as there were three schoolteachers, three nature school staff members, and myself with them. They were very interested in the tour and in Johnny as he is a fantastic and captivating storyteller. I was close to start to believe in trolls myself. Despite of their age (9-10 years old) some children believed in the myths.

When we walked from one story spot to another, children were rather free and scattered. They played with each other; they were looking and finding interesting objects in the forest. When Johnny found a mushroom or another interesting thing, he would tell about to the children who were close to him at the time. When he arrived at the story spot, he stood still waiting for children to gather around him and start listening. They usually did so without extra control.

After having seen all the places where trolls lived, we came to the farm, in order to eat the traditional Christmas rice porridge (*risegrød*) and to hear more about Christmas traditions.

A few items of the trolls' clothing were found as we approached the farm: first a small red woollen sock, then a scarf, and then a cap. Modern trolls dress in red as Christmas approaches. Farm trolls are called *nisser* (dwarfs) who are traditional Christmas characters, similar to Santa Claus. *Nisser* are farm trolls, but their name changed with time as well as their clothing, they dressed in grey before the red colour took over.

It was a stable with piles of heating wood in it. A corner was furnished with large hay bricks, and had a wooden table and benches in it. There was a troll in the fireplace, and he prepared the rice porridge. Johnny told the story about the troll who was cheated and killed a cow. Suddenly children saw a wooden shoe (*træsko*) on top of the heat wood. Supposedly it belonged to a troll.

Having eaten the delicious rice porridge, we packed up and let the children play freely in the nearby bushes. They were extremely happy and active running after each other and hiding in bushes.

Johnny walked them to the bus stop.

Theoretical comments

This session was done very much in the spirit of Interpretation by Tilden. Culture and nature were united in the landscape. Spiritual dimension in terms of mythology originated from the nature and gave cosmological meaning to it. The myths connected the children to the subjects of interpretation, they were interested and involved, probably, due to their personal associations triggered by Johnny's stories.

Having been at the tour myself, I recall being very interested in what Johnny had to say, involved and curious to discover realities of *trollihood* (italics by Fuks). It felt like he was going to tell a secret, reveal a mystery. Yet, he was not an exclusive owner of that mysterious knowledge. Many of us knew about trolls. Johnny was just guiding us in their kingdom.

Trolls could be representing man in this cosmology, or they could be representing the relation of man and nature. Trolls are an inseparable equal part of this world. They live in harmony with the nature, and with man. Man has to respect trolls; otherwise they can get angry and punish the man. On one hand, trolls are a continuation of humans; on the other hand, for humans they are a part of the nature. These relations contain elements of deep ecological

ethics, namely, expanded and undistinguishable self. Perhaps, ancient tribes that created this mythology did not distinguish themselves from the nature. It was their life world, their immediate environment, they lived in it and they depended totally upon it. Perhaps, trolls served as extension of their boundaries, which according to Polany is the tacit phenomenological knowledge of the world.

As deep ecology states, human cultures are space and time specific, they are product of nature, and so ecological values and cosmology are products of nature itself.

The Christmas tour had focus on culture-nature relation, and therefore there were no or little natural science.

Raadvad Nature School

Age: 5th grade
Theme: Soil
Nature Interpreter: Karen Vesterager
Schoolteacher: Anni Blom, Nærum skole
Date: 25-09-03

All activities are about examining soil and learning about its conditions, components and life. Children will be told about different aspects of soil, as well as will conduct and observe primitive lab experiments, such as on calcium content. They will scrub the upper layer of soil and examine it under a loop, etc.

The session can be divided into 3 parts:

- 1) classroom introduction to the theme
- 2) field work in the nearby forest/park
- 3) analysis and reflection on the soil examination

This class was going through a landscape theme when it had attended (1) soil analysis session and (2) aquarelle landscape painting sessions.

Their teacher of nature and technique has booked these sessions to match the theme at home school. Prior to the soil session the class went to a geology museum, and was given a lecture on landscape formation.

1. Karen has started by introduced different kinds of soil in a classroom.

She wrote this on a board with some help from the kids

- a) sand
- b) soil (jrd)

and the compounds of soil:

- a) dde planter (dead plants)
- b) affring (excrements)
- c) levende dyr + svampe (living animals and mushrooms)
- d) dde rdder (dead roots)
- e) dde dyr/skeletter (dead roots/skeljetons)
- f) levende rdde (living roots)
- g) sten/sand/ler (stone/sand/clay)

Then they discussed each kind of soil, its compounds, their qualities, origins, interaction and where they can be found. Both air and water is contained is soil.

Question: where is the most organic matter, in the upper or in the lower layers?

All organic matter is mixed together in soil.

Karen made a drawing of a hill to show what kind of soil is found on the top of the hill and what kind - down the hill. The drawing showed that the soil on the top of the hill is sour, because the rain washes down calcium. At the bottom of the hill the soil is rich in calcium washed down by the rain, and therefore it is not sour. Karen explains the role of calcium in the quality/acidity of the soil: calcium neutralizes acid.

2. Then the class went out into a forest to dig samples of soil and experiment with it.

Children worked in the same groups of 5-6, as they do at their home school. They got spades and questionaries to fill out information about the soil and their other findings, such as leaves on the top of the soil, animals and insects in the upper layer, properties of sediment.

It was hard for them to cut samples with a spade, as the soil was very hard on the top of the hill. It was much softer down the hill. where Karen took one sample for the whole class for comparison with the upper hill soil.

Every group did the following tasks.

They made sample list of soil with characteristics of each sample.
Dissolved a mix of all leyers of soil in a jar with water to observe sediment
Looked for animals around the sample hole, or in the sample itself.
All these findings were described in the questionnaire.

Examples of a soil sample list:

- 1) (soil sample attached by glue) BLØD (soft, black)
- 2) (soil sample attached by glue)..... KLUMBET (particles, grey)
- 3) (soil sample attached by glue)..... SANDET (sandy)
- 4) (soil sample attached by glue)..... FINT (fine, brown)
- 5) (soil sample attached by glue)..... SMULRET (yellow, rough)

Children were given a lot of freedom and independence; they had to deal with the difficult task of digging a sample, but were allowed to do it in their own way and at their own speed. It was a good example of group work, when they jumped on a spade one after another to get it deeper into the soil.

Karen was hardly interfering with their work, rather observing them from a distance.

This approach is common for most public and nature schools, and it is called ANSVAR FOR EIGEN OP LÆRING (responsibility for own learning). The main idea is to allow children to chose what they want to do and to learn what they want to learn. The teacher's role is to observe and to support with advice and knowledge.

The aim of the session was rather scientific. Children were very lively, happy and social. They seemed to work well in groups, dividing labour, taking turns. They took decisions about how to divide labour, how to get about the task. They had a chance to choose a part they liked, and to negotiate with their group members. This freedom gave them space for play and socialising at the same time. They never got bored of digging and working with soil samples. There seemed to be space for everything they wanted to do, be it a break, a chat, a joke, concentrated thought and action, or physical movement. In this way, many of their senses were free to be used and expressed.

They asked Karen questions once in a while, and she assisted. But still she kept a distance.

Anni, the teacher, was actively involved. She approached the groups and tried to help. Eventually, she stayed in one group. Perhaps, these children were shy than others, and did not cooperate well enough. But they were happy to have her, and worked with interest.

When all the tasks were complete, children closed the sample holes and brought their findings back to a nature school. There they continued to experiment with soil. They tested acidity and calcium content of different kinds of soil. Looked at leaves and plants found in samples through a microscope.

In an interview, Anni Bloom (on 21-10-03) said that children did not like the task of digging the sample, as it was really difficult. She gave them homework task for a weekend to dig such samples in their own gardens or nearby forest. They did not like the task in the first place, but were happy to bring their samples and discuss next week. She thinks it was rewarding for them to have learnt how to take the sample and be able to do it on their own. They discussed and compared samples from nature school and from their gardens and neighborhoods.

Theoretical comments

The session had a specific scientific focus, and contained many elements of cognitive approach. It was a part of a bigger thematical project about landscape at the school.

Children visited a geological museum prior to the session. They got knowledge of landscape formation and structure.

This session had little from Interpretation by Tilden, as it made no references to aesthetical, moral and ethical values, neither did it interpret and reveal new meanings of the nature. It seemed to be a purely a practical supplement to the scientific education at school and a part of the thematic project.

The organization of the session contained elements of Action Competence approach. It was in the democratic relations between nature schoolteacher and pupils, between pupils and their schoolteacher, as well as among the pupils themselves. They were given responsibility for their learning, namely, they could chose within the task what they wanted to do, and how they wanted to do it. They had no pressure of authority above them, and enough time and space for experimenting. On our opinion, it was a clear illustration of AC strategy to encourage pupils

to make their decisions and take a *competent action* within a certain task, in this case, for example, how to dig a soil sample, or how to divide labour within a group, how to come to a consensus with each other. They have learnt some scientific facts before they were given a practical task, and these facts were a foundation on which they built their *competent action*.

Anni Blom, the schoolteacher in nature & technique, addressed environmental problems and ethics when she held an introduction and follow up lessons to the project. She talked about specific characteristics of the Danish landscape and soil, and how it is affected by pollution. Brought an example of eutrophication, and how it destroyed lakes in Sweden. It did not have such effect on the Danish lakes due to high content of chalk in the Danish ground water. They have done chemical tests with ground water in a classroom.

The project also had an artistic part: another session at the Raadvad nature school when the children painted a landscape.

Raadvad Nature School

Age: 5th grade, 11-12 y.o.
Theme: landscape painting, aquarelle
Nature Formidler: Signe Dinsen (freelance nature interpreter)
Schoolteacher : Anni Blom (naturteknik), Mia Liv (billedkunst), Nærum skole
Date: 29-09-03

This is a part of the landscape theme at the home school.

The session can be divided into 3 parts:

- 1) classroom introduction to the theme, a few tips how to draw landscape with perspective
- 2) field work in the nearby forest/park: painting a lake with the forest
- 3) small exhibition and reflection and comments from Signe.

This class was going through a landscape theme when it had attended (1) soil and (2) aquarelle landscape painting sessions.

Their teacher of nature science (biology, geography, physics in mellemtrin) has booked these sessions to match the theme at home school. Prior to the soil session the class went to a

geology museum, and was given a kind of lecture on landscape formation, and Zoological museum.

Aquarelle Tour

1. Signe showed how to draw landscape in perspective. First, by making examples on a board, then by showing her own painting of a coastline. She explained how to use watercolours, how to make new colours by mixing them.
2. Then we all went down to a lake, where we tried to find a spot with a good perspective to a painted landscape. Pupils were given very little advice in finding their point of view; they were supposed to be able to discover it by themselves. Signe was giving advises on technique and colours to all individually.

This session was one of the most favourite activities children had during their landscape theme?

Time went by unnoticed. Painting in the nature makes you take a careful and deep look at it. It makes you relaxed and harmonised, close to meditation. It has been a moving experience, it brings you closer to nature than it might seem. I experienced some kind of intimacy with this lake. The pictures came out to be good too.

3. Signe put all paintings up on the wall, trying to match them according to bright or soft colours, so that a mosaic pattern appeared when they all were up on the wall.

She came up with an endless row of very individual and personal comments to each painting. They were all appreciated, seen as very special. Children were greatly rewarded by her comments.

These paintings became a part of an exhibition at the open house day in Raadvad nature school. They were exhibited in the Nærum school afterwards as well.

Theoretical Comments

This session was very much in line with the Interpretation by Tilden. Everyone was forced, willingly or unwillingly, to observe the landscape with the purpose of understanding its colors and its other visual characteristics in order to capture them visually and then re-create on paper. This process involves some abilities of the mind, besides vision, that make a painter to experience the observed landscape in a spontaneous creative manner. Through painting nature a person connects with it, looks for recognizable features, merges it with his/her own

imagination and expresses this state of mind in a painting. A painting thus becomes a personal perception of the landscape, a unique expression of personal connection to it.

With the knowledge of ecological empathetic philosophy on one side, and instrumental Action Competence on the other side, we want to continue the course of discussion by integrating notion of tacit knowledge and the role it has to play in these two approaches to learning.

10. Tacit Knowing

The nature of teaching practice in NI and at nature schools suggests that their methodological emphasis lie largely in the area of tacit knowledge. Practical exercises, experiments, other activities that are perfumed makes pupils actively participate by using their tactile skills, and all their senses.

Theory of tacit knowledge is the one that would be the most appropriate background for such methodology, and I therefore would like to explore some distinguished writings and authors in this field in order to test the validity of the theory for our case.

One of the fundamental writers on tacit knowledge Michael Polanyi has made a few publications, and among them a few essays, that I could get hold of, in a book called "Knowing and Being", edited by M. Grene.

In these essays Polanyi refers to many different aspects of knowing, such as from the medical point of view, linguistic point of view, as well as philosophical. He illustrates the theory of tacit knowing with examples from so different sciences as medicine and linguistics, and thereby creates an overall philosophical framework that explains all knowledge from the tacit perspective.

"All knowledge falls into one of these two classes: it is either tacit or rooted in tacit knowledge. The Ideal of a strictly explicit knowledge is indeed self-contradictory; deprived of their tacit coefficients, all spoken words, all formulae, all maps and graphs, are strictly meaningless." (Grene, p. 195)

Polanyi detects a functional mechanism of tacit knowing which works for all kinds of knowledge, in all kinds of sciences. According to this mechanism, an object of our visual attention, for example, exists in two dimensions - focal and subsidiary. Its focal dimension

applies to the whole image of the object the way we understand it. Subsidiary dimension applies to all the details, or particulars, as Polanyi calls them, which we are not consciously aware of, but which contribute to the focal image by integrating into it.

The same happens when a word is uttered. We receive the meaning of the word without paying attention of how is it constructed. Its meaning is in our focus, while the separate sounds of which it consists are transparently integrated into the focal image.

”Every time we concentrate our attention on the particulars of a comprehensive entity, our sense of its coherent existence is temporarily weakened; and every time we move in the opposite direction towards a fuller awareness of the whole, the particulars tend to become submerged in the whole”(ibid, p. 125).³⁴

”These two kinds of awareness - the subsidiary and the focal - are fundamental to the tacit apprehension of coherence”(Grene, p. 140).

Polanyi elaborates on the example of language skills. ”While language expands human intelligence immensely beyond the purely tacit domain, the logic of language itself - the way language is used - remains tacit”. A set of sounds transforms into a name, which in turn becomes an abstract concept. The set of sounds thereby becomes transparent, meaning it is not perceived as merely a set of sounds. The focus of attention is no longer on the sounds but on the meaning of a word.

The tacit domain of knowing about the world thus is a phenomenon that empowers the intellectual learning, and opens wide perspectives on learning mechanisms. It has, of course, always been there in education, whether recognised or not.

Consideration of tacit learning mechanisms and skills in formal education could enhance educational process. It would have been interesting, but we are not going into investigation about how and where is tacit knowing theory applied in formal education. Our purpose is to emphasize its importance to educational process as such, and investigate what is the place of this theory in relation to the methods used in nature schools in Denmark.

Tacit knowledge of things is referred to as knowledge of things interiorised into ourselves, into our bodies, or in other words, as extension of our bodies.

³⁴ Essay called ”Knowing and Being”, pp.123-137

”Such extension of ourselves develop new faculties in us; our whole education operates in this way; as each of us interiorise our cultural heritage, he grows into a person seeing the world and experiencing life in terms of this outlook” (ibid, p.148).

This theory gives solid grounds as to how knowledge is created, both intellectual and tacit. How can we now use this theory to validate teaching methods used at the Danish nature schools?

Our pre-assumption was that tacit knowledge is another kind of knowledge applicable to some selected kinds of activities and things. Knowing the tacit base of all knowledge how can we argue that teaching methods targeting tacit knowing are better than those targeting intellectual knowing?

Perhaps, certain kinds of knowledge do not have to be intellectualised.

”The fact that we can possess knowledge that is unspoken is, of course, a commonplace, and so is the fact that we must know something yet unspoken before we can express it in words. It has been taken for granted in the philosophical analysis of language in earlier centuries, but modern positivism has tried to ignore it, on the grounds that tacit knowledge was not accessible to objective observation. The present theory of meaning assigns a firm place to the inarticulate meaning of experience and shows that it is the foundation of all explicit meaning.”(ibid, p.187)

When children experience nature, they acquire meaning of the things they see and touch, smell and taste, yet not always explicitly. A nature interpreter guides them through the forest or another site and attributes the unknown with names. However, the ability of the mind to observe is much bigger than just one concept at a time. There are an endless number of subsidiary particulars that appear along with or within the object in focus. This tacit experience is also diversified by the different senses that might be activated. A focal intelligible object may be a result of integration not only of particulars from a paradigm of the same sense, as for example, vision, but also paradigms of other senses. Such comprehension of an object is so tacitly diverse that it is almost impossible to isolate the facets of comprehension. Can this knowledge be called intellectual or explicit? To some degree, yes, as long as it is conscious. Yet the largest part of it is still unspoken, as it is integrated within our feelings and can be expressed only tacitly.

Recognizing tacit powers of the mind is essential for education, and especially for education where the subject is of a tacit nature. Nature education has a goal of giving practical and physical experience, rather than creating abstract knowledge. It is the area where the theory of tacit knowing and meaning can be applied most explicitly.

The methods employed in NI for children rely heavily on the tacit skills of the mind.

Many of the tasks and questions do not require intellectualisation. They contain a stimulus for exploration and using senses in familiarizing with nature, they encourage children to find their own meanings of the nature around them. The process of tacit familiarization with an object Polanyi calls *indwelling*. "Tacit knowing now appears as an act of *indwelling* by which we gain access to a new meaning". (ibid, p.160)

"Since all understanding is tacit knowing, all understanding is achieved by indwelling" (ibid). It is hardly possible to give a better formulation for tacit knowing.

By comprehending we indwell or inhabit the details of the object in focus, and thereby make them a part of ourselves. Thus we expand our boundaries to the limits of the comprehended object.

"We may be said to live in the particulars which we comprehend". We 'participate feelingly in that which we understand'. Understanding 'gives us a sense of mastery which enhances our existence' (ibid, p.148-9).

The boundaries of our comprehension and our comprehended world can also be regarded as physical boundaries in terms of our physical bodies the way we feel them.

"It is the subsidiary sensing of our body that makes us feel that is *our* body. This is *the meaning our body normally has for us*" (ibid).

"Whenever we experience an external object subsidiarily, we feel it in a way similar to that in which we feel our body. And hence we can say that in this sense all subsidiary elements are *interior to the body* in which we live. To this extent we dwell in all subsidiarily experienced things"(ibid, p.183, *Sense-Giving and Sense-Reading*).

"To sum up, meaning arises either by integrating clues in our own body or by integrating clues outside is due to our subsidiary treatment of external things as we treat our body. We maybe said to *interiorise these things or to pour ourselves into them*. It is by dwelling in them that we make them mean something on which we focus our attention"(ibid).

"The theory of tacit knowing establishes a continuous transition from the natural sciences to the study of the humanities. It bridges the gap between the 'I-It' and the 'I-Thou', by rooting

them both in the subject's 'I-Me' awareness of his own body, which represents the highest degree of indwelling"(ibid, p.160, *Tacit Knowing: Its Bearing on Some Problems of Philosophy*).

"The process of integration assimilates them /external objects/ to our body and to this extent deprives them of their character as external objects"(ibid, p.184).

Conclusions

This theory provides conceptual framework for our discussion about experiential methods of learning. It constructs a comprehensive system of knowledge and understanding of the world where all understanding, conscious or unconscious, is rooted in tacit knowing. This system, well grounded and illustrated, provides us with a framework of concepts for understanding the essence of the experiential methods of NI and nature schools.

11. Construction of Integrated Cognitive-Experiential Knowledge

In this chapter we identify experiential phenomenological learning approaches to learning in nature and for the nature. Furthermore, we would like to look at what are the outcomes of the experiential learning and how are they utilized in classroom learning in public schools.

Our essay called "Knowing and Being", pp.123-137r empirical research is about lower secondary public schools in Denmark, and how they approach and use the educational resources of nature schools and NI. Our preliminary research has identified problematique of cooperation between public schools and nature schools in terms of institutional, educational and knowledge exchange, as discussed in the introduction chapter. Interviews with nature interpreters taken in the beginning stage of the research have given us an overview of the pedagogic practice of nature schools and how do they cooperate with public schools. Our curiosity lies in the question about what public schools and public school teachers do to take the most advantage of the nature school education to supplement their theoretical classroom work with practical experiential knowledge.

What kind of knowledge is or should be constructed on top of the experiences in the nature? Should it at all be classified? How do teachers integrate the experiential tacit knowledge into the cognitive theoretical construction?

We do not have any pre-assumptions about that type of cognitive knowledge. It could be anything. This is merely a question of recapturing direct experiences into classroom teaching; thereby making those experiences live and expand beyond the time and space frame of a nature school session. Experiential encounter with new knowledge awakes interest and then prepares receptive ground for theoretical seeds, which supposedly conceive a qualitative change in consciousness.

It is a pre-assumption that it is the cognitive construction that, by attributing explicit meaning to phenomenological knowledge, has the main role to play in raising EA and shaping attitudinal change towards care and concern.

However, there are different levels of outcome from nature school sessions. It depends not only on the performance from the side of a nature school, but also on the input from public school teachers attending a nature school with their classes.

Any input is better, than no input, and any effort would bear a fruit, depending on its aim.

A teacher might just limit the follow up to a mere re-collection of spiritual, emotional, experiential sensing of nature (example: making artistic landscapes, Christmas decorations from materials found in the forest). This would then be a question of maintaining the sensual experiential knowledge.

Another kind of input would be to integrate experience into a subject theme, and build theoretical knowledge on top of the experiential knowledge. This kind of input would supposedly transform experience into cognitive knowledge, which is acquired primarily through tacit learning. Cognitive comprehension of tacit knowledge allows not only to understand but also to use the knowledge. This kind of knowledge is not only theoretical, but also personal because it has been acquired through a body and its senses. It becomes a part of a personality and thereby involves ethical values.

12. Conclusions

How do the threefold EE formula and the classification of man/nature relationship relate to each other? The three kinds of EE are different pedagogic approaches, which may be using philosophical framework of the man/nature relationship. However, we will refer to both

pedagogic and philosophical dimensions of EE further on in our discussion about NI as an alternative kind of EE.

Deep ecology is a philosophical school with a holistic approach to man and nature. It does not have a distinct pedagogic line, a special methodology of learning and teaching that would promote its philosophy. Action Competence, however, is a school of pedagogic thought with a distinct methods and principles grounded in cognitive learning through involvement in practical real life social and environmental problems. It is a kind of political educational strategy based on principles of democracy and participation.

Initially we adopted a critical approach to AC from the position of deep ecology. AC aims at social gains, improving human society, introducing democratic values, but it does not consider nature as an equally important part of the human world, but rather as a set of disposable resources. Nature is cared for as long as it is beneficial to man. Moral responsibility for other species is not a value in this approach.

In the course of research and upon review of literature on EE research and AC, it becomes evident that NI, as tacit kind of learning, and AC, as a cognitive learning, both are experience and action oriented. They can co-exist and be combined in practical environmental education. Each of them pursuing environmental consciousness of a special kind, they use different approaches and methods, which in combination have a potential of a comprehensive experiential-cognitive environmental education.

EE arrives at the question about the relation of man and nature. Among many possible answers we favour those found in deep ecology school. It does not only provide a valid answer to the question about relation between man and nature. It might be the philosophy that lies behind NI, as a practical educational approach. The principle of expanded self and inseparability of man and nature in deep ecology resembles the goal of NI to establish connection and common identity with nature.

AC has been in the centre of the educationalists discussion for the last two decades and elements of it are applied in public schools in terms of the strategy called “Responsibility for your own learning”. It is an optional approach, but many schools in Denmark have accepted it as their main pedagogic style. Furthermore, some nature schools have adopted the same approach, as they are free to choose their way to teach.

Development of philosophy and practice of EE has led to emergence of a new methodological approach in EE, called by Palmer 'education *in* and *for* the environment'. Methodology in question is rooted in the theory of tacit knowledge and implies main focus on experiential phenomenological learning. Theory of knowledge provides conceptual framework for explaining educational gains from experiential learning approach of nature schools, and allows taking a deeper look into the interplay between cognitive learning and tacit knowing in the educational process.

The reason we bring up the notion of tacit knowing is that our research is about an alternative approach in EE. In conventional scientific perception knowledge is cognitive, it is obtained through intellectual cognition. It is also common knowledge that cognition is based on knowing of another kind, which operates on the unconscious physical reflective level. As it is a fundamental fact of life, it becomes hard to phrase explanation of this concept, as we are not used to explaining obvious things. Nevertheless, we attempt to do it here in order to bring to the surface of cognition the mechanisms of unconscious phenomenological knowing and learning. This type of knowing and learning is the central idea in the methodology of NI. It relies largely on learning by doing, on hands-on experience, on involving all human senses in perceiving a subject of interpretation. It is essential to apply the concept of tacit knowing to NI, because cognitive mechanism of learning cannot explain comprehensively how the experiential learning operates and why it is more suitable and effective in the case of NI. In fact, it is hardly possible to perform NI without relying on experiential learning and tacit knowing. The subject of interpretation is nature, and the activity environment is nature. These preconditions imply that the education is not just intellectual; it is about being in nature, and being active in interacting with nature. In order to be in nature, we do not require intellectual skills, we have to rely on our senses and reflexes.

Examples of observations from nature schools illustrate integration of elements from both NI as approach in EE and from AC. Talking about these approaches, they can be referred to by terms marking experiential and cognitive learning accordingly, the first relating to the philosophical concept of 'body', and the second – to the concept of 'mind'. It is most useful, on our opinion, to involve both pupil's 'mind' and 'body' in the learning process in order for the knowledge to be 'embodied' and consequently 'acknowledged'.

Chapter 5. Narrative analysis of six interviews with public school teachers

Analysis of interviews is done in a form of narrative answers to seven research questions. Narratives are formed by aggregate answers extracted from six interviews. We illustrate our findings with some quotes from interview material, but mainly refer our reader to the interview material in the appendix.

In the final statement of the chapter we try to answer two analytical questions in the light of our empirical findings:

- 1) What are the possibilities to improve cooperation between nature schools and public schools?
- 2) What are the difficulties in cooperation between nature schools and public schools?

1. What is public school teacher's motivation to take a class to a nature school?

Our empirical data shows there are several strong factors motivating public school teachers to take their classes to nature schools. Here we answer the motivation question in the light of the interviews with six teachers from our case studies. When we refer to public school teachers, we refer to the six teachers from our case studies.

First and foremost, nature schools are an attractive option for an educative field trip and an alternative way of approaching a school subject. In answering the second analytical question about the difficulties for improving cooperation between nature schools and public schools, we again draw our conclusions from “best practice”, because, similarly to answering the first analytical question, in order to be able to find valid difficulties, we need to research cases where reasonable amount of activity takes place. In cases of “worst practice” we fear to have found difficulties of another kind, not specific enough, for our research. For example, it is an obvious difficulty if a schoolteacher does not give any importance to nature education, or if a teacher is overloaded with work, and simply has no resources to consider nature education.

This kind of basic problems would not lead our research to difficulties specific for cooperation between the two institutions, for the cooperation has to be there already.

Nature school offers education sessions, which are

- guided by a qualified nature interpreter
- often free of charge for public schools from the same municipality
- of reliable quality
- using child-oriented methods of teaching
- provided with tools and materials
- carried out in an open natural environment

Being an attractive offer nature schools often serve as very useful practical supplements to the school subjects, which require experimenting and hands-on activities in the nature. The school subjects, which require or can benefit from experimenting and hand-on activities to various degree are Nature & Techniques (N&T) (which consists of biology, geography and physics), housekeeping (hjemmekunstskaab), and drawing. It is also possible to use a nature school for teaching subjects not directly related to nature, such as Danish, history of religion, mathematics, and, perhaps, more.

Most of the interviewed teachers believe in importance of tactile methods for initiating interest in learning about a subject. Mette Brandt: “ I think it is great and I like to get “hands on” as well. And as a teacher, because I think it is a good way to start an interest and some sort of align of teaching or subject and it is a good way to learn things” (Appendix, Interview with Mette Brandt, p.1)

A teacher from Baunebjergskole, Elin Landerslev, who grew up on a farm on the Faeroe Islands, has got rich personal experience with animals, which she values as interesting and important for young people to go through. She is a biologist, and she is very fond of hands-on activities in the nature, when she can use her senses. Elin Landerslev wants her pupils to get similar experiences. She found her inspiration for the deer tour in an NI tour her class went for a few years ago when she worked at another school. There seems to be a sequence of connected factors linking Elin’s childhood on a farm to a deer tour she chose to take her classes to. Elin attempts to reproduce this pattern for her pupils. Her example shows how

important it is to have had direct personal experience of nature in childhood in order to have a personal attitude for it and interest in educating about it in adulthood.

A teacher from Pilegårdskolen, Michael Hansen, is a passionate about birds, and he is especially interested in eagles. He has a similar history of coming from a farm environment in Jutland, the Danish mainland. He recognizes that compared to his own childhood his pupils, who live in a big city, have almost no connection to nature or even farm animals. Some of them saw a chicken for the first time in a nature school. He wants his pupils to connect to nature through their senses, by being in the nature.

All the teachers are convinced that nature school sessions are almost a perfect place to give children hands on experiences in nature and to connect them to nature. Considering that most Danish children visit a nature school on average once a year, five of the teachers think, that, no matter how little time their classes get at a nature school, it is still worthwhile going there, and that children will get something out of the session anyway. One of the teachers, Kim Olsen from Birkelund school, is more sceptical and thinks, that one session a year at a nature school makes no difference in terms of nature education or supplementing public school subjects. He sees a visit to a nature school rather as a convenient outdoor entertainment. However, he also finds inspiration for his own work in the themes of a nature school and in his observations of children's reactions and behavior. Considering the low outcome of nature school education due to its discontinuity, a choice between a visit to a nature school and a visit to a Zoo, is resumed in favor of a Zoo, because, as a one time event, it offers more dramatic and exotic experience than a nature school. A vague promise of a fox cannot compete with a certainty of seeing an elephant. An overall outcome of going to a Zoo is then, according to Kim, better, because, first of all, children get to see exotic animals, experience something they can not find in their own forest, they get to see much more animals than in a visit to a nature school. Then, by getting exciting experiences together, children get common memories and references, which would improve social setting in a class. Positive common experiences also give useful references a teacher can use in his subject teaching when linking to children's everyday life. Kim tries to integrate into education process all the experiences his pupils get during different field trips, be a nature school, or a theatre performance.

Sometimes a visit to a nature school is decided upon by a group of teachers working with the same classes. In this case, a nature school is a place where interests of several subjects can be

realized at the same time or combined. For example, a teacher of N&T and a teacher of drawing from Naerum School planned two separate visits to the Raadvad nature school under a common landscape theme. Although there was a separate session for each subject, the two of them were united under the same theme the class had for one week in their school, they were both a part of the theme and planned to take place during the week of the theme.

As to the formal framework, visiting nature schools is not a part of a curriculum, and it is optional. However, content of natural sciences for each grade requires a certain level of knowledge about nature, animals and environmental problems. “According to formal requirement I must teach the 2nd grade class about the nature, about birds and animals that live in the nature. So we took them to the nature school. There are some children that have never been there before” (Appendix, Interview with M.Hansen, p.1). In this way, schoolteachers are encouraged to use a nature school for nature education.

Another strong motivating factor is that some teachers on N&T did not get appropriate education to teach the subject, and they find great support and inspiration at nature schools. The reason for such a seemingly strange situation with N&T teachers is the commonly adopted strategy by public schools to assign one teacher more than one subject.

The idea behind this strategy is to decrease the number of teachers working with the same class, what is considered to be beneficial for social and psychological environment of a class. With fewer teachers children build better relations, and are less disturbed by authority and changes.

There are certain sets of subjects a teacher can have. For example, a teacher of mathematics often gets N&T as the second subject. Often a teacher is forced to accept a new subject against her/his interest. Nature schools are a real asset for those teachers.

“You can not have experts on every subject. We do not have many teachers, so the knowledge is diverse. So some teachers have to take subjects they do not like. I think it is good that the teachers can go to the nature school then and get inspiration to do things they would not come up with themselves” (M.Brandt, p.1). It does not replace teacher’s own work, but it shows how to teach a new subject, where to look for information and help, what kind of methods to apply, etc.

School administration has little influence on the cooperation between nature schools and public schools. Initiative comes from teachers themselves, and school management usually supports this cooperation. Usually there is an established link between the two parties. Some

public schools have an appointed contact person for a nature school, like at the Pilegårds School; at other schools it is an enthusiastic teacher in N&T, who keeps regular contact with a nature school, like A. Blom at the Nærum school. Nature schools actively advertise themselves for public schools, and it is easy to contact them. Each nature school has a web page with updated information about nature interpretation options and how they suit certain grades. They also distribute leaflets and brochures to public schools.

In Lyngby-Taarbæk municipality, according to Raadvad nature school leader Dorrit Hansen, every year all newly employed public school teachers are given an introductory excursion to Raadvad nature school³⁵. They are shown the facilities of the nature school and told about the possibilities for nature education and for practical support to curriculum subjects.

Nature schools seem to do their best in advertising themselves to public schools and adjusting to the needs of public schools. Public school teachers, on the other hand, struggle to get a session of their choice, what often is not easy. It appears from all interviews that the main and often the only problem teachers encounter with nature schools is that it can be very difficult to book a desirable session on a desired date. Furthermore, it is hardly possible to book more than one session a year. Some nature schools, like, for example, Raadvad School, invent flexible cooperation models in order to extend access to the nature school for an individual class for more than one session. These models involve education of public school teachers what enables them to perform nature interpretation and use nature school facilities independently from a nature school guide.

According to all interviews, nature school sessions are also important social events for a class as a social group. Children do not only experience nature and learn about it there, but also learn to play, socialize and cooperate in a new, more natural and free setting, get to know each other, make new bonds within a class or a group. Teachers see nature school sessions as a combination of social and educative activities, and they give great importance to social aspects as well as to educational aspects.

While majority of the teachers interviewed are very positive about the importance of the nature school education, a few of them are quite sceptical.

Kim Olsen from the Birkelunds school sceptical teachers said that he could not see connection between the nature school education and his own work. It was more of entertaining outdoor

³⁵ Interview with Dorrit Hansen, Raadvad nature school leader, October 2003.

nature experience for city children. The teacher is sceptical about the educational capacity of nature schools. His work is theoretical and he can rely completely on study books to teach his subjects (N&T and maths), while nature schools do ‘their own thing’ which cannot help his teaching:

“I have my own agenda now/and it is not integrated with nature school/it is there and it is an institution in Albertslund/and the school system and program in my education of the children is pretty much available in the books I am using/so we are separately doing our own things” (Appendix, Interview with K.Olsen, p.2).

This teacher was rather sceptical in the beginning of the interview, possibly with regards to limited access to a nature school one class can get. However, his attitude was gradually becoming more positive during the course of the interview, as he spoke about his experience of a nature school and what are possible connections to his subjects and his work. He ended his interview concluding that if a nature school could give one class more time it would be useful for his subjects, for children’s nature education, and eventually have an impact on children’s general education.

2. How do public school teachers integrate children’s experience from a nature school into their subject teaching?

As already mentioned in part 1, a nature school is an attractive offer; it provides children with educative experiences in the nature:

- nature school guides know well the surrounding nature
- special educational tools/equipment for nature education
- effective educational methods: nature school guides “speak to children in their language”

The role of nature schools is to supplement public school education with experimental and experiential practice.

Nature schools are considered primarily useful in teaching nature & techniques, and, in fact, are primarily used for this subject. Other school subjects that have interest in nature schools and that are often practiced there are housekeeping and drawing. Often a teacher in N&T has housekeeping and drawing as the second or the third subject.

Despite of their role as formulated above, nature schools are not always perceived by teachers as an appropriate place for their subject teaching. Some have doubts whether the time children spend at a nature school is enough for education, and they see a nature school session rather as an entertaining, re-creational, social outdoor event.

Consequently, the degree to which teachers incorporate nature experiences into their subject education, varies significantly according to the level of teachers' interest in a nature session as a practical supplement to their subjects.

Those teachers who want to use every chance for practice in nature, usually prepare children for the session by giving a prior introduction and even doing some classroom work in advance (especially if a session is planned as a part of a project). Follow up, however, is given more weight than preparation.

In cases when a teacher could not book a session at a desirable time, follow up can be difficult because often a trip takes place during another theme in the subject. For example, an aquarelle session at the Raadvad nature school took place while the class was in another theme and drawing competition. The nature school session was an opportunity to try new techniques and colours (aquarelle) while being in the nature and drawing nature. Mia Liv, the teacher of drawing at the Naerum School, did not have time for following up the session right after it took place. She discussed the experiences, colours and techniques shortly. However, she planned to return to this aquarelle landscape drawing session later, when the class was through with a competition and their drawings were returned from an exhibition at a nature school. They were then exhibited at the home school, and the class got an opportunity to share their experience and the knowledge of colours and techniques they acquired with other classes. Mia thought it was very important for the children to talk about the session, and she also new that they enjoyed the session, that they were proud of their drawings, and that they liked to talk about them (Appendix, Interview with Mia Liv, p.2).

Some of the more sceptical teachers see a nature school session as an isolated one-time event. Nevertheless, Kim Olsen, a teacher who expressed such a view, also told that he used common experiences of his class in N&T and mathematics lessons, for example, when there is a theme or calculations about agriculture.

Ethics

Some of the teachers emphasise the role nature school has to play in shaping young person's world view and ethics:

“When they grow up, they will remember this experience and it will model their views. Because if the nature school was not there it is not enough just to learn about nature, you have to see it and be in it as well” (M. Hansen, p.2).

On a tour to Dyrehaven³⁶ children learnt where food, specifically meat, comes from. They learnt that they have to kill in order to eat meat. Cutting up a dead deer caused different reaction, but no one was indifferent. Although many children thought it was very unpleasant to see how a deer was cut open, most of them stayed and continued watching, as they were too curious to leave (Appendix, Interview with E.Landerslev, p.2). This session opens a way to an ethical discussion about death and killing animals. The price for eating meat, the amount of meat humans need, the quality of animals' life and the ways of slaughter are discussed.

The dramatic experience of this session raises many feelings and issues for children and gives ways for integrating the experience into various subjects. For example, according to Landerslev, by observing and touching deer's body parts and organs, children do not only learn about the animal's life and anatomy, it helps them, in a comparative way to learn about human anatomy and physiology (Landerslev, p.3).

Nature interpreter's personality, professional knowledge and pedagogic skills mean a lot for the quality and success of nature interpretation.

According to Landerslev, the nature interpreter in the Dyrehaven tour, Annegrete Munksgaard, knew well the forest, its history, the shooter of the deer, how to cut up an animal, etc. She was good at talking to children, she knew their reactions.

This nature session helps to understand life and environment of an animal (a deer).

In order to save natural environment, we need to shape caring attitude. In order for children to have care and feelings for animals, they need to see those animals. Nature and love for nature is an ethical value. It is an important condition for happiness (Landerslev, p.4).

3. How are nature school sessions integrated into in thematic projects at public schools?

Nature school visits are often planned as a part of school projects. It is more effective to plan nature activities together in an intensive project (E. Landerslev, p.5).

³⁶ The Deer Park in the Northern part of Copenhagen

M. Hansen and H.Bjorn from Skottegårds School planned a visit the Taarnby nature school within a small project about birds. The Taarnby School has a great collection of stuffed birds, which they have purchased just a few years ago from a private owner.

Prior to the visit the class watched a film about eagles and had lesson in biology about birds. Pilegåds skolen also has a small collection of stuffed animals, including birds, in its biology class.

After the nature school visit the class did a few written exercises about birds, when they had to indicate main characteristics of certain species, make questions about their life, and find answers in a library. Children could remember a lot from their experience at a nature school. The teacher could build on this knowledge and teach more about birds. “The motivation factor is the main function of a nature school” (M. Hansen, p.3).

The Dyrehaven deer tour was a part of two week green project “Experiencing nature” at the Baunebjerg School, when most classes of the school went for different activities in nature. Children could choose what they would participate in. They wrote down their impressions in their special diaries for this project. The deer tour was an important part of the project and every pupil in the 3rd and 4th grade had to join. The teachers planed their schedule together, and they can use the experiences children got from this project in other subjects.

During the fourteen days of the project children from three classes joined up together in different activities:

- fishing
- sleeping in the woods in shelters
- planting flowers in the school’s “green” garden
- bird watching
- the deer tour in Dyrehaven
- visiting classmates with pets in order to learn about the pets (cats and birds)
- making drawing about the activities
- writing down their impressions and experiences

The main idea behind this project was to give children positive experience in the nature, to make them feel happy with the nature (Landerslev, p.5).

During the landscape theme at Naerum School, where soil tour and aquarelle tour were a part, children did the following activities:

- a. reading a book about landscapes;
- b. watching videos on the Net with some scientist who talked about Ice age;
- c. visit to the Geological Museum, where children had a lecture on landscape formation, and where they could touch the stones that they saw on the videos;
- d. visit to a zoo;
- e. experiments in a classroom;
- f. discussion following the experiments;
- g. soil tour at Raadvad nature school;
- h. follow up on the soil tour;
- i. aquarelle session;
- j. exhibition of the pupils' drawings at the Raadvad nature school
- k. exhibition of the pupils' drawings at the Naerum School

4. What kind of learning motivation factors do pupils find in the nature?

The following statements are the condensed answers from all the interviews.

Positive experience from activities in the nature motivates children to do that again.

In the fishing tour in Raadvad children learnt how to fish, and were rewarded by getting good catches. "I think they thought it was great, and many of them wanted to try going fishing on their own" (Matte Brandt, p2).

According to all the interviewees, children are more receptive, more social and cooperative in the nature. Finding practical solutions together is rewarding. Children like to be outdoors, away from their school. They like to be able to move freely with who ever they like. They often very interested in a new teacher, the nature school guide. It is a new place, new classroom, what is a refreshing change of learning environment and stimulates interest. Children experience each other and their schoolteachers in a new way. They are greatly rewarded by the discovering, finding things in the forest, getting a good catch, making artistic things, receiving recognition and positive feedback from a guide and from fellow class mates. In the nature they can focus for longer time than normally in a classroom.

Freedom to choose activities and to take a decision by themselves makes children more interested in what they do. Every teacher said, that children like how they are taught and treated at a nature school. They get very excited from direct contact with live animals, and are very interested in seeing and touching stuffed animals. They liked to walk outdoor, to watch wild birds fly, to sort birds' bone peaks and paws. The mere fact of going away from school to an outdoor field trip is a strong motivating factor for children.

However, Kim Olsen observes, that urban children are detached from nature due to their lifestyle, when they are busy at school during the day and stay indoors reading or watching TV in the evening. According to Olsen, they are not 'used' to nature, they do not 'know' it well, and therefore, in general, they do not show much interest in nature (Kim Olsen, p. 4). It is not sure what Olsen refers to in this statement, or what level of interest to nature he compares with. But there is a clear logic in his statement, which implies that children need to know nature, to connect to it, in order to be interested in it. This statement also emphasises that children lack nature experiences in their everyday life at home and at school. Absence of references and personal experience makes it difficult to teach them about nature. In this case, children have too little 'life experience' to build new knowledge on. Olsen suggests that, in order to make children interested in nature, one nature school session a year is not enough.

5. Is there any influence from nature schools on pedagogic practice in public schools? How different or similar are their practices?

According to every interview, public school teachers do many things in the same way as they do at nature schools.

Education methods at a nature school involve children in "hands-on" exercises with new nature objects. According to the interviews with teachers, children are strongly motivated in this way. Teachers observe a great impact experiences in nature have on children, which they evaluate as very positive. Such practice involves children's all senses in the process of education and creates much stronger interest and reaction compared to conventional classroom methods.

Mette Brandt, a teacher in N&T and music, lets children have practical experience of the subject before introducing theory (Mette Brandt, p.2). This is how she characterises and evaluates her methodology:

- *This is a good motivation for young children, especially for boys*
- *With older children it can be the other way around*
- *With mechanical objects short theoretical introduction proceeds experiments*
- *Boys and girls need different methods, boys are more into experimenting prior to any theory*
- *Nature education calls for experiential methods: “In my opinion, they show a different way of teaching that you do not have to read ten pages before you can answer any question. [...] We inspire them to read maybe later”*
- *Nature school backs up theoretical knowledge with experiential knowledge (Mette Brandt, p.2-3).*

M. Brandt uses methods very similar to those seen at nature schools (start with short theoretical introduction with demonstration, then continue with experiments), but public schools often lack resources to perform the same education: a forest nearby, tools, expertise in certain areas of natural science, etc.

Pedagogical strategy in Danish public schools is about work form; it changes with every new government, and it is open to interpretation. Public schools give teachers freedom to use methods of their own choice. Dominant pedagogic philosophy in many public schools is Howard Gardner’s theory of Many Intelligences (E. Landerslev, p.7). This philosophy advocates intelligences of different kinds related to different senses, and not only intellect. This philosophy seems to go well together with the theory of knowledge and tacit knowing. It creates conceptual space for integrating theory of tacit knowing and tactile methods of teaching into the overall pedagogical and methodological approach of the public schools.

On the side of methodology, a philosophy called “Responsibility for own learning” has been adopted in most schools, according to the interviews with the schoolteachers. It is an approach promoting independent thinking, decision-making and action of the growing up generation.

Most nature interpreters at nature schools are not educated to be teachers. Nevertheless, they are usually very pedagogic in their approach to children. Their approach differs to children of different ages, and they have a variety of ways to communicate their subject to them.

Teachers exchange teaching knowledge with nature guides (Mia Liv, p.4).

From our observations, we conclude, that at nature schools children are given a lot of freedom in the process of experimenting. They are free to find their own solutions and are given limited guidance, as well observed in the soil tour ³⁷. Such a challenge stimulates their creativity and interest in what they do. They are given responsibility for their own actions, and education. Teachers observe pupils from a distance and give them limited advice when necessary.

As in the soil tour case, when children had to do soil sampling in their gardens as home work, a follow up activity at a home school demonstrates that the same methods can be applied to the public school classroom education and the nature school education. Furthermore, this example shows how successfully it is possible to continue a nature school theme at a public school, and how close it is possible to come to the situation of the nature school education away from a nature school. Furthermore, the teacher in this case (A. Blom) intends to continue the landscape theme with the same class in the years to come. For example, in the next year she plans to study landscape by maps. She would then naturally refer to the knowledge children got during the previous years both in a classroom and in field trips, including visits to the nature school. We think it is a great advantage for the class to have A. Blom as their teacher in N&T. She knows exactly what children have learnt before and she knows how to carry on nature education with these children based on their knowledge and skills.

6. What do public school teachers do for nature education independently from nature schools?

Schoolteachers conduct many experiments not related to the nature school experience, and they take their classes to many field trips not related to nature schools.

However, these experiments and field trips may be coinciding and integrated with nature school sessions, as in the example of the landscape theme at the Naerum School.

In geography and physics it is possible to do many practical exercises in a schoolyard. While biology needs most “hands on” experience. Matte Brandt from the Naerum school takes her

³⁷ Chapter 4, Empirical Observations, Raadvad Nature School

classes on a tour once in a while (trips to a pond and a plant trip). Museum visits are rare because it costs money.

M. Hansen initiated a small bird project with a few different activities, such as writing and talking about birds. Nature school visit became a part of it. The teacher is enthusiastic, and he takes his class regularly out to nature, for example to collect leaves in the fall. He discusses with his class, while walking, why leaves change color and fall in the autumn. Then they examine collected leaves under a microscope in a classroom.

Drawing stuffed birds in pencil at M. Hansen's drawing lesson in the same class was just a drawing exercise to learn to see details of a bird's body. They also drew their own hands.

This lesson or theme also had elements of nature & technique, as pupils had to talk about the birds they were drawing.

The Baunebjerg School is a member of the Green Flag Club³⁸ and has got money from the municipality for conserving electricity and water. The school bought flower seeds and onions and gave them to children to plant the flowers in the "green" garden of the school (Elin Landerslev, p.7).

7. How do public schools and nature schools talk to each other?

Institutional links.

Visit to a nature school is not a part of curriculum, but a free option. Usually administration of a public school has a positive attitude for nature schools and encourages its teachers to use nature schools. It is always teacher's own initiative to make an arrangement with a nature school, and a teacher is free to do so.

Nature schools keep good contact with the public schools they serve (usually public schools within the same municipality). They also adjust their sessions to the level of each public school grade. Nature interpreters are well aware of the knowledge children are supposed to have in each grade, and of what they are interested in in each age group.

Nature interpretation themes are designed to match levels of each grade and to meet the interests of children. This integrating approach leads to well suited efficient and educative sessions.

Children always show a lot of interest in what nature interpreters have to say.

³⁸ Certification for public schools in Denmark with high environmental standards in education and consumption

By the time pupils reach the last grade, they have been to a nature school nine or ten times, and went through most of the themes they offer at a nature school.

It can be difficult to get an arrangement with a nature school for the desired time and theme. Nature schools are always fully booked in a matter of days in the beginning of May, when most nature schools start taking bookings for the coming academic year. Usually schoolteachers agree to the appointments and themes they can get, which is not always what they want and what their classes need.

Visits to a nature school are not a requirement, although they are planned for each class every year.

Teachers can choose a nature school, but they are also free to choose another place to go to for a field trip.

A teacher can cancel a trip to a nature school if he/she thinks that it does not meet needs of a class.

A nature school can accommodate one class, on average, only with one session per year. This is what is expected from a nature school, and such a visit is a part of a year plan for each class. Despite the overwhelmingly positive attitude and evaluation of the nature school education by most schoolteachers who use nature schools regularly, some teachers say that it does not make any significant impact on children's education.

A teacher takes a class to a nature school only once a year, and he /she cannot do much about one session. This fact undermines competitiveness of nature schools against other field trip options, such as a zoo, for example. According to K. Olsen, a visit to a zoo, as a one-time event, might be more interesting for children, as they can see exotic animals there. A promise of a fox site does not tempt them too much. Since visit to a Zoo costs some money, a nature school is the second best choice (K.Olsen, p.7).

If nature schools offered more possibilities to come in, pupils would get more out of this nature education. It is a wish from the teachers to have a better dialogue with the nature school for better cooperation and better education (K.Olsen, p.7)

Referring to the difference in attitudes of school teachers for a nature school session as a one time event, it seems that some teachers lay weight on nature education for supplementing their subject, and others consider learning about nature, as such, and connecting with it

equally important for children. There seem to be two kinds of expectations from schoolteachers: some want a nature school session to be scientifically focused and informative, while others give space for emotional, social, and sensual experiences.

The main idea of nature school education is to create interest in nature and to show children how they can interact with it and use it. How nature schools approach this task, and how schoolteachers perceive this approach and cooperate with nature schools is a central research question, which we attempt to answer through the empirical interview data presented above in this chapter.

8. Final Statement of Analysis

In the introduction to this project we have explained how we selected our cases. We draw our reader's attention to selection criteria again in this chapter in order to justify conclusions from the above narrative analysis.

In order to ensure consistent empirical data we were looking for schoolteachers who are 'known' by nature schools to be active and interested in nature education of their classes. The six case studies selected are then considered "best practice" in terms of our small project and our limited overview of the nature school education.

In answering the first analytical question about possibilities of improving cooperation between nature schools and public schools, we draw conclusions from "best practice", which is meant to demonstrate what the conditions for successful cooperation are, and how the cooperation works. We also attempt to reveal, where possible, the hidden potential for enhancing already successful cooperation. The idea behind these findings is to stimulate improvement in cooperation where it is still under desirable level, and where the potential for nature education and consciousness raising is not fully realized.

1) What are the possibilities to improve cooperation between nature schools and public schools?

In answering the second analytical question about the difficulties for improving cooperation between nature schools and public schools, we again draw our conclusions from "best practice", because, similarly to answering the first analytical question, in order to be able to

find valid difficulties, we need to research cases where reasonable amount of activity takes place. In cases of “worst practice” we fear to have found difficulties of another kind, not specific enough, for our research. For example, it is an obvious difficulty if a schoolteacher does not give any importance to nature education, or if a teacher is overloaded with work, and simply has no resources to consider nature education. This kind of basic problems would not lead our research to difficulties specific for cooperation between the two institutions, for the cooperation has to be there already.

2) What are the difficulties in cooperation between nature schools and public schools?

On the part of nature schools, they make an attractive offer to public school teachers, as discussed in the narrative above. They are flexible in adjusting to public school curriculum, as well as to needs of individual classes. In other words, they seem to be open to cooperation and easily accessible. Nature schools successfully create such reputation, and they are, in fact, popular beyond their ability to satisfy the response they get from public schools. What seems to be missing in the big picture about the success of nature schools is how to satisfy the demand from public schools for more openings. A few nature schools, such as the Raadvad nature school, actively look for solutions to this question. As discussed above in the narrative, they educate public school teachers to perform nature interpretation independently from a nature school. We must recognize though, that the Raadvad nature school receives rather generous financial support from its municipality, compared to nature schools in other municipalities, and therefore is more resourceful to develop and implement new methods and models of nature interpretation for public schools.

It became obvious in the beginning of our empirical research, that many nature schools do not fully realize their potential in terms of opening hours. For example, the Vestskovens nature school, is open for school classes only for morning sessions from 09.00 a.m. till 13.00 p.m. The rest of the time the school facilities stand idle. We were, of course, not the first to take notice of this fact. Explanation came from discussions with the nature school leader and other nature interpreters. It turns out that building a nature school and running it are two completely unrelated things. Funds for constructing a school come from one source – a municipality. Municipality lends the school out to the State Nature and Forest Agency, who then runs the school, and pays wages of the nature school staff.

It costs, on average, one million Danish kroner to build a nature school, according to the estimated figures we got from the discussions. But it also costs few hundred thousand kroner

per year to run a nature school. In the end it turns out that with the construction of the school the costs are far from being over, and they rather build up. The main part of the costs of running a nature school is wages of nature interpreters and forest rangers. This can be a reason why many nature schools stand idle many hours every day, when they can still be used for nature interpretation for school children.

However, we are not sure if public school teachers would like to take their classes on a visit to a nature schools in afternoon or evening hours. There could be a few restraints, such as, a public school teacher then should be ready to do overtime work, the school should be willing to pay the teacher for working overtime, pupils should be able to stay away from their homes for a long day, and their parents should be able to pick them up in unusual time. These practical details can be worked out, if there is an offer from a nature school. Or should a public school come up with such offer by itself? Would not this step take the cooperation to a new turn, when a public school makes an effort to expand its nature education, instead of accepting what is already on tailor-made offer from a nature school?

The fact that public school teachers are so responsive to a nature school offer does show that public school teachers are active in cooperation, and that they are interested in nature school education. But what it also indicates is that the convenience of the offer can often be a decisive motivating factor. Convenience in itself is of course, a positive thing, which facilitates and encourages cooperation. It is not clear, however, if teachers choose to go to a nature school because convenient nature school offers allow them to stay passive and give way to a nature interpreter. Nature interpreter leads a session and appears to be in charge. Nature interpreter is a host at a nature school, he/she designs and organises a session. It is his/her job and responsibility. A public school teacher can choose to be involved in the design, preparation and follow up of a session, or he/she can choose to limit the visit to a nature school to the actual time and space of the visit.

Our empirical data from interviews with schoolteachers and nature interpreters shows that some schoolteachers are more active than others. Some teachers when booking a session with a nature school have a special interest in a specific theme; they come with their suggestions and look for a tailor made session designed in collaboration with a nature interpreter. Some would pick a theme from the nature schools portfolio, and others would go for anything a nature interpreter suggests.

The nature interpreters we have talked to say it is quite often that they have to suggest a theme to a public school teacher, and those are the teachers that pay little interest to what goes on during a session. As one nature interpreter at Radar suggested, this is often the case with so called flexible schools. Teachers there take common decisions about curriculum and activities for one class, and they share responsibilities. When one of the teachers suggests a trip to a nature school, because he/she thinks it is important and useful, the other teacher who is assigned the responsibility of taking the class to a nature school might not share the enthusiasm of the first teacher. There are possibly other reasons for a passive or indifferent attitude, such as being overloaded with work, lack of support from school management, personal views. One more reason, already discussed in the narrative, can be that those teachers, who get N&T as their second subject and do not have education for it, are insecure to chose a theme and rather rely on a nature interpreter's suggestions.

Talking about how active schoolteachers are in cooperating with nature schools, how they prepare children for a visit to a nature school, and how they work with it later on at their home school, it is rather obvious in the light of our empirical findings that it is up to a school teacher to respond to an open offer from a nature school and get involved in a dialogue.

This does not mean, however, that all nature schools perform at their best, and that the public school teachers do not. In our few cases, we must admit, both nature interpreters and schoolteachers did a great job, each in their individual way. Their 'stories' revealed both patterns common for most cases, and interesting specifics that made their stories individual and personal. Rich in content and personal attitude, their interviews gave a lot of material to reflect upon and look for implicit meanings. In this project we hope to have found some answers, which were not lying right on the surface.

It appears to be a general pattern, that nature schools are out there ready to offer what ever they can, and school teachers are being whether pre-occupied with their own work, or selective, or responsive, or pro-active. It would have been a great challenge and interesting research to investigate this conclusion deeper than we discuss in this paper. Regretfully, we are not able to do this within the present project due to time constraints.

But we assume that school teachers, on average, face more challenges in their daily work at school than nature interpreters, not in terms of working hours, but in terms of variety of activities they have to direct and supervise during a day with one or more classes. And therefore, perhaps, response from schoolteachers to nature schools varies to a greater degree

than does the readiness of nature schools to do what they are expected of. Greater variations in responsiveness from public schools can also be explained by the fact that there are much more public schools than there are nature schools.

Provided the above assumption is true, low, passive or varied response from schoolteachers is then justified. What can be done to help schoolteachers to find their way to a nature school? There can be many answers to this broad question. But we will look for answers, which come from within the problematique of cooperation.

Nature schools claim to be overloaded with work. Does it mean nature school staff is overloaded with work? Many of them are employed part time at a nature school, although they might be employed elsewhere as well. It is an interesting discourse we would like to continue, but it is hard for us to be objective and consistent as we lack background and knowledge of the formal and informal institutions of nature interpretation service and nature schools.

Our impression is that a little more effort from nature schools towards encouraging and helping schoolteachers to find their place and role in this cooperation could have made a difference.

The first and foremost, in the beginning stage of negotiating a theme of a session, a teacher would perhaps, be encouraged to prepare pupils for it, if she was given advice on how to do that, unless she already does that, and also emphasised how important it is for success of the nature education. Then follow up on the preparations to a session could be a reminder and stimulation to teachers to take action. From the interviews with nature interpreters, we know that they give advice to school teachers about how to prepare for and follow up a nature school session, but it seems not to be done as a common procedure, and not at all nature schools. Nature interpreters realize the importance of such procedures, but claim to not have enough resources to go that far in taking care of all the circumstances around a nature school education for school children.

Importance of tactile methods of teaching is recognised by both nature interpreters and public school teachers. As it appears from the interviews with teachers in N&T, all of them think that theoretical public school education needs practical back up. Some of them do a lot of experiments and fieldwork, other do less. The reasons for being more or less involved in experimental and fieldwork can be unrelated to teacher's motivation and competence. It can

be related to other factors, such as, availability of nature areas in the vicinity of a school, flexibility of school curriculum management, heavy theoretical work load which does not allow for extra activities, and so on. Some teachers, as already mentioned above, are skeptical about educational value of one-time outdoor events, and prefer to maintain continuity of their classroom work.

There is almost no criticism of nature schools from public school teachers. The only wish from teachers is to come to a nature school more often than it is possible for a nature school. There is a strong belief among schoolteachers into the “goodness” of nature schools and there is a strong demand for nature experiences. The strong belief can be explained by the strong demand, which is not fully satisfied.

Is the importance given to nature school education justified? The answer to this question seems to lie in the realm of belief and norms, and it can only be justified by those norms. The society believes that the more children are in touch with nature, the healthier and happier people they become.

Are teachers so positive because nature schools are really great or because the demand for them is so high? Do nature schools supplement theoretical education? Do they build new kind of knowledge, based on tacit knowing?

All interviews say “yes”, but with various degree of optimism, depending on how much nature education children are exposed to. There also seems to be strategies of applying hands-on experiences in nature. For example, M. Brandt told us how she uses it in the initial stage of a learning process, when children first get tacit experience and then build up theoretical knowledge. Other examples show how teachers apply ‘hands-on’ experience as a practical illustration to an already introduced theory.

K.Olsen says that the nature school education is not effective, if it is discontinued. However, he believes that if nature schools can provide continued education, it would serve its purpose.

K.Olsen has, in fact, formulated the problem, which is the focus of our research. Interview with Kim was taken a few months after we had found our research focus from interviews with nature interpreters.

Our assumption was that, as also suggested by K.Olsen, nature schools have little impact on environmental awareness raising, unless their education is maintained in continuity.

Our further observations and research, have shown that such continuity can be achieved when nature schools and public school teachers work together in finding flexible solutions adjusted to needs and interest of an individual class (“best practice” examples).

Chapter 6. Conclusions

In the beginning of the research, we were interested in evaluating effects of NI on environmental awareness of school children. Then, in the course of investigation, our focus kept changing, first to the methodology, and eventually to the issues of cooperation. We have picked up the research focus problem from the interview with Tine Mono, who used to work as a freelance nature interpreter at the Vestskovens nature school in May 2003, when we began our research. She was, in fact, the first nature interpreter interviewed for the project, and we are grateful to her for her interesting and inspiring story and guidelines.

It was quite clear rather early from the nature of the problem under investigation, that this is a qualitative research, which would be best suited with an interview as a research method. It is an exploratory study of few cases, which aims at finding the limit of how much and what can be done to improve cooperation between nature schools and public schools for environmental education.

In order to give a historical and conceptual context of NI, in the second chapter we give an account of Interpretation by F.Tilden, who was the first to formulate the principles of Interpretation. His book “Interpreting our Heritage” written in 1970s is still referred to as the “Bible” of Interpretation. The working principles of the Danish Nature Interpretation Service are very close to those formulated by Tilden. The difference we find between the two accounts is rather practical. Tilden’s book is about Interpretation in general; its subject can be not only nature, but also other vistas of beauty, like cultural and urban landscape, or even art. It is a captivating story-telling approach, where visitor’s imagination is actively involved in constructing his own conception and artistic personal reflection upon the feelings stimulated by interpretation.

The Danish NI Service is ‘down to earth’, oriented to specific details of a landscape. Under the influence from AC approach through public schools, Danish NI for children is also science- and action oriented.

In the thirds chapter we give an account of the Danish NI service, as it is today, its organization, funding, education system, institutional links with public schools. Nature schools are a part of the Danish Nature Interpretation Service network, they are run by the Nature and Forest Agency of the Ministry of Environment, and are set up as an institution to

supplement public school education with a practical experience and overview about nature and relationship between nature and society. The Ministry of Education supplies nature schools with the public school curriculum, and they design their activities for specific needs of each public school grade. They advertise their offers for public schools on the web and by distributing printed material to schools. Nature schools do a fairly good job in implementing nature interpretation, in adjusting it to the public schools and in making themselves heard. They are located in nature areas, and are supplied with tools and materials to perform nature interpretation for school children. Qualified guides, who are whether employed by the Nature and Forest Agency or work freelance, do nature interpretation.

Public schools are not obliged to use nature schools, but they plan a certain number of field trips every year, and nature schools are often a recommended and a favorite option. However, it is a teacher's free choice to take a class to a nature school, and therefore it was interesting to look at their motivation to do so.

In the forth chapter we introduced theoretical positions from which we discuss NI and its role in environmental education. Relation of man and nature, conventional anthropocentric paradigm of knowledge are discussed in comparison to empathetic ecological approach to education. Discussion goes on into comparing values of deep ecology and Interpretation by Tilden. Interpretation by Tilden resembles deep ecology in many aspects, especially in the view of man and nature as being inseparable.

Action Competence being in the center of pedagogical debate and being a dominant research field in environmental education methods, is interesting, as it has influence on pedagogic practice in public schools. AC is not a part of official pedagogic strategy of public schools, but its elements appear to have integrated into it, according to our observations and interviews. The methodological approach commonly adopted by public school is called "Responsibility for own learning". Every teacher knows this formulation, but the few teachers we have asked to explain the meaning and status of this approach, could explain the meaning, but could not refer to any specific source. The idea is to encourage independent thinking, and competent decision-making and action in young people. It is done by giving them temporal and methodological freedom to solve practical tasks and problems in education process. This appears to be an element of Action Competence approach.

On top of discussing AC as a cognitive instrumental approach to EE, we give an account of tacit knowing, as a theory explaining the hidden mechanisms at work in experiential learning.

It is essential to explain why are hands-on methods important, how are they different and how do they work. The theory of tacit knowledge explains construction of all knowledge and relates to AC, NI, deep ecology and conventional knowledge paradigm as parts of this construction. It emphasizes that all knowledge is rooted in tacit knowledge, and thereby strengthens the position of experiential methods in EE.

What is interesting about the Danish NI is the integration of elements of AC approach into the traditional story telling form of NI. This integration results in a variety of forms nature schools perform their educational work. Variations to traditional story telling form depend on aims and focus of a specific theme. Themes with a scientific experimental focus are strongly dominated by elements of AC approach, as illustrated in the Theoretical chapter (soil tour at Raadvad nature school). Themes linked to cultural events and myths, such as Christmas tour at Taarnby nature school (see Theoretical chapter), are performed in the spirit of the traditional interpretation, where re-creating a cultural myth about man and nature is a way to unite young minds with nature.

From Theoretical chapter we carry on with analysis of the interviews with public school teachers. It has been a methodological challenge to approach analysis. Since our empirical data consists of six qualitative interviews, narrative approach appeared to be the most suitable for analytical interpretation, as each interview became a story of the teacher's relation to a nature school and NI. We have attempted to answer our research questions in the light of the stories from the teachers, and we concluded the analysis with answering the question about possibilities and difficulties of improving cooperation between nature school and public school.

Cooperation for a more efficient use of nature schools for environmental education could be improved if

- 1) nature schools offer extra supervision and support in preparation for and follow up of nature school sessions to those public school teachers who need it; and if public school teachers are responsive to efforts and offers of nature schools;
- 2) if nature schools provide more sessions to an individual class per year to ensure continuity and re-enforcement of nature education;

In order to fulfill the two above conditions nature schools would require more manpower, which means more financial resources. However, the situation could be helped if

- 3) nature schools educate public school teachers to perform nature interpretation independently within and outside nature school facilities, as they do it at the Raadvad nature school;
- 4) if public school teachers integrate nature schools into their thematic projects whenever possible.

Project related cooperation and education of public school teachers for NI seems to strengthen connection and mutual commitments between the two institutions. In a project situation both parties are motivated to compromise, find flexible solutions and additional resources for their implementation.

From the methodological point of view, it is essential that nature schools apply methodology that public school teachers can recognize and relate to. AC approach is being partly integrated both at public and at nature schools. The ‘hands-on’ method which is the main method of nature schools, is used by teachers of N&T, drawing, and other subjects, whenever possible in a classroom environment.

In chapter 4 we discussed two theoretical positions related to environmental education *for* nature. One position is marked by AC approach as a cognitive approach to action for and knowledge about nature, another position is marked by NI, as an artistic, sensual approach to action and knowledge about nature. How do AC and NI relate to the ‘hands-on’ method of nature schools?

This method can be related to from both positions. It is the theme and content of a session that determines theoretical reference of the method. In fact, it has both NI and AC relevance in most cases, with a stronger emphasis on one of the positions. In the case of the soil session at the Raadvad nature school the ‘hands-on’ method appears to be an AC element within NI of a scientific kind. In the cases of the aquarelle session in Raadvad and the Christmas tour in Taarnby the method is applied in the context of NI of an artistic kind.

Elements of AC are obviously applicable to scientific NI with cognitive instrumental approach to nature. The artistic kind of NI is rather close to the traditional Interpretation by Tilden.

What goes on in public schools and nature schools from the perspectives of AC and NI?

One is practical instrumental approach, oriented at specific problem solving, and involvement through problem solving tasks, with the aim of motivating attitudinal change.

The other is seductive, mythological story telling, with holistic approach to nature and man/nature relationship. Its aim is are shaping a concept of nature as a system we are born to and are an inseparable part of, in a way, re-constructing the man/nature cosmology in a holistic ecological perspective. It is a motivation for change, but on a different scale. AC approach propagates change because it is necessary for our own survival, if we take care of our environment, we will ensure a better future for our children. Traditional NI, however, aims at rather philosophical conceptualisation of nature through sensual, cultural and spiritual perception of its intrinsic value. NI ultimately aims at shaping a worldview where man and nature are interrelated in many aspects, material, intellectual, and spiritual.

The pedagogic strategy of public schools called “Responsibility for own learning” determines methods of teaching, which reflect AC approach, or at least its influence. It is a general strategy applicable to all subjects. Subjects with more practical experimental content, such as N&T and drawing, accommodate elements of AC approach in an explicit fashion, as described in the interview material (appendix: A. Blom, M. Hansen).

Nature schools are free to choose their methods, but they are influenced by the pedagogic practice and strategy of public schools. There are visible elements of AC approach at work in nature school sessions of a scientific kind. Talking about this kind of sessions, they seem to be a suitable and effective supplement to the classroom work. The fact that children experience the same methods at a nature school, as they are used to in their own school seems to maintain continuity of a theme in subject, it provides a smooth transfer from their class room to an open environment of a nature school. A nature school is by definition a place to apply practical experiential methods, and “Responsibility for own learning” approach with elements of AC is appropriate for such education.

NI at nature schools seems to be a broad concept, which contains both cognitive-instrumental and cultural-ecological approaches. It is broader than Interpretation by Tilden, which is more artistic and eco-centric in its essence, and thereby more philosophical and less focus specific. NI at nature schools is an advanced version of NI as such, or even of Interpretation by Tilden. It has developed into a flexible pedagogic method in alternative EE, aiming at adjusting to and supplementing public school education.

The Danish debate in pedagogics is about children’s every day life experiences as an important aspect of education process. It is an important aspect for the discussion about integration of nature experiences into formal education. One perspective for further research

is to investigate if NI considers children's everyday experiences and how integration of these experiences into NI changes children's conception of nature.

Another perspective not realized in this project is to take a critical position towards AC approach in terms of its effectiveness as an alternative action-oriented EE. Principles and targets of AC could have been tested on our empirical observations of nature school sessions.

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Nature education for public schools

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Environmental education portal of the Ministry of Environment

<http://www.muu.dk>

The Danish Rangers' Association

<http://www.natur-vejleder.dk/english/association.htm>

The United Nations Environmental Programme

<http://www.unep.org>

The United Nations, Agenda 21

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The Green Flag for the Danish public schools

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Appendices

Appendix I. Interview guide

Background

This Interview is being done for the purpose of field data collection as part of my master course project under the theme: Bridging public schools with nature schools in Denmark. My preliminary research into the theme has unveiled that there are different levels of cooperation between public and nature schools. Most nature schools possess an adequate arsenal of staff, knowledge, equipment and methodology in nature interpretation for children, and provide effective nature education for children. Nature schools goal is to supplement formal education at public schools with practical experiences in nature, as well as to extend the limits of formal education. However, education at nature schools is limited to single sessions for an individual class. My interest is to investigate how public schools promote and extend nature education received at nature schools into their curriculum and subject teaching. The research question is "How to enhance educational gains from nature schools?"

This is an independent research, not for any organisation or institution, but just for my university course project.

Personal Profile of an Interviewee:

Name.....

Organisation.....

Position.....

Date.....

Suggested questions.

1. Introduction. The role of a nature school in your public school education.

I have observed a session at a nature school with your class.

Can you tell **why did you want to take the children to this trip?**

- Is this theme a part of the class curriculum?
- Is it a part of a current project at your school?
- Is it an isolated event to introduce children to a new experience and knowledge, which is not directly related to their curriculum?

Can you tell **what did you do about this theme before you came to visit a nature school with your class?**

Pedagogic roles

2. I have observed a session at a nature school/natural area with your class(es).

Can you please tell me **if you have returned to this theme in your subject teaching or on other occasions?**

If yes, where, when and in which connection you have returned to this theme?

- a) soon after the visit to a nature school/natural area (for ex., within 1-3 weeks)
- b) in a classroom lesson of Danish, maths, art, etc.
- c) in connection with a thematic project at home school, for ex. at a nature camp, landscape theme, etc.

3.

a) Could you please describe with more details what was the **plan for the lesson(s) on the theme?**

b) How did the **discussion go?**

- What was important to the children from the trip to a nature school/natural area?
- Were they interested in discussing, reflecting and learning more on the theme and related themes?
- How did they express their interest / attitude?

4. Methodology

What is your opinion about the pedagogic practice at nature schools?

How does it match with your own pedagogic practice?

Institutional roles

5.

- a) what is the motivation for the school and for teachers to cooperate with a nature school?
- b) how do you think a nature school/a trip to nature supplement your subject?
- c) Are there better alternatives for a field trip / nature education?
- d) Does your school encourage teachers to take full advantage of a nature school/nature interpretation?

6.

- a) what are the useful tools a nature school provides to you as a public school teacher?
- b) If not, what could a nature school staff do to be a useful supplement to the public school curriculum?

School subjects: N&T, drawing
Nærum School
Nature school session theme: fishing (May 2003)
Nature interpreter: Jacob Jensen

1. What is public school teacher's motivation to take a class to a nature school?

1. Help to teachers in natural sciences, or nature and techniques subject

"You can not have experts on every subject. We do not have many teachers, so the knowledge is diverse. So some teachers have to take subjects they do not like. I think it is good that the teachers can go to the nature school then and get inspiration to do things they would not come up with themselves."

2. Team of teachers decides about a common theme

"So we, a team of teachers, can come up with a combined thing. So the big subject is something we agree on together, fishing, for example". Then they look for such a theme among the nature school offers. "But you can hardly ever get down there. We did not get anything this year, because it is booked."

3. Teachers believe in importance of tactile methods for initiating interest and learning

"Personally because I think it is great and I like to get "hands on" as well. And as a teacher, because I think it is a good way to start an interest and some sort of align of teaching or subject and it is a good way to learn things."

4. Attractive offer: Nature school offers education sessions, which are

- Organised by nature school
- free of charge.
- Reliable quality
- Child-oriented methods of teaching

"I choose it because it is close and cheap and it is good education. I also know what I get. Sometimes you do not know what you get, in a museum, for example." Guide's personality can make a big difference. In a museum a guide might not be very good at talking to children.

2. How do public school teachers integrate children's experience from a nature school into their subject teaching?

Public School Subjects: Art, Nature & Technique

1. Nature school provides experiences in the nature that public school teachers cannot provide:

- nature school guides know well the surrounding nature
- special educational tools/equipment for nature education

- effective educational methods: nature school guides “speak to children in their language”

“We had a joined experience/they can remember it/at nature school they have many things we do not have/they have the nature around and they use it better than we do/the way they teach is very educational and they speak to the children in their language/it is something that children instinctively are interested in”

3. How are nature school sessions integrated into in thematic projects at public schools?

4. What kind of learning motivation factors do pupils find in the nature?

1. Positive experience from activities in the nature motivates children to do that again.
They learnt how to fish, and were rewarded by getting good catches.

“I think they thought it was great/and many of them wanted to try going fishing on their own”

5. Is there any influence from nature schools on pedagogic practice in public school? How different or similar are their practices?

1. Teacher lets children have practical experience of the subject before introducing theory.

- This is a good motivation for young children, especially for boys
- With older children it can be the other way around
- With mechanical objects short theoretical introduction precedes experiments
- Boys and girls need different methods, boys are more into experimenting prior to any theory
- Nature education calls for experiential methods: “In my opinion, they show a different way of teaching that you do not have to read ten pages before you can answer any question. [...] We inspire them to read maybe later”
- Nature school backs up theoretical knowledge with experiential knowledge
- Public school teacher (Mette) uses methods very much similar to those seen in nature school (start with short theoretical intro+demonstration, then go to experiments), but public school often lacks resources to perform the same education as at a nature school (forest nearby, tools, expertise in certain areas of natural science)
- Pedagogical strategy in Danish public schools is about work form; it changes with every new government and is open to interpretation

“I do not think there is a philosophy – but I think in the last few years it is about the whole person and we have to find out how this child learn and then stimulate them in the way they are most receptive to/whether they are musical, physical, verbal etc”

Experimenting takes a form of a game or a puzzle they have to try to solve on their own.

“When you look at the **subject natur og teknik** one of the main purposes is to do experiments and to get the interest in that way. I look at as a subject that is about setting

things up and then let them find out/instead of me telling them/it is a way to get knowledge/so I have to plan the structure and maybe they will break the structure and that is fine/I inspire them”

6. What do public school teachers do for nature education independently from nature schools?

In geography and physics it is possible to do many practical exercises in a schoolyard. While biology needs most “hands on” experience. Mette takes her classes on a tour once in a while. Museum visits are rare because it costs money.

1. Pond trip. Mette has done a trip to a pond many times, when children collected baby frogs or their eggs and made an aquarium. The frogs are set free when they are bigger.
2. Plant trip: “We just went on a plant trip/took the bicycles for a whole day and picked plants.”

7. How do public schools and nature schools talk to each other? Institutional links.

1. How to get on a tour.

This is how it usually works.

We, teachers wanted to go for a fishing tour. But it is difficult to get an appointment with the nature school. “We did not get anything this year, because it is booked”

“We got the pamphlet in May on a Friday and we called on the following Monday and everything was sold out. There were four classes on this school that had the chance this year so that is not very much.”

Raadvad nature school offers special training to public school teachers so that they are able to provide NI to their children independently. Mette, however, does not have an experience of consulting from a nature school or courses for public school teachers: “It is not difficult to read up on special subjects, it is not a difficult material. What is difficult is how to get it out to the children.”

2. Nature schools and curriculum

A nature school “is not a part of curriculum but it is chance to get a good experience.”

It is neither a requirement by law or school administration. “It is up to the team around the class to decide”. School administration has a positive attitude towards the field trips and nature education, and it does not interfere unless a trip costs some money.

3. Wishes and recommendations for nature schools from public school teachers

“More openings!”

For a teacher in nature & techniques, who besides biology has to take care of geography and other natural science subjects, ‘it would be sufficient with one or two times a year. But it would be great for us, being so close, that we could go there on a regular basis. Say, once a month. That would be great for the kids because I think it is not good for the kids being locked up in a classroom all the time.’ On the other hand, the teacher is not sure if she could give up so many hours from other subjects, like geography, in order to go to a nature school as often as every month. She says, it is hypothetical, but possible, if her schedule was

arranged in a “flexible” way, referring to *flexible school*, which is a system of cooperation between teachers working with the same class. According to this system, teachers can exchange working hours, assist each other in certain grades and certain themes, etc. They are free to work their common schedule. Mette indicates that flexible schools become more and more popular, and that her school is going to be more ‘flexible’ in the near future as well.

Methodology of analysis

The theme questions are approximated to interview questions and research questions; they aim at answering my problem formulation through my empirical data.

I will look for answers to the theme questions from all my interviews, and then merge answers from all interviews under each question in a condensed format. Thus, the analysis will result in collective answers of the teachers’ interviews to the theme questions.

The segmentation of each interview by themes (as above) will not be a part of the analysis chapter text. However, interview transcripts will be in appendix.

School subjects: N&T, maths, and housekeeping
School & Class: Nærum School, 5th grade
Theme: Soil (October 2003)
Nature Interpreter: Karen Vesterager

1. What is public school teacher's motivation to take a class to a nature school?

1. Nature and Environmental education

“It is obvious that children learn a lot about the nature and the environment.”

2. Expertise in natural science

“I think it is important some experts work with the children, like biologists”.

“And it is good for the children too to have other input, than I can give them”.

3. Help to public school teachers in nature & techniques

“And I learn many things as well. I am not a biologist, although I teach Nature and Techniques. I am self-educated in a few special courses, but it was not among my subjects in the Pedagogic Seminarium”. “Those courses provided enough knowledge to teach my classes in Nature and Techniques. But still, a nature school can give a better view and understanding to children, because they are experts.”

“Natur og teknik” is the subject, which you will get if you teach mathematics. And many of the teachers do not want it. But they have to take it, they are forced to. If these teachers can take their classes to a nature school they would think the biology part is done, and they do not have to worry about it then. It is better than nothing. Without appropriate qualification, they do not know what to do in this subject. But when they visit a nature school they become more knowledgeable and more able to teach. In this perspective, visits to a nature school help not only children, but teachers as well.”

2. How do public school teachers integrate children's experience from a nature school into their subject teaching?

Public School Subjects:

Natur og Teknik, Hjemmekundskab, Matematik

1. Nature school is primarily useful in teaching nature & techniques.

“I teach math and nature & techniques. The latter consist of biology, physics and geography. There is a consideration that a nature school is primarily useful in teaching “natur og teknik” and art (billedkunst). It is quite new for art though.”

2. Housekeeping is another subject that has an interest in a nature school.

“Housekeeping has some courses about wild ducks, about berries from the wood that you gather and make marmalade from (in Danish “hjemmekundskab”). Hjemmekundskab is about cooking, cleaning and ironing. Everything that you have to do at home.”

3. Nature school can be used to teach drawing nature. Art/drawing (Billedkunst)

“The purpose of the aquarelle session was to open children’s eyes to different forms of nature. The children enjoyed it. “ It was supposed to give them an artistic view of the same landscape that they have been looking at through a microscope.

3. How are nature school sessions integrated into in thematic projects at public schools?

1. Nature school gives public school teachers inspiration for field trips and projects.

“We also use the nature school to inspire the teachers to make some projects. We learn from the nature school practice, and then we (public school teachers) can bring the children to different places in the wood without help from a nature school.”

‘Green weeks’ held in the last two years in cooperation with a nature school, have opened eyes of many teachers on the nature school.

2. Landscape Theme

Planned for 7 school days and it is organised as a “flexible week”

a. reading a book about landscape.

b. watching videos on the Net with some scientist who talked about Ice age.

c. Geological Museum, where children had a lecture on landscape formation, and where they could touch the stones that they saw on the videos.

d. Zoo

e. Experiments in a classroom. They learned about acidity levels, PH-values, because of the chalk in the Danish ground. They made experiments with HCL-acid; it is a very strong acid. We tested different stones to see if they contained chalk The purpose of the experiment was to find chalk. Chalk neutralizes the acid. We made a little pond with water and then they put acid in it and measured the PH-value. Then children put chalk into the water, and then we saw that it the acid was neutralized.

f. Discussion following the experiments. We discussed these aspects of having chalk in the ground water. We looked at what happens in the different lakes in Denmark and Sweden.

We also conducted several experiments with different kinds of stones: Flint and chalk.

g. Experiments with clay and sand and soil in the refrigerator (what was influence of the Ice age)

h. Soil tour at Raadvad nature school

“In the first day we investigated the soil to see the different layers. When they were digging samples of stone they did not know much of the different layers of stone, but they knew about the influence of the ice.”

i. Follow up on the soil tour.

“We talked about what we had found out and then we put it down on paper because this was in Raadvad. A few days after the session the children had as homework to try and dig soil samples in different places, for example, in their gardens or in a nearby park.

Then we found that there were much more mould in the soil in their gardens than in Raadvad. And then we talked about that. We discussed in which soil the best carrots would grow, and drew a conclusion from there if the soil was better in Raadvad or in their gardens.”

4. What kind of learning motivation factors do pupils find in the nature?

1. Children are more receptive in the nature

“It is very good, especially for the boys, to be in the woods, to release their energy. They are completely different children when they are in the woods compared to when they are in a classroom.”

2. Children are more social and cooperative in the nature.

“They have to cooperate and solve some problems together, that is very good.

3. Finding practical solutions together is rewarding

“They are more cooperative in this environment, because they have to solve practical problems. It is learning by doing (Naturklasseprojekt).”

Landscape theme.

“Children were very enthusiastic, very interested.

I think they enjoyed painting the most out of all the other activities. They were also very interested in the Geological museum. They liked their own experiments at our school very much, it’s exciting for them to discover new things.”

5. Is there any influence from nature schools on pedagogic practice in public school? How different or similar are their practices?

Soil tour

1. Children are given freedom in finding their solutions and limited guidance.

“So they have learnt something at the nature school. It was hard for them in the beginning, but they got a possibility to try it by themselves and at their own speed. There was no one to interfere.”

2. Follow up activity at home school – the same task on their own.

“They got a bit frustrated because it was difficult for them to dig samples. But after some experimenting, they were quite happy to do it by themselves in the weekend as homework. They were not very happy when I told them to do this homework, but they were proud of the samples they brought next Monday”

3. Planning continuation.

“But next year we will look at maps, and compare them to a landscape, where you can see heights and depths. We will continue talking about different soils and stones, that are found in valleys and on hills, and so on.”

6. What do public school teachers do for nature education independently from nature schools?

1. Teachers conduct many experiments not related to a nature school experience

2. Teachers take their classes to many field trips not related to nature school experience

However, these experiments and field trips may be coinciding and integrated with nature school sessions, as in the example of the landscape theme at Naerum School.

“We did many experiments at our school after the nature school sessions.

I think that interest in experimenting was not specifically stimulated by the visit to the nature school. There were just a few experiments at the nature school, and we did not have enough time then. Most of the experiments were conducted in a classroom.”

7. How do public schools and nature schools talk to each other? Institutional links.

1. Usually administration of a public school has a positive attitude for nature schools and encourages its teachers to use nature schools.
2. It is always teacher's own initiative to make an arrangement with a nature school, and a teacher is free to do so.
3. Nature schools keep good contact with their public schools
4. Teachers are very satisfied with the quality of the nature school sessions, and find them very useful for children and their own subject teaching.

“I think, the sessions the nature school provides and the contact they keep with school teachers is very fine. It is always very useful to use a nature school, even if public school teachers are very knowledgeable in natural sciences.”

Summary

A nature school session was a final part of a Landscape theme, which lasted for seven school days, and consisted of many different activities.

The class teacher has prepared the children by reading material and showing videos about landscape. The class has visited Geological and Zoological museum, where they learnt more about landscape formation, Ice age, and stones and animals of that period. Museums gave them a chance also to see and touch some stones and objects related to the theme.

The class has conducted many experiments in their school, for example, with chalk and acidity levels in ground water, with checking composition of flint, etc...

Every experiment or a field trip was discussed in a classroom. The events of the theme seem to be in a constructive logical sequence, where one activity builds on the experience and knowledge from the previous one.

Children came to the soil session with some knowledge about landscape formation and soil composition, with some experiential and experimental background. They have had certain competence in the theme and certain confidence in experimenting. The new activity, the soil sampling, and experimenting with the samples at the nature school, had a considerable foundation of knowledge to build on.

The last event of the theme was the aquarelle session, when children tried aquarelle colours and techniques in depicting landscape. It was a cardinally different approach to landscape compared to other activities of the theme. Along with acquiring drawing skills, children's task was to use all their senses, including artistic skills and imagination while trying to capture the colors and forms of the landscape.

School subjects:	Drawing and Danish
School & class:	5 th grade, Nærum School
Nature school session theme:	landscape painting, aquarelle
Nature interpreter:	Signe Dinsen (self employed)

1. What is public school teacher's motivation to take a class to a nature school?

1. Nature school offers certain themes. Aquarelle painting was a new offer. The offers are published in brochures or catalogues and distributed to public schools.
2. Teachers are enthusiastic about activities in the nature and they want to give this experience to their class.
3. Mia Liv and Anni Blom, teachers in drawing and nature & techniques accordingly, wanted to combine their subjects in a field trip to a nature school.

“I work with Anni Blom, we have the same classes. And she is very interested in activities in the nature...I thought it would be interesting to mix her and my subjects at the nature school. And so we did. I have three classes, and two of them with Anni.”
4. Nature schools have materials that children can work with. For example, aquarelle, which is expensive, and is not bought by a public school.
“They help because they have this place, they have materials for children, aquarelle. Aquarelle is expensive; it was another consideration for me. We played with water colors, but not with aquarelle.” “They have all the necessary things for their work, so that we don't have to bring anything. It is an easy way to get a good lesson.”
5. Nature schools territory is quite large. Children can play there freely.
“And. it is a large place, quiet, lovely. Children need that”
6. There is a nature guide, an extra teacher, to work with, to talk to, and to take care of children.
“And there was another teacher. We were three teachers, and we could help the children much more.”
“I think I could do the same. I am an art teacher, so I know something about it. But sometimes it is good for the children to go out and to listen to some other grown ups telling about art. I like it when they are going out.”

2. How do public school teachers integrate children's experience from a nature school into their subject teaching?

Public School Subjects:
Billedkunst

1. Follow up can be difficult because often a trip takes place while there is another theme

The teacher did not spend much time on following up the aquarelle trip right after the session, because the class was already in another drawing theme at that time. But they talked about the session anyway and will be talking more later when the drawing are returned from the exhibition at the nature school and are exhibited at the home school (following month).

“It was just an experience and trying some techniques. And then we have to come back to our another drawing competition. And then we will return to the aquarelle drawings at the nature school. It is difficult to find time for everything and to fit the nature school visit into our class work. The nature school is very busy, so we go there whenever they can have us. Sometimes it is in the middle of another thing”

2. Telling other classes about their experience

Teacher and the class will tell other children of the school during the exhibition about their experience at the nature school session, about the colours of nature in different seasons and about the drawing techniques they have tried.

“We will be talking about them in November and tell other children about the paintings, the technique and the experiences.”

“Yes, maybe ...because we are looking at the nature, focusing at this... and the colours of the nature we talked about. They are different in different seasons...”

“I am going to put them up here at school, so that others can look at them and talk about them.”

3. The nature school session was an opportunity to try new techniques and colours (aquarelle) while being in the nature and drawing nature.

- Children learnt on practice the difference between acrylic colours and aquarelle.
- They had to focus on the colours in the nature to distinguish different shades, etc. and discussed it.
- They learnt that the same nature object can change colours in different weather, season, time of the day...Water can be purple if it reflects red leaves in the autumn, and it is black in the rainy day, but ca be blue or green in the sunny day.

“The children liked their experience in the nature very much, we just talked about the techniques and the difference between the acrylic colours and the aquarelle. We talked that trees are green. But what is green? There are many shades of it. And the water tone was purple, black and blue in different paintings. The purpose was the technique and colours of nature.”

- They had to look for a view and perspective they liked. So they were looking for beauty in the landscape and how they would capture it on paper

“And about choosing the picture, the perspective. We will talk about it again when we exhibit the paintings tomorrow.”

3. How are nature school sessions integrated into in thematic projects at public schools?

4. What kind of learning motivation factors do pupils find in the nature?

1. Children like to be outdoors
2. They like to be away from their school

3. They like to be able to move freely with who ever they like
4. They often very interested in a teacher, the nature school guide
5. They are greatly rewarded by the discovering, finding things in the forest, getting a good catch, making artistic things, receiving recognition and positive feedback from a guide and from fellow class mates.
6. In the nature they can focus for longer time than normally in a classroom.

“They always like to be outdoors, and it can be anywhere, even just going out of this house and just doing something... It was kind of a free experience. They could sit wherever they wanted to, with whom they wanted, in quiet place...in a free space. They liked Signe and how she taught them, as well as the positive things she said to them about their paintings. It was good for them to experience another teacher in drawing.

It was quite cold then, and still they did very very well, I think. And they were quite focused. I think they could focus for a bit longer than they do in a classroom

5. Is there any influence from nature schools on pedagogic practice in public school? How different or similar are their practices?

1. Public school teachers do many things in the same way as they do at nature schools.

They recognize the same methods they use at their school.

2. Most nature interpreters at nature schools are not educated to be teachers. Nevertheless, they are usually very pedagogic in their approach to children. Their approach differs to children of different ages, and they have a variety of ways to communicate their subject to them

“I do many things in the same way. I do not think Signe is a teacher by education, but she did very well. She wanted something from the children, not just go out and have fun with watercolours. She actually wanted and hoped they would learn something about drawing techniques. She also does it in different ways. I was at her session with a younger class, and she was able to communicate her knowledge to them in many different ways”.

3. Drawing is a subject, which is taught through a lot of practice, and thereby its methods are very well suited for a nature school session.

“V: So your methodology is very close to the pedagogic practice in a nature school?

T: Yes, absolutely. It could have been my lesson.”

4. Teachers exchange teaching knowledge with nature guides.

“V: Would you like to use some of her methods in your practice?

T: yes. She gave me some papers, and I am definitely going to use some of them. We can help each other. She asks us for some things, and we can help her.”

5. At nature school children are given a lot of freedom in the process of experimenting. This challenge stimulates their creativity and interest in what they do. They are given responsibility for their own actions, and education. Teachers observe them from a distance, with limited advice.

“V: I have observed a few sessions, and I can see that nature interpreters, when giving a task to children, also grant them quite a lot of independence in the way the children can fulfil it.

Children are given little advice, and have to find their own way to complete the task. Therefore they are more active and more creative. I think it can be difficult for some children to control the process. But somehow it works. And it worked in this session too. Signe asked the children to find a spot with a view they wanted to paint. She did not guide them. They had to discover their spot by themselves, trying different places and views.

T: Both children and myself, we liked that they could choose a place they wanted to sit at.

T: yes, they took a walk around to look for places.”

6. What is “responsibility for your own learning”?

“V: I thought it is a theory.

T: But from where? It is not standing anywhere. It is just a modern word. Everybody talks about it, but I don’t know how individual teachers practice it.

It is interesting to know what it actually is. I don’t think it is the same as ...(unclear)”

6. What do public school teachers do for nature education independently from nature schools?

7. How do public schools and nature schools talk to each other? Institutional links.

1. Nature schools are usually very busy, and teachers take any appointments they can get

“The nature school is very busy, so we go there whenever they can have us. Sometimes it is in the middle of another thing”

V: When did you book your tour?

T: Before summer vacation, and they were already almost fully booked.

V: When would you have liked to have this session?

T: In the end of November, but it is cold, you cannot see much ...

2. Teachers are very satisfied with nature school, but would like to have more sessions

“I was very pleased that they had an offer of an art session in the nature.”

Summary

A nature school session was a final part of a Landscape theme, which lasted for seven school days, and consisted of many different activities.

An aquarelle tour was planned together with Anni Blom, the teacher in nature and technique. The teachers thought it to be interesting to combine the two subjects (art and nature and techniques). Mia saw the offer of an aquarelle session in the nature school’s catalogue, which is sent to the Naerum School. It was not possible to get a booking at the desired time, but they had to agree to the available time.

The class went down to a small lake very close to the nature school and every child was asked to find a spot from where he could see his/her “picture”. Before that Signe, the nature interpreter, held a half an hour-long discussion about what they were going to do, and what techniques could be used in aquarelle drawing. She explained how to see a landscape in

perspective and how to measure and depict distances between objects in a drawing. This introduction was very basic, comprehensible and very useful. It was given at the level these young children could understand.

The class did not have to bring anything with them for drawing. The nature school provided aquarelle and other tools.

Every child found his or her spot and kept drawing for quite a long time, maintaining concentration longer than they usually do. Signe was following up with the pupils on their advances and helping with advice. Everyone had to make two drawings: the trial and the final. She put the drawings up on the wall in the nature school classroom and has commented on each drawing with very creative and encouraging words.

At the time when the session took place the class was in another drawing competition. But Mia talked to the class about the session: the colours they saw in the nature, drawing techniques and how to mix colours.

The nature school held an open day for children and their parents to visit the exhibition. After that the paintings are returned to Naerum School and will be exhibited there. Mia will return to the drawings and the session on a special occasion when the class will present their art to the other pupils of the school and speak about their experience.

Mia thinks that it was very good for the children to have this session. Everyone enjoyed it a lot.

The session was very close methodologically to what Mia does in her work. Signe and Mia exchange their knowledge and cooperate.

School subjects:	N&T, mathematics
School & class:	Birkelundskole
Nature school theme:	Nature Right Now or Signs of Spring (May 2003)
Nature interpreter:	Tina Mono

1. What is public school teacher's motivation to take a class to a nature school?

1. The teacher is not very motivated to go to a nature school.

He does not see connection between nature school education and his work.

It was more of entertaining nature experience or being outdoors for city children.

The teacher is sceptical about the educational capacity of the nature school. First of all, it is hardly possible to get a booking at desired time; secondly, children might not get to see much if the weather is bad, if it is wintertime, or if animals are hiding.

It seems that the teacher did not have specific interest in any theme, so he accepted a generic theme offered by a nature interpreter: "nature netop nu" ("nature right now")

"So we ask these nature school people to show us what is going on right now/it can be a problem because the nature is not giving anything/it might be Winter and then there is not much to see."

"We normally try to get into the nature school when we want to/but there are many schools and classes who has to share the time available/so we take what we can get and try to appeal to do it the best way"

"If I say it has to be about the fox/where is it right now? /It might be sleeping in daytime/so what will come out of that?"

"They talk about the area and why they are there and this nice place with all the animals/and we must touch them and ask questions about it"

2. Nature school is a filed trip option, which is known, reliable and convenient.

"I am going to the nature school every year for nine or ten times/ it should be what I have expected to get out of the nature school"

2. How do public school teachers integrate children's experience from a nature school into their subject teaching?

1. Teacher informs the children what the session is expected to be about.

But since the theme is not very certainly determined before the trip, he usually discusses their experience after the tour.

"I normally talk about I expect them to listen to/this is not their normal teacher and they should be quiet and listen to what they are telling them/ I normally talk afterwards the trip because I do not know what they will talk about"

"Yes we talked about what we had experienced/was it a good trip or was it something they could have been without"

2. Nature school teaches how handle nature with care

It is a place to learn about nature and to be in the nature without harming it.
There is no reference to class room work.

3. Class visits to nature schools introduce children and their families to this way of recreation.

The teacher hopes that children are coming back to the nature school with their parents on “open days” held by the nature school.

“And meeting these nature people and then coming back with the parents and using it at other times/and when it is school time/we would like them to come back when the nature school has “open days”/what is right outside Albertslund”

“Their way of being there? /can it harm the nature? /will they not pollute the nature? /are they there in pact with nature? /and that is the agenda/another thing when we meet these people is that they are there without annoying animals and trees/so trying to give the children a way of handling the nature with care”

4. The teacher refers to nature school experience in his nature and technique and maths lessons, when there are calculations on the example from agriculture.

“I do it in natur og teknik//I also do it in maths because there is a subject about it in the books about agriculture/why are we doing these things in nature to get something out of it/and why are we having these green areas/nothing is coming out of them it is just there/who are living there”

5. The teacher does not integrate nature school into his agenda.

Study books provide all what is necessary to teach his subjects. (Maths and N&T).

Nature school and public school work separately in parallel modes, and to do cross each other.

Vestskovens Nature School is just a nature education institution in Alberstlund

“I have my own agenda now/and it is not integrated with nature school/it is there and it is an institution in Albertslund/and the school system and program in my education of the children is pretty much available in the books I am using/so we are separately doing our own things”

6. Nature school session is just a scratch on the surface of a subject.

It is not really educative.

It is seen as an outdoors entertainment and socialising occasion.

The nature school gives an experience of the nature in Alberstlund

“But it is now more or less for pleasure or entertainment/because it is only a scratch in the surface of the subject/later on we are going down deeper in some areas of the subject/there the class are having an experience with each other/biking out there and meeting people who are there working there and what they are doing there and what are telling about the animals/it cannot be so thorough/we take it as it is and we ask them to do it so interesting as possible”

“To have a place to be if I want to go ten times out in the nature/that could be a more thorough work for the children”

“There are animals such as sheep and they can show us where the mice and cats are/they can climb in the trees/they can bring something home if the trees are more than 10 or 12 m

high/that is an experience of what the surroundings can give them living here in Albertslund/it is not very sophisticated what we are doing here with the nature school”

7. Nature school is the second best choice for a field trip.

The teacher takes a class to a nature school only once a year, and he cannot do much in one session.

Zoo seems to be more interesting for children, as they can see exotic animals there. A promise of fox site does not tempt them too much. Since visit to a Zoo costs some money, a nature school is the second best choice.

“I have only 1 meeting with them a year and I have 40 classes with children a year/and I can not (unclear) on one visit there/ I would normally go to a zoo in Copenhagen. But it is too expensive now/I would like to go to Albertslund nature school one time a year/and the next year to look at animals from other places/because there the interest from the children is so much bigger/you can not catch their attention with a fox then/which is close/ it is there and there are 7 or 8 entrances/they say it is a fresh place/I do not think the children are discovering anything/they should have more time doing that”

8. The teacher uses the experience his class has got together in his subjects.

Social experiences are important for a better spirit and cooperation among pupils.

Nature school trip serves educational and social purpose.

“It gives me an opportunity to ask if they can remember when we went some place/and then use it in this subject I am working in “

“It is something the class has/I normally put a lot in what we are experiencing together/it could be theatre or cinema/I think it is important to use what we are experiencing together”

“But is a more social side of it/what we are experiencing in trips and other events (TAPE CUTS!) ...normally the agenda is very important to come through the aspects of natur og teknik/ (TAPE CUTS!)...”

9. Nature school has several motivating factors:

- it is a new place, which is a refreshing change of learning environment and stimulates interest;
- children experience new teachers and are taught in another way
- children experience each other in a new way
- children experience their school teacher in a new role (observer, or even an equal group member)
- the teacher gets a chance to observe his class while it is taught by another teacher, using different methods

“It is the place and the teachers there/and my experience with the children and see them when someone else is talking to them/and the environment we going out to with these teachers and what they are taking home that we talk about afterwards/and listening to them for my adult interest/are there any other things they can give us”

3. How are nature school sessions integrated into in thematic projects at public schools?

4. What kind of learning motivation factors do pupils find in the nature?

1. In general, children do not show much interest in nature.

Their lifestyle detached them from nature. They are not used to it.

“They live in a cocoon of limitation/they are going to school and their time is very occupied/so actually being in contact with nature is very little/it is a sad way of using the area”

2. In order to make children interested in nature, one nature school session is not enough.

One tour to the woods does not make much difference in changing attitude within urban lifestyle.

“They are not used to it yes/to get an interest in something they must have time to experience it/so it is only shallow”

“We would have to be out for days/but it is not that limited/they should have a global interest/it is very important for them to have this interest in nature”

5. Is there any influence from nature schools on pedagogic practice in public school? How different or similar are their practices?

1. Nature school is a practical supplement to theoretical public school education.

Nature schools are much more in touch with nature than public schools.

“They are more in contact with the nature than I am/I am doing the work in theory and they are doing it in practice/I need a green man and I am just teaching what I am supposed to”

2. The teacher observes his class at a nature school session and tries to identify their specific interests in the nature;

“When I am sitting there and they (nature guides? - V.F.) are telling about the nature school I would look at the children and see if they are interested in something specific”

“I always enjoy seeing them with space around them/seeing their interest in nature/and to see what they are into right now/how some are insecure and how some pick up the small animals”

3. The teacher observes his class at a nature school and learns if there are some themes and methods he could use in teaching his subjects

“And see if there is something we could use/so I could get something out of the meeting with nature school as well/normally it looks like I am there taking an hour off while somebody else is teaching my children/but I am looking if the interest is there”

4. The teacher uses the same methods in N&T.

The *hands on* method is the best way of teaching.

But classroom lesson cannot bring intensive hands on experience. Therefore it is important to go to Nature school and where children can get diverse and intense tactile experiences related to the subject.

The teacher admits that the same lessons can be more effective if they are given at a nature school or in combination with nature school.

The teacher is interested in observing his pupils during nature session and also gets inspired about new themes and methods of teaching

“Pretty much, when I have nature og teknik/ so we also think the best way of teaching is to have something in your hand/but we do not have the nature just outside the door/so normally we sit in here in the classroom/so being out there is a positive element for them/I can not bring the same intensity into it if I am not out there/so if I could go on trips instead of sitting here it might be better – I observe the children when the people at nature school tells and I get inspired that way”

6. What do public school teachers do for nature education independently from nature schools?

7. How do public schools and nature schools talk to each other? Institutional links.

1. The teacher wanted his class to have experience in the nature

“I wanted to give my class an experience about nature/and I would like to have them going out of the school and in the nature”

2. It can be difficult to get an arrangement with a nature school for desired time and theme

Nature schools are always fully booked in a matter of days. The teachers agree to the appointments and themes they can get, which is not always what they wanted and what their classes need

“V: did you ask them to give you this spring theme?”

T: no they just gave us that/it was not us who wanted it in spring”

“We normally try to get into the nature school when we want to/but there are many schools and classes who has to share the time available/so we take what we can get and try to appeal to do it the best way”

3. Nature schools adjust their sessions to the level of each grade

Nature interpreters are well aware of the knowledge children are supposed to have in each grade, of what they are interested in at certain ages.

They design their sessions to match this level and meet the interests of children.

This integration approach leads to well suited efficient and educative sessions.

Children always show a lot of interest in what nature interpreters have to say.

By the time pupils reach the last grade, they have been to the nature school about 9 or 10 times, and went through most of the theme they offer at the nature school.

“I rang before summer the nature school/then he asked what the purpose should be/and I answered him/that it should be what nature would bring that day. I think they have a scheme in the nature school/so they know if they are 1st, 2nd, 3rd etc. Then they know what level they are on/and what they are interested in/so when they have been in school from kindergarten to 9th class then they have been through all the subjects they can give at the place’

4. Nature interpreters are well qualified for their job

They have good knowledge of nature in general as well as good knowledge of local nature, including vicinity of a nature school.

“It is an experience and a different and nice place to be/and these people knows all about nature/the children listen very good to what they are telling them/so they are really aware of what is going on”.

5. Nature school can accommodate one class only with one session a year.

This what is expected from a nature school and such a visit is a part of a year plan for each class.

It does not make any significant impact on education.

If nature schools offered more possibilities to come in there, the pupils would get more out of this nature education.

It is a wish from the teacher to have a better dialogue with the nature school for better cooperation and better education.

“I am going to the nature school every year for nine or ten times/ it should be what I have expected to get out of the nature school”

“For one class/and if you take all the classes here in Albertslund it is now what the nature school can provide us now/so all of us are only coming there once/ so it will not play such a big roll in the whole year but it is in the planning for each year”

“If they would give the opportunity more than once a year/and more dialogue with the them/now I just take what comes/if I had more times a year I might get more out of it”

“We would have to be more together than we are now/they have no time to talk more with us/they need more staff because there are room for 200 classes a year and that is pretty much how many there are.”

6. Nature school is the second best choice for a field trip.

The teacher takes a class to a nature school only once a year, and he cannot do much in one session.

Zoo seems to be more interesting for children, as they can see exotic animals there. A promise of a fox site does not tempt them too much. Since visit to a Zoo costs some money, a nature school is the second best choice.

“I have only 1 meeting with them a year and I have 40 classes with children a year/and I can not (unclear) on one visit there/ I would normally go to a zoo in Copenhagen. But it is too expensive now/I would like to go to Albertslund nature school one time a year/and the next year to look at animals from other places/because the interest from the children is so much bigger/you can not catch their attention with a fox then/which is close/ it is there and there are 7 or 8 entrances/they say it is a fresh place/I do not think the children are discovering

anything/they should have more time doing that” (compare to what nature interpreter said about this fox whole)

7. Visits to a nature school is not a requirement

Although they are planned for each class every year.

Teacher can choose a nature school, but he can also choose another place to go for a field trip.

He can also cancel a trip to a nature school if he thinks that it does not meet needs of a class.

The main idea of nature school education is to create interest in nature and to show children how they can interact with it and use it.

“No it is our own decision to take that/so if I want to do something else and not ring them/ then I might cancel it if it is not suitable one year/maybe later on they will have something else and they have other projects they could spend time on/but the general idea of the nature school is to get an interest of the nature so they learn they can use it”

8. School administration supports green policies of Albertslund municipality

Nature projects are also supported and encouraged by municipality.

And so does the school management.

“I think they like that we go to nature school/but not if it would not give the children anything/but all here in Albertslund which is green and has something to do with nature and recycling they are very much interested/if I have a project with nature school they might make it possible for me to go there”

“I think it is because it is the city’s mark that the surrounding s are very green and also in recycling/they have been first in many things”

“If I would come with anything that has to do with nature/I don not think the management would have anything against it”

School subjects: drawing and nature & technique
Place: Jaegersborg Dyrehaven
Nature Interpreter: Annegrete Munksgaard
School & class: Baunebjergskolen, 4A, 4B, 5A
Theme: Cutting up a hunted deer (October 2003)

1. What is public school teacher's motivation to take a class to a nature school?

1. The teacher was motivated by her previous experience of the same tour.

The previous tour (10 years ago) made a big impact on the children. However, they were much younger than the children in our case study, and did not express negative feelings.

2. The teacher has a personal interest in tactile activities, using all senses.

“I think as an art teacher and biology teacher I like to use my senses/that is why I chose those subjects/I like to use my hands and my eyes/to smell the things/I am a visual person/that is why I do not like planning and organisation/I like more to use my senses”

3. The teacher has a personal experience from childhood related to the tour.

As a farm child she saw sheep being slaughtered, which was shocking and interesting, disgusting and exciting at the same time. As a child she learnt it to be a part of life. She knew it has to happen if she wanted to eat meat. She wanted her classes to have this experience too.

“Yes/personally my father is from the Faeroe Islands/and I have seen sheep being killed/and it was shocking for me as a child/but I also thought it was very interesting/and also I could see that was a part of life/we had to do it because I like to eat sheep/though the lambs are so nice/but it is a part of life/[...] I like more to use my senses/and when you see the red blood and the smell/you can see the animal has just been shot/that is disgusting in one way, but exciting in another/

4. The school administration thinks it is important for the children to go on field trips.

They support field trips by purchasing a special public transport pass that allows classes to use public transport every day.

“The school encourages us to go trips because we have bought a special pass that allows us to go free every day/we have spent 7000,- on pass for the trains and busses because they think it is important we leave the school/

5. “The administration encourages the green thinking in this school by making special classes for two teachers to plan these kind of weeks/and write letters and to go on conferences.”

6. The school is a member of the Green Flag Club.

“It costs some money and time to be a member of the Green Flag Club”. But the Green Flag does not compete with other activities that the school is involved in.

“But some schools do not do the Green Flag because it costs something/it needs some teachers who want to work with this/if you are not really into it you do not want to use spare time/because we get some paid hours/but have to use some spare time.”

“Green flag forces us to do an extra effort.

7. Field trips are a part of curriculum from the ministry.

But it is not obligatory. Teachers often choose to go to a nature school because it is easy for them.

Nature interpreter leads the session, and a teacher can concentrate on children in the meantime.

“Yes/perhaps some teachers will not go on the train with the children because they are afraid of the traffic/you can not force a teacher to do it”

“We choose a nature school because it very easy/it is very nice to have an extra person/then you can concentrate on the children’s behaviour/and a naturvejleder will be better prepared in a special area because he knows it better than the teachers do”

2. How do public school teachers integrate children’s experience from a nature school into their subject teaching?

1. Children learn where food, specifically meat, comes from.

And how it is produced and processed before it reaches their dinner table.

“The hidden benefit is to see that life is not so easy/it is not just going to the supermarket and pick food/you have to give the animals food/you have to kill the animal/you have to cut it up/you have to (unclear)/it cost a lot of work to eat meat”

2. The learn that they have to kill in order to eat meat.

“It is disgusting to kill/I think it is important that it is important to know you kill to get something to eat/I do not know why/the human being is often cruel/that is not what I want to show the children/but I just want them to see the reality/if they want meat/they have to kill”

3. Cutting up a dead deer caused different reaction, but no one was indifferent.

It is definitely a lifetime memory.

“Most thought it was rather disgusting to be in “Dyrehaven”/but some, mostly boys, thought it was interesting/but although some thought it was disgusting they will remember it for the rest of their life”

4. Ethical discussion about death and killing animals.

How to kill? How many to kill? – How much meat do we need?

“Death we can talk about afterwards/how do we treat the animals before killing them/how much meat do we need to eat/we can discuss the things when they have seen how complicated it is to get meat/then it is easier to discuss the matter I think/some children perhaps never want to eat meat”

5. Although many children thought it was very unpleasant to see how a deer was cut open, most of them stayed and continued watching

“Of course they are curious/it is like when the ambulance comes/you want to see it but you do not like it/because you have never seen it before”

6. The teacher did not have a possibility to discuss the tour with the children

because holiday came right after the tour. Besides, the teacher did not have lessons with the same classes after the tour. However, other class teachers know about the tour and they would discuss it where it is relevant in their subjects.

“I could not discuss because we had the holiday the day after/but I know the class teachers. Of course they would talk about it next time they talk about animals or food chain/they would remember this experience and they would talk about it.”

“I know exactly what the other teachers have done/because we made a schedule together/so I know where they went fishing and what fish they caught/and what birds they saw/the teachers have talked together”

“We talked about what the deer looked like inside and the anatomy of it /but not about life and death”

7. The teachers plan their schedule together and the can use the experiences children get in other subjects.

“But it costs a lot of time planning the things/but we know exactly what the other ones have done”

“We do not do it that detailed/but we tell the main things”

8. The Dyrehaven tour was a part of two week green project “Experiencing nature”, when most classes of the school went for different activities in nature. Children could choose what they would participate in. They wrote their impressions in diaries.

“On the trip to the wood everybody joined/ but some of the things they do not have the experience in common that complicates it because some of them have not participated/ but we do not do this kind of teaching all through the year/ it was individual decisions/ and there will be some disadvantages about this kind of education/ because some of them of course wanted to go fishing/ and some are sad they made the wrong decisions/but they also learn something from that/ it is not easy to make decisions”

9. Nature lesson helps to understand life and environment of an animal. (Deer)

“ I think it helps the children understanding the surroundings of the animal/I do not think I could have done it by showing them a book/because when they went to Dyrehaven/they could see the animals had eaten from the trees and that some of the trees had a fence around so the animals would not eat them/it easier to understand when they see it outside/and the droppings from the trees/and they could feel and smell and look the leaves/it gave a better effect to be there”

10. In order to save natural environment, we need to shape caring attitude. In order for children to have care and feelings for animals, they need to see those animals.

“I think if we are to preserve the nature and to take care of our surroundings/then they must have a feelings for them/if they have never seen a frog they do not care if it dies/and if they have never seen or touched an animal they do not care if it dies/

11. Nature and love for nature is an ethical value.

It is an important condition for happiness

“Happy children have to love nature/it will always be a joy in their lives no matter what they will be”

12. Nature interpreter who is a great asset to this nature education

She knows the forest, its history, the shooter of the deer, how to cut up a deer. She is good at talking to children, she knows their reactions.

“It is very useful that the person we met in Dyrehaven she knows everything about it”

”And she knows how to cut the animal/what I could never do/she does it in a natural way/very quick”

3. How are nature school sessions integrated into in thematic projects at public schools?

1. The Dyrehaven tour was a part of two week project called “Experiencing nature”, when most classes of the school went for different activities in nature. Children could choose what they would participate in. They wrote their impressions in diaries.

This project was a part of the Green Flag program. And it covered classes from 0 to 9th grade.

“To put focus on nature for fourteen days/of course we also had biology and science the rest of the year/but here they get some extra input”

2. Children from different classes joined up together in activities

- three classes learnt to work together
- children had to make their own choices
- more subjects were on offer to each pupil:
 - fishing
 - sleeping in the woods in shelters
 - planting flowers in the school’s “green” garden
 - bird watching, and many other
- everybody had to go to the deer tour

“We mixed two classes/so they would get more friends/also helping them working together with new friends/so in fourteen days those three classes worked together/made new friends and saw it was possible together on different levels”

“It was fourth grade and fifth grade/and some of the fourth are mature and some of the fifth are not so mature/so it was easy for them to work together”

“They decided themselves/we offered for instance twenty different things/and then we tried to make a schedule were they could get most of their wishes/ and it the first time we have tried this/it was a bit complicated”

3. The main idea behind this project was to give children positive experience in the nature, to make feel happy with the nature.

“The main purpose to make this nature-education was to make the children happy/make them learn that they could play in the nature/that it is nice to be outside/therefore we let the children choose themselves “

4. Green Flag Club

Green Flag membership is a prestigious image for a school.

The deer tour was not planned under the Green Flag program.

The school is required to comply with certain activities, and has freedom to choose others.

“To get the green flag we should make different things/for instance we should make our school more nice with more flowers and more trees/and we should a small lake/we should go coast watching/and something about the birds in the area/this particularly tour was not to get the Green flag/but it was in the same project.”

“It was fourteen days with nature all the school to get the Green flag/but we did not need to see an animal in Dyrehaven”

“There were some things you should do/certain things/what I just mentioned/*coast watching/and something with birds*”

5. During the 14 days of the project the classes had to write their experiences down in diaries

They also made paintings about their activities.

They visited each other's homes to see the pats – cats and birds.

“But in the 5th and 4th grade they did not have a Danish or math in normal way/ but they had a diary/ they should every day write in the diary/ you can look at the diaries here/they made small paintings about what they had done/and in the end they should tell about whole nature experience/and here it says: “I think it was funny and the most fun was to be in the wood and climbing in the trees/I think it was nice to look at the animals at home”/They went to their houses and saw the cats and the birds/they also had something about pets/so they went to see all the pets in the different homes”

6. It is more effective to plan nature activities together in an intensive project

Of course, it is then not possible to look at nature in different seasons.

“I think it is better with nature all together/of course when you get older and you have to read something it is nice to have more time to read/but I think it is the best to make it in concentrated projects/but of course in Denmark were the weather changes so much/ you can not say you only look at one month in the Spring because Winter is also interesting/where do the animals hide/how do they survive”

7. The idea of one teacher having entire week for just her subject is to let a class concentrate on that subject and not be interrupted.

It came before flexible schools. In this school they do it eight times a year.

“It came before the flexible school/many schools had that kind of teaching/that you have the same teacher for one week because if you make some art or maths it is nice to have the same books and you do not need to be interrupted”

4. What kind of learning motivation factors do pupils find in the nature?

1. Freedom to choose activities and to take a decision by themselves make children more interested in what they do.

“The advantages are when the children have chosen themselves they take the responsibility themselves and they are more interested/ because they have had the possibility to say no/ if they would rather go and plant roses or another thing”

2. A new teacher is more interesting

Because children don't know her and they get to know things in a new perspective.

Since a new teacher doesn't know them, they get a chance to be seen in a new way.

“I think it is a very good thing for a class to have guest teachers/ because she does not know them and who is naughty how they behave/she comes with new eyes and the children get a new chance/and they listen much more careful to a guest teacher because it is new and exciting “

3. Children wrote down their impressions and experiences from the project's activities.

“Each others houses yes/and the parents were perhaps at home and told them about them/and they took photos/some of them brought the pets to class/”and the most boring was to go the mushroom tour”/that was boring he said/and he was angry that he did not get the opportunity to go fishing/because he had chosen fishing/ but sometimes they could not get anything/ they could get 50% or 80 %/and he hated to write diary/”all in all it were good weeks/I hope we do it again – this boy is from Aserbadjan/he is not so good at Danish/but he has written something/this is Dyrehaven/”I think it was funny/ I have seen a deer cut open/ I have touched the heart, the brain and the stomach/” he does not tell if it was nice or not/just what he has seen/he has not told what he think about the whole nature project – and here is one/”I think it was exciting to learn about nature/but think it was the most fun to make ‘kurve’ (basket. red)/ and it was hard to go bicycling when we went fishing/and it was funny to be in Dyrehaven/but it was a bit disgusting” – In the end he says “I do not think I got enough help to make the birdhouse” they sawed and made small houses for the birds/and he did not get help enough/ so he thought it was difficult to make those “

5. Is there any influence from nature schools on pedagogic practice in public school? How different or similar are their practices?

1. Nature interpretation methods, demonstration and hands on, are very effective. They involve all senses.

Nature Interpreters have knowledge and skills public school teachers; do not have, because they have many different subjects. Therefore schoolteachers' qualification is not as deep and specific as the qualification of nature interpreters.

Classroom environment does not allow to use many sense, it is difficult to make children smell, touch and taste things.

“I think they show the children and they let them touch and try the things/their methods are very good/and they have time to plan and special rooms in “Jagt og skovbrugsmuseet” with stuffed animals where they can see how they look and they have painting and measuring tools so I think their methods are very good/ they work with the same things every day/also in the Zoo we have tried to use the special teachers they have there/and they have a force we do not have as teachers because we have many different subjects/ I have Danish, math and biology/ I can not be a specialist like they are/they involve the tactile methods/they use all senses of the children/it is difficult to make the children smell and taste and touch in a classroom”

2. Pedagogic approach in public schools gives teachers freedom to use their own teaching methods.

Howard Gardner's theory of many intelligences is a dominant philosophy in teaching and learning methods.

“We have method freedom/every teacher can use their own methods/every teacher has his or her own way/at the moment Gardner's theory of many intelligences is used at the moment/some children are good at logics and others at using their senses”

6. What do public school teachers do for nature education independently from nature schools?

1. “Green” garden.

“They like it very much/ /but it is funny to go there/last year I had potatoes with my class with foreign teachers/we dug up the potatoes and we made potatoes with corn and tomatoes/it was nice to eat your own potatoes”

“They are ready after summer holyday/and then the children dig them up and then we prepare a meal/every class has a bit of the garden”

“It is funny because some of them hate to touch the dirt/some of them when they see a worm “ouuu! It is disgusting”/some of them like it very much/they want have the small beetles or worms inside like a pet/and they can not/they are going with their worm the whole break talking with it”

2. The teacher takes her classes often on a field trip. Being a biologist, she likes to go to nature areas and she has qualifications to teach about nature.

“ We always look at what is close to a railway station/we have also been to woods without naturvejledning/and many trips we do on our own/because I am a biologist myself

“Some trips we have been fishing on our own/or picking mushrooms”

3. Under the Green Flag.

The school has got money from a municipality for conserving electricity and water. The school bought flower seeds and onions and gave them to children to plant the flowers in the “green “ garden.

“We have a special garden in this school called green garden /we have two gardens in this school/one where they can have tomatoes and potatoes/and then we have the other garden that we have been preparing this year/ in those two weeks/we have been digging and cut the grass away/ and now we have made some (bede) prepared for roses and bushes/so we get more birds and butterflies”

**7. How do public schools and nature schools talk to each other?
Institutional links.**

1. The teacher can go to a nature school ten times a year, at least.

It is used for specific activities

“We use it very often many classes do/we have many connections: Esum, Møllegård and Nybroe” where we can go ten times a year”

“I have used nature school also in “Jagt og skovbrugsmuseet”/and private in a summer holiday in Skagen in Jutland”

2. Lejerskole (play school) is an occasion for a nature school.

Children together with their parents sleep over night in tents.

Another occasion – cutting trees. A nature school has the required licence and a forester to do this.

“We use it when we are going together with parents or when we have “lejerskole” when we sleep in a lodge or in tents/ we use the nature school/in this class they had to cut trees and then they need a license/and then the nature school helps them “

3. Nature schools serve their purpose well.

“I have only had very good experiences here in and in “Jagt og skovbrugsmuseet” in Hørsholm/I so not think they could do much better/they are very good”

Appendix VII. Interview with Michael Hansen December 2003

School subjects: mathematics, nature and techniques, physical training, drawing
School & class: Skottegåds skolen, 2.b
Nature school theme: Birds (28-10-03)
Nature interpreter: Rikke Mortensen

1. What is public school teacher's motivation to take a class to a nature school?

1. A teacher in nature & techniques, who is a fan of eagles, wanted his class to learn about birds that live on Amager. Together with a teacher of Danish, they planned this trip, which became a part of a small project about birds.
2. To comply with the legal requirements, the 2nd grade has to be taught certain things about nature and animals.

Nature school tour was planned in this context as well.

“According to formal requirement I must teach the 2nd grade class about the nature, about birds and animals that live in the nature. So we took them to the nature school. There are some children that have never been there before.”

3. Nature school offer many possibilities for outdoor activities

- over night stay with fire and cooking
- Maths,
- seeing and touching things that are been taught in a class room, like plants and animals

“They have a lot of very exciting things there. You can also go as a group and sleep over for 1 or 2 nights in tents, make fire and eat, do a lot of stuff. You can do maths.

When you work as a teacher with children, it is very important that you go out and show the children those things that you teach about: water, trees, etc. It is not so good just to read about it. You have to feel and see it, state it.”

3. Nature school is a place where young children are encouraged to socialise, play together and learn about nature at the same time. (also see theme no. 2)

“Lene and myself, when we were planning the visit, we thought about what is the main purpose of going to the nature school. And it is that it is very good for children, when they are so young, to go a place together, where they can have fun, and where they can learn a little about the nature and birds. We just talked about what kind of things they could learn at the nature school.

I decided about the birds, because they have this theme on offer on the web. That was great! Lene agreed with it.”

2. How do public school teachers integrate children's experience from a nature school into their subject teaching?

1. Nature school visit was planned as a part of a small project about birds
2. Prior to the visit the class watched a film about eagles
3. Prior to the visit the class lesson in biology about birds.

Biology class has a collection of stuffed birds.

“We talked to the nature school, and afterwards we saw a film about eagles. Then we had a biology lesson(s) and talked about eagles and different birds that we have in a biology room in our school – stuffed birds.”

“Yes, so that they can see and feel them. There are a lot of questions from children about the birds: why do they look like they look?”

4. Prior to the visit the class collected leaves and examined them in a microscope.

“We went for a walk and collected leaves from trees, we looked at them through microscopes. We talked about leaves in the summer, and rain, about the colour of the leaves and why does it change when they fall down”

5. After the nature school visit we did a few exercises about birds

- writing down characteristics of eagles in terms of questions, children were asked to answer their own questions by going to a library
-

“Yesterday we wrote down some things about eagles: how long is it? Where does it live? Is it dangerous for people? In order to answer these questions, they have to go to a library and find the answers by themselves. That is the main thing.”

6. Nature school is a place where young children are encouraged to socialise, play together and learn about nature at the same time.

“Lene and myself, when we were planning the visit, we thought about what is the main purpose of going to the nature school. And it is that it is very good for children, when they are so young, to go a place together, where they can have fun, and where they can learn a little about the nature and birds. We just talked about what kind of things they could learn at the nature school.

I decided about the birds, because they have this theme on offer on the web. That was great! Lene agreed with it.”

7. Nature education and nature school experience plays its role in shaping young person's views.

“When they grow up, they will remember this experience and it will model their views. Because if the nature school was not there... it is not enough just to learn about nature, you have to see it and be in it as well.”

3. How are nature school sessions integrated into in thematic projects at public schools?

Birds. See no.2

1.Nature school visit was planned as a part of a small project about birds

2.Prior to the visit the class watched a film about eagles

3.Prior to the visit the class lesson in biology about birds.

“They learnt about birds' beaks and feet. What do birds do with their beaks and feet? They have to reflect over what the nature school guide said. They have to imagine what can a bird

do with the beak and feet that it got. Looking at the structure of the bird's body. If the beak is sharp is it good for eating plants....

4. After the visit to a nature school children did exercises about birds

The teacher asked the pupils to give main characteristics of an eagle or a swan. Pupils worked in pairs. Then they made questions about those birds they worked with and have to find answers in a library.

“I asked them to give a few main characteristics of an eagle, for example, ‘fast’, ‘sharp’, ‘Big’, brown’ and so on. There are many other words. Then they had to work in pairs about a kind of a bird. They had to make questions about this bird's characteristics and find answers for them in a library. For example, about a swan. How old do swans become, how many young do they usually have, what does it eat.”

5. Children remember a lot from their experience at a nature school. A teacher can build on this knowledge and teach more about birds.

The teacher asked children to write down a few things they learnt at the nature school and share them with their classmates

“They remember a lot from the nature school. I can build on this knowledge and give them more about birds. We have to be more precise and write things down. They can share with each other what they learnt at the nature school. For example, a swan lives about 10 years, it lives in Denmark. It is a little project.”

6. The motivation factor is the main function of a nature school.

The teacher sees its mission in awaking children's interest in nature and learning about it. The experiential experience and curiosity from nature schools helps a public school teacher to build theoretical scientific knowledge.

4. What kind of learning motivation factors do pupils find in the nature?

1. Children like how they are taught and treated at a nature school.

They are attentive and receptive. They are interested in a new teacher.

“It is another thing for children to experience another place, other teachers, to go out and touch things...They are in another kind of class room their, and there are many things to see in this class room. It is especially different and interesting for them if they live in a big city like Copenhagen.”

2. Children get very excited from direct contact with live animals.

Example with a snake and a dog at the bird session. These two animals were at the peak of the interest.

3. They are also very interested in seeing and touching stuffed animals.

“I think it was quite good. The school staff is nice, and the children were listening. They were very excited about the dog (live), the snake (live) and to see the stuffed animals. They could touch them and feel them. Some children held the snake with some help form the staff.”

4. They liked to walk outdoor, to watch wild birds fly, to sort birds' bone peaks and paws.

“Watching and holding a snake was extremely exciting for them. But there were many other good things to do: walking outdoor, watching live birds fly, seeing a collection of stuffed birds, sorting birds’ beaks and paws.”

5. The mere fact of going away from school to an outdoor field trip is a strong motivating factor for children.

“V: There is also a small collection of stuffed birds (animals?) at your school...”

T: Yes, but it is not the same. Just the fact that we are going out to see something different, or to a place which is quite different from our school, is a big motivating factor.”

5. Is there any influence from nature schools on pedagogic practice in public school? How different or similar are their practices?

1. Education methods at a nature school involve children in “hands on” exercises with new nature objects. Children are strongly motivated in this way

“The main thing about learning process is HOW they see it. If children are board they do not learn anything. But all of the children think that it is exciting to be at a nature school. They could sort the beaks and paws; hold those in their hands. That is very important. “

“You also have to consider that going to a nature school is a break from the daily school work. They remember such breaks, and what they did. “

2. The teacher evaluates nature school methods as very appropriate and successful.

The main didactical principles are also considered. For example, that lessons have to be dynamic, activities have to change often in order to maintain high level of attention.

The nature guide was following all these rules and it resulted in active response from the children.

“ I think they are very very good. Of course, there are didactical principles that have to be considered. Young children cannot concentrate for a long time, so they need some captivating and changing activities and exercises to keep their attention. Lessons have to be dynamic, the tasks have to be changing quickly.”

If the nature interpreter talked for a long time, it would not have been very good. But she did it very well. And the children were very excited about it, and open minded. This is very good.”

3. Teachers in nature & techniques often use the same methods as nature schools

“Yes, but I did not take them from the nature school, I just use some of the same methods. “

6. What do public school teachers do for nature education independently from nature schools?

1. The teacher initiated a small bird project with a few different activates, such as writing and talking about birds. Nature school visit became a part of it.

2. The teacher is enthusiastic and takes his class regularly out to nature, for example to collect leaves in the fall.

3. Drawing lesson. Drawing stuffed birds in white and black pencil.

The aim of this exercise is to learn to see details of a bird's body. They also drew their own hands.

This lesson or theme also had elements of nature & technique as they had to talk about the birds they drew.

“They drew an eagle and other little birds in groups of four lying on the floor. It is very difficult to draw a bird, but they tried and their pictures are nice. They learnt seeing details about a bird, its body. The drawings were white and black, made with pencil. This lesson had nothing to do with the nature school and nature and techniques. We had it before the visit to the nature school. It was not a part of the small project I mentioned above. It was just a theme in art when they were supposed to look at an object carefully and draw it. I thought that animals and birds would be interesting objects for the children to draw. They also had to draw their hands.

I put a bird on the floor for them to draw. They have to concentrate, use their eyes to see an object.

There are also elements of nature and technique subject, because we have to talk about the birds that we draw. Especially in case of eagles.”

7. How do public schools and nature schools talk to each other? Institutional links.

1. It is an advantage for a public school if a nature school is situated in its vicinity.

“They are in another kind of class room there, and there are many things to see in this class room. It is especially different and interesting for them if they live in a big city like Copenhagen. Or... It is not so bad down here, because the city is quite green...But I think it is very good idea to have a nature school so close to a public school and the city.”