

FOREST IN TEACHER EDUCATION: HOW TEACHER STUDENTS PERCEIVE AND RELATE TO FOREST

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Abstract

In a country like Finland, there has been intensive discussion on the use of forests. Forest has a special meaning for Finnish people and also a significant role in comprehensive education. Teacher education should also focus on forest's role in students' life. This study describes one approach which could include forest issues in teacher education. Teacher students' (N=117) perceptions of forest and their relationship to it is discussed in the context of this course. The data has been collected by a questionnaire which the students filled in partly before and partly after their visit to the forest. They were asked to explain their relationship to forest and how they view its use in their future life and teaching profession. For most of them, forest is important. The main reasons for students to visit forests were to seek tranquility and recreation, physical exercise, and to collect berries and mushrooms. In their future profession, they said that they would generally be willing to make different kinds of trips to forests, and be there in order to learn everyday living skills as well as values.

Key words: forest perceptions, learning environment, relationship with forest.

Introduction

Over the past decades, we have been confronted with substantial changes and challenges in several areas of our lives. There seems to be widespread agreement that education will have to play a key role in order to adequately and pro-actively meet these changes (e.g. Buchberger, Campos, Kallos, and Stephenson, 2000; Perkins, 2009). There have been changes in the very nature of the criteria of skills needed, therefore the focus cannot be on the traditional way of teaching knowledge and facts at school and in teacher education (Laurilland, 2002). Claxton (2008) claims that education is still too much based on teacher's instruction and the content-oriented learning of facts; the result is that the integration of intellectual, social, and emotional aspects of student learning has been forgotten. Lombardi and Oblinger (2007) criticise educators for concentrating mainly on the cognitive learning domain, so that the other domains, affective and psychomotor, have been considered to be less valuable. In particular, the conative domain, which determines whether a student has the necessary will, desire, commitment, mental energy and self-determination to actually perform, has been almost totally ignored.

Sawyer (2004) argues that the traditional implementation of a curriculum and teaching, with scripted instruction, emphasises lower-order skills in students. Instead of that, in order to promote sustainable communities, the main focus in teaching should be on learning generic skills which are general skills, qualities, knowledge, and traits which people should possess to succeed in the future. These kinds of generative skills are useful, active and applicable later in life (Perkins, 2002). To attain this, learning has to be modified to be more authentic, more useful, and more contextualized (Paris and Winograd, 2001; Perkins, 2009). The challenge is

to connect learning with real-life contexts and real-world problems in the students' own lives and communities, as well as in global issues (Rule, 2006). Teachers need to provide instruction across a more extended variety of contexts and defragmented themes, incorporate a wider set of perspectives, and implement a more extensive set of instructional strategies (Paris and Winograd, 2001).

Several teaching strategies which emerge from the constructivist approach, emphasize learning which is contextualized. Contextualizing means context-making (Van Oers 1998). At the pupil's level, contextualizing denotes the process that takes place within the pupil during the learning process. In instructional strategies such as inquiry learning and problem-based learning, learners start with questioning and exploration which then lead to investigation into issues, problems or idea of value. This kind of strategy involves asking questions, gathering and analyzing information, solving problems, generating solutions, valuing issues, justifying conclusions and taking action. (Hmelo-Silver, Duncan, and Chinn, 2007.) According to Buchberger, Campos, Kallos, and Stephenson (2000), 'powerful learning environments' should be attempted both in schools as well as in teacher education. This kind of learning environment elicits students into an active and constructive learning process that fosters the full range of cognitive, conative, affective, and psychomotor outcomes in education. It requires students to become agents of their own learning activities and processes. At the same time, a powerful learning environment offers ample opportunities for interaction, communication and co-operation. Teachers are supposed to acquire competence to establish these environments; to support the development and construction of meaning, knowledge and action and to transform academic knowledge into teaching and learning in order to achieve high quality education.

This research describes one pilot-project in teacher education, which uses forest and a nearby science centre as a learning environment. This project breaks away from the traditional concept of a curriculum unit, disciplines, knowledge-based and teacher-centered instructional strategies, by challenging students to evaluate their attitudes to forest and their concept of future teaching. The main idea behind this is that teachers need direct guidance and their own personal experiences so that in practice they can build powerful learning environments at school (Reigeluth, 1999).

Perceptions and Relationships to Forest

The Finnish national economy as well as the livelihood of the rural population, has been predominantly based on forestry. The forests of Finland have been freely available to society, for use to satisfy society's changing needs. The use of forests has diversified in the 1980s. Parties concerned vary from those representing the interest of forest economy to others whose interest is conservation, hunting, tourism and hiking. (Rannikko, 2008.) Forests also sustain many cultural, spiritual and religious practices. It is obvious that forest affects most Finns in one way or another.

Environmental perceptions are important aspects in the development of an environmental relationship; the relationship to forest being one of them. According to Alerby (2000), these perceptions come to exist through sensual perception and previous experiences with age, accumulating knowledge and experiences will also help to focus on them. In the study of Finnish people's relationship to forest, Eloranta (2000) found that mostly pupils describe forest through its physiological and ecological elements, also providing opportunities for physical exercise. Because sensitivity is based on emotions which include empathy, knowledge is less important in the construction of a relationship to nature. For this reason, students who have a strong emotional relationship to the forest, wanted to protect it more than others (Eloranta, 2009).

Young people get most of their knowledge (72%) about forest from school and their

parent's influence is decreasing (Suomen Metsäyhdistys, 2006). The main problem is that the main way of dealing with the forest-context, is through textbooks indoors (see Suomen Metsäyhdistys 2007, Salmio 2008). Students' environmental information is therefore based on texts and the teacher which does not necessary increase awareness and sensitivity about nature and forest. Learning takes place in classrooms and visits to forests have decreased (Suomen Metsäyhdistys, 2007). Only 18 percent of pre-primary teachers and 39 percent of primary school teachers, have visited a preservation area or a national park with their pupils, during the two years under observation. The forest as a working site, has been visited even more seldom (about 20 %). In conclusion, it seems that the forest as a learning environment is not an obvious choice, despite Finland being quite densely forested. Although forest-based knowledge is taught at school, there is a risk of it being fragmented (see Eloranta, 2009).

Finnish children mainly describe forest as being an interesting (43 %) relaxing (37 %) environment for its beauty, plants, animals and the freshness of the air and only nine percent of children think of forest as frightening (Eloranta, 2009). According to Aura, Horelli and Korpela (1997) Finnish people consider that forest offers a stimulating environment for them. Most Finns appreciate forest for its natural value, there do seem to be a few who do not appreciate it at all (Eloranta, 2009). Children's forest survey results (Suomen Metsäyhdistys, 2006) are parallel to Eloranta's (2009) findings. In Eloranta's study (2009), the main reason children had for visiting a forest was physical exercise (33 %), followed by berry picking (girls), a day-trip environment (boys), admiration, doing something different and play. In the six graders' life forest was mainly described by concrete and everyday aspects, and the viewpoint was individually constructed. In winter-time, 25 % of the children did not visit the forest at all especially in closely populated areas (Suomen Metsäyhdistys, 2006). In conclusion, over 60 % of Finnish six-graders see forest from an economical aspect, 20 % from an ecological aspect and less than 20 % from a social and cultural aspect.

In international literature, people's relationship to forest has been even less studied despite the fact that forest use is a global issue ranging from the rainforest to the coniferous forest zone. Some research has been performed both on forest professionals' perceptions and attitudes concerning forest use and protection (Berninger, Kneeshaw, and Messier, 2009, Primmer and Karppinen, 2010) as well as those of rural people (Öztürk, Sağlam, and Barli, 2010; Ifegbesan, Pendlebury, and Annegarn, 2009). The role of forest is also dependent on the local culture. For example, recreation, quality of life, quality of environment, survival of life forms and the country's economy were perceived as more important in South Africa than Nigeria, reflecting the reality of conservation interest of the country (Ifegbesan, Pendlebury, and Annegarn, 2009).

Forest and the Forest Museum as a Learning Environment

Learning in general is not only concentrated inside schools but also outside, in science centres for example. Forest issues can be studied in a Forest Museum such as Lusto in Finland which, together with the Finnish Forest Research Institution's forest, form the context of this study. Lusto Forest Museum (see www.lusto.fi) and the nearby Finnish Forest Research Institution, promote forestry knowledge in different forms, although mainly through exhibitions. Study packages for school children are also available and give ideas as to how teachers can structure a study entity concerning forest.

It is important to note that people's memories of museum visits are strongly linked to the sights, sounds and even smells encountered (Braund, 2004) and this is an important fact when designing learning opportunities for different kinds of learners. Several studies have examined learning in informal contexts such as museums and science centres. Osborne and Dillon (2007) argue that it is even twice as difficult as studying learning in formal schooling and

that capturing the data is fraught with problems. Bishop and Reed (2005) however, found that students, who engaged in activities at the science centre, developed an enhanced knowledge about the science content. Correlations between the learning outcomes and the visit may not be sufficiently clear. In attempts to solve this problem, pre- and post tests concerning scientific facts have been used (see e.g. Heard, Dival, and Johnson, 2000). The lack of a theoretical framework designed for studies at science centres, has also been criticized (see Davidsson and Jakobsson, 2009).

Museums have extensively designed educational material on their websites. This material can be used before or after the visit; learning in science centres is best facilitated by significant preparation in schools prior to the visit and afterwards, through the use of follow-up activities. For example, Brickell and Herrington (2006) have developed a model of learner engagement, that places the onsite excursion in the context of a three-phase process integrated to an authentic inquiry-based task – a pre-visit phase in the classroom environment, a fieldwork phase in the excursion environment and a post-visit phase in the classroom environment. They state that in this context, the onsite work takes on a new significance. The teacher's role in this process would be to create an authentic problem or task for students to complete over a sustained period of time.

Visitors' previous knowledge, motivations and expectations, as well as a degree of choice and control, have been found to influence learning in museums (see e.g. Falk 2004), its features being voluntary, self-discovering, and self-determined. Most informal learning such as that in museums, is embedded in a social context. The socially situated learning activities are loosely structured, learner directed, and mediated by peers who often share the same values, attitudes, interests, and beliefs (Boekaerts and Minnaert, 1999). Marion and Reid (2007) found that most visitor education methods have the intended affect on visitor knowledge, attitudes, behaviour, and/or resource conditions, when brochures, a slide show, a booklet, trailhead signs, programs, trail days and a computer program were among the methods used. With both school children and adult visitors, the nature of the activities in science centres has a great influence on the learning. Effective outdoor learning should be situated in the history, ecology, culture, and stories of the place where it happens (see Beames and Ross, 2010).

In this study teacher students' visit to a forest and forest museum are presented, focusing on their view of their relationship to forest as well as their perceptions about its use in their future life and teaching profession.

Methodology of Research

A case study approach was used. This aims to understand the subject under focus in depth in its natural setting, recognizing its complexity and its context (Punch, 2009).

The Context and Participants of the Study

All the first year teacher students at the University of Eastern Finland's Savonlinna campus who study in the School of Applied Educational Science and Teacher Education take part in an orientation course for university studies (three credits). The field trip to the Finnish Forest Museum LUSTO and the Research Park of the Finnish Forest Research Station, is a part of that course. The trip is intended firstly to introduce the forest oriented theme into our teacher education and secondly, by completing a questionnaire in stimulated circumstances to encourage young students to think about the challenges of changing education and their relationship to forests. The third objective of the trip is to enable the formation of groups and present an opportunity for students to ponder on the knowledge and experiences shared during the first hectic week.

Forest field trips to the Forest Museum and Research Park were started in 2009. Students are annually divided into three groups according to their study orientation. Trips start from Savonlinna campus by bus to Punkaharju. The forest theme and the point of the questionnaire are explained at the beginning of the bus trip when students fill in the first part of the questionnaire. The first stop of the trip is at the Forest Museum Lusto. There students get brief information about the museum and our common projects before independently looking around for an hour. This is followed by a four kilometer guided walk through four to five cultural, economical and ecological information points where we stop to discuss the particular subject in question. The walking trip ends with a lakeside lunch. The second part of the questionnaire is filled in outdoors after lunch and collected during the return journey to Savonlinna.

There were 117 teacher students participating in the pilot study of 2009: pre-primary school teacher students, primary school teacher students, and teacher students of craft or home economics.

Data Collection and Analysis

The data was collected by a questionnaire which comprised of both open and closed questions. The questionnaire consisted of three parts: questions to be answered before the visit to the forest, during the visit, and after it. Before the visit, students had answered background questions concerning their previous experiences in the context of forests. They were also asked to answer questions about what they expected from the visit and how they felt beforehand. After the visit, students answered two open questions: How could forest benefit your life? How could you benefit from forest in your future teaching position?

The qualitative data was analyzed using content analysis; the open questions were carefully examined and interpreted for their themes and meanings. The categories that emerged within this analysis are presented in Figures 1 and 2. The case study approach focuses strongly on validity and this has been assured by using two researchers working independently. Both of them analyzed half of the data and comparison of the interpretation, revealed its uniformity. The other researcher then continued analysis of the rest of the answers in line with the common interpretations. The particular case understanding can be used as a basis for hypothesizing into the more general perceptions or relationship students have to forest, or possibly into outdoor learning. The reliability of the results can be assessed by comparing them with earlier studies.

Results of Research

Relation to Forest

Before visiting the forest, teacher students were asked to rate their relationship to it on the scale from one to five, five being very important and one, totally unimportant. Most of the students considered forest to be either important in their life (4; n=56; 48%) or very important (5; n=37; 32%). Thus for 93 students (79%) out of 117, forest is important. For 22 students (the value of forest was not so important (3; n=22; 19%), and two students (less than 2%) thought that forests are not important at all for them.

Forest in My Future Life

When the students were asked after their visit to the forest, how it could benefit their life, they mostly highlighted the meaning of forest as a place for recreation (n=94) (Figure 1).

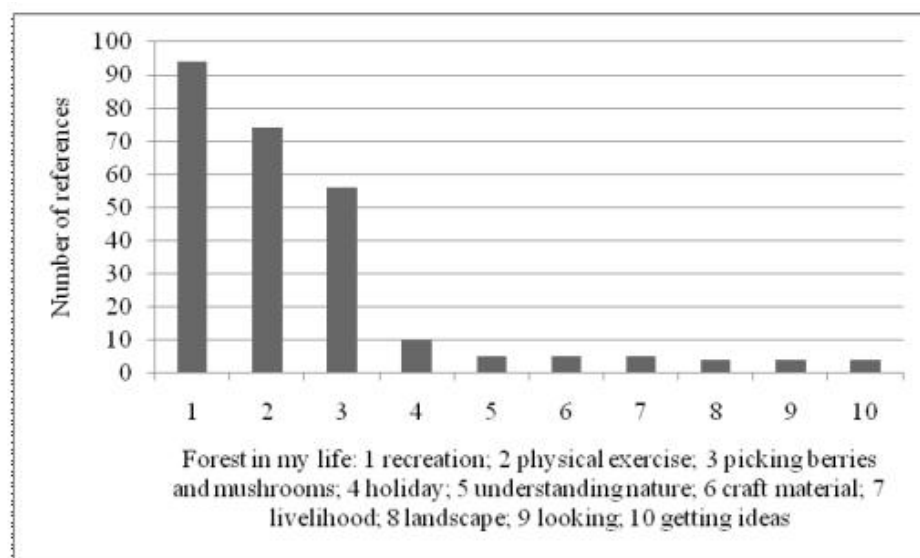


Figure 1: Teacher students' perceptions on the role of forest in their future life.

Teacher students perceived forest as a place where they could relax, slow down, be quiet and then be rejuvenated. Secondly, they pointed out forest as being a place for healthy recreation (n=74). They mainly referred to physical exercise or hiking but also skiing and the use of snowshoes was mentioned. Thirdly, the students were of the opinion that in the future they would also pick berries and mushrooms (n=56). Those who were already used to picking berries and mushrooms wanted to continue to do so whereas those who were not yet used to picking berries and mushrooms, planned it for the future. One of the students preferred to have other activities and feelings when in the forest and wrote that berries and mushrooms can be bought in the market. Eight of the students hoped to sometime have a cottage in the forest and one student wanted to lead a life in the wilderness and one make holiday trips in forests. Five descriptions concerned learning to understand nature, to respect it and its protection. Five students pointed out the importance of forest as a source of craft material. Another five saw forest as his/her future source of livelihood or investment, which was seen to be a reflection of their parents' livelihood. Forest landscape was mentioned by four students who described it as national landscape and four others thought that forest would be a source of ideas and inspiration for them.

Most of the teacher students described several viewpoints of forest in their future life. One female craft student wrote;

Doing exercise or walking in the forest is nice, because there it is possible to think at one's leisure. In a familiar forest it is also nice to follow the changes which take place.

Another female craft student thought about the future;

You can find a lot of material for craft and handiwork in the forest and berries and mushrooms are good nutrition. Walking outdoors is good for one's daily mental health and physical condition.

One viewpoint was the future use of wood;
I will use wood for heating my detached house.

The same student continued;

I will collect lingonberries, raspberries, blueberries, mushrooms, cloudberries etc. Moving around in the forest calms one down and gives energy; there one's batteries are recharged.

One male primary school teacher student spoke of forest as a livelihood.

The forests which the family owns act as an economic commodity.

On the whole, students' descriptions of the future role of forest in their life were very similar, although there were also some personal descriptions. One female primary school teacher student highlighted her own personal growth as a human being.

Forest is a good tool for challenging oneself. Meeting the challenges and overcoming them strengthens both trust in one's own abilities but also teaches humility.

Forest in My Future Teaching

Excursions to forest were described by teacher students as being a part of their future instruction (n=56) (Figure 2), however they did not describe in more detail what would happen during the excursion. It was described as being either a class excursion, camp school, a field trip or one lesson, or sometimes a day out to the nearby forest.

The teacher students described the use of forest at different levels; on the one hand mentioning details like plants and on the other the school subject of biology. Plants were in the second largest category referred to (n=35) comprising of students' mention of plants, wood, mushrooms, and moss. The students spoke of plans to visit the forest with their class, to see plants in nature, to put theory into practice, to compare the textbook picture to a real plant as well as to collect them. There were only seven mentions of animals but a variety of suggestions about learning from forest (n=34). The learning category concerns living skills; what can be eaten in the forest, recognizing dangerous mushrooms, and everyman's rights as well as learning to respect or protect forest, learning to know about forest in general, learning an ecological way to live and becoming familiar with forest's tranquility and as a place to relax. The students also highlighted moral education as well as learning to find oneself. Learning methods, experiences, observing and discovering were also grouped in this category.

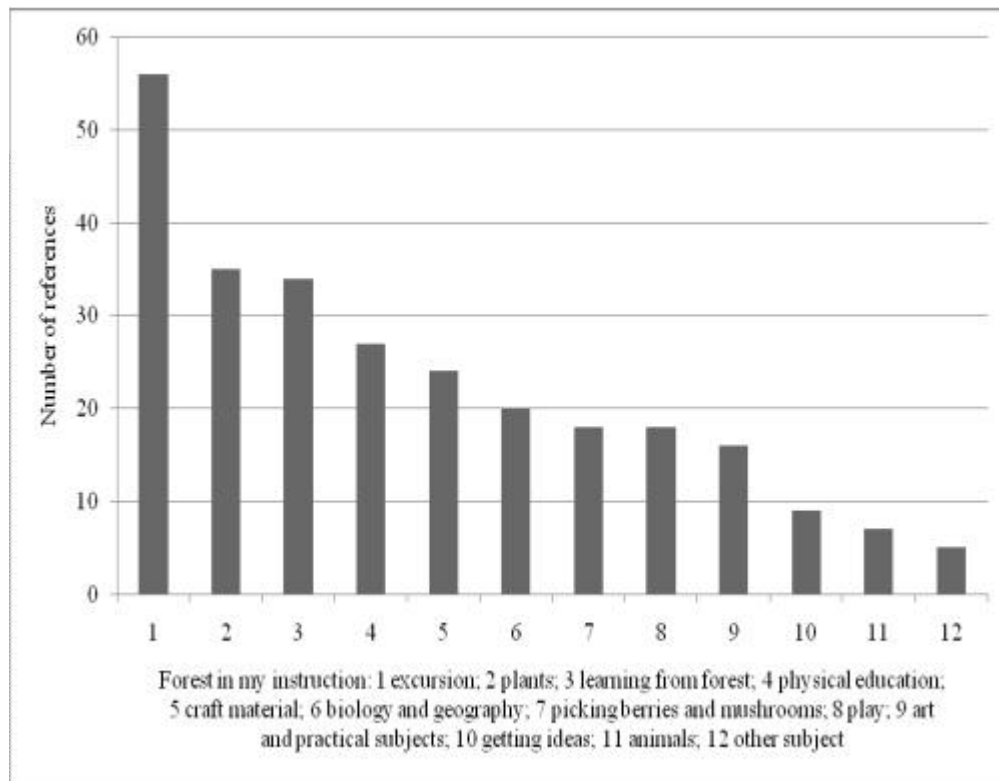


Figure 2: Forest in teacher students' future teaching.

In the case of school subjects, physical education was seen to be the most suitable to be taught in the forest (n=27). Orienteering was most often mentioned as an application. Other school subject groups which were seen to be suitable for forest location were biology and geography, or environmental and nature studies at the lower levels of comprehensive school (n=20), as well as art and practical subjects (n=16) including craft, visual art, and music. There were only five mentions of other school subjects; mathematics twice, health education once, history once, and the Finnish language once. Forest in instruction is also a source of raw material for crafts (n=24). Some students wanted to pick berries and mushrooms with their pupils (n=24). Plays were highlighted 18 in the form of stories, drama, role play, and also adventures and students said nine times that they would bring their pupils to forests to search for ideas or inspiration. Sounds from the forest such as bird song, were highlighted twice and twice there was mention of the senses. Only one student mentioned that the Forest Museum Lusto was a suitable place for instruction.

One female art-oriented primary school teacher student described the future use of forest in instruction as following:

I will use the forest as a learning environment for teaching plant, wood, or bird identification. Going on a picnic, for example or searching for inspiration and concrete models for visual art lessons. I will use forest in all possible ways.

Another female student from the same education program largely described the use of forest in instruction.

Nature is, in my opinion, a good learning environment; in good weather we can do mathematical

assignments on the spring grass. Nature is a place for observation in biology and geography lessons and where we can practice tranquility with pupils, pondering over things, physical training... also positive experiences in nature should be included among modern children's experiences of computers, televisions and mobile phones.

The male primary school teacher student wrote.

I can use forest as a learning environment in different subjects, for example, in physical education and sciences. In physical education, by orienteering pupils learn to read a map and use the compass: In sciences the forest can be used for identification of different species.

Discussion

Teacher students mainly spoke about forest in terms of tranquility, physical exercise, picking berries or mushrooms which revealed that their relationship to forest is strong and closely connected to recreation. Teacher students valued the social aspects more than sixth-graders (see Suomen Metsäyhdistys, 2006). In their future instruction relating to forest, students spoke of excursions, plants and learning in a multifaceted way. It is not possible to conclude whether they will really make excursions to forest in the future, or be amongst the pre-primary teachers and primary school teachers who very seldom visit preservation areas or national parks with their pupils (see Suomen Metsäyhdistys, 2007). It is hoped that the visit to the forest during teacher education, should encourage them to use it as a learning environment.

Teacher students' perceptions of forest as a place for recreation may make them willing to take their own pupils there. Also by encouraging students' own experiences during teacher education, may induce an eagerness to introduce forest to their pupils. Learning in forests was highlighted by students as learning for life; skills, knowledge, and values. The teacher students concentrated not only on the cognitive learning domain, but also on the other learning domains. This may indicate the teacher students' willingness to use constructivist instructional strategies and powerful learning environments to foster the full range of cognitive, affective, conative, and psychomotor outcomes in their forest-based instruction in the future (see Lombardi and Oblinger, 2007, Claxton, 2008). One focus in their future instruction was on learning generic skills which are in a key role in the order to succeed in future life (see Perkins 2002, 2009). The students considered forest as a learning environment, however they seldom gave concrete examples as to how to take advantage of it, perhaps being unable to modify the more authentic, more useful, and more contextualized learning opportunities of which Paris and Winograd (2001) as well as Perkins (2009) have spoken. At this point of time students perceptions and relationships were mainly described by concrete and everyday aspects (see Eloranta, 2009). We would therefore, like to remind the reader that the students in this study were first year students, thus they could not yet be expected to be able to plan learning environments. They have been afforded the opportunity to see how to connect learning with real-life contexts, and real-world problems and communities (see Rule, 2006) in order to implement a more extensive set of instructional strategies (see Paris & Winograd, 2001). It is obvious that teacher students need more guidance and own experiences so they can build authentic and contextualized learning environments in practice at school (see van Oers, 1998; Reigeluth, 1999).

Recreation has a bigger role in teacher students' descriptions than in those of sixth graders (Eloranta, 2000). The sixth graders mostly mentioned the physiological and ecological elements, whereas teacher students, recreation. Physical exercise was highlighted both by pupils and students. Our findings support also those of Eloranta (2009) who has concluded that those students whose emotional relationship is stronger, wanted to protect forest more than others.

Economic value was considered to be less important.

Teacher students saw forest as a stimulating environment, as a source of ideas and inspiration: this agrees with findings of Aura, Horelli and Korpela (1997). Only two of the students completely lacked appreciation for forest's natural value (see also Eloranta, 2009). Teacher students, especially women appreciated collecting the gifts of the forest and from the social and cultural aspect, students appreciated forest because of its associations with many life-related issues; it provided subjective well-being and a beautiful landscape to be enjoyed (see also Eloranta, 2009).

Conclusions

Forest as a learning environment is challenging and the purpose of visiting the forest during teacher education is one attempt to encourage future teachers to modify their instruction towards more authentic outdoor learning. Forest affords opportunities to learn skills, knowledge, and values; opportunities for **cognitive, affective, psychomotor, as well as conative learning**. Forest is an important issue globally but especially for Finns, and **familiarizing teacher students** with forest is also in line with the university's strategy as well as that of Eastern Finland. Even though the teacher students perceived forest in their life and instruction from several viewpoints, the perceptions were still quite traditional and did not take into account the multifaceted opportunities of forests. We will continue arranging visits to forest on the Savonlinna campus and also extend the activity to the Joensuu campus. This study presented the results from the pilot year 2009. The data from 2010 has been partly analysed, and it seems that it confirms the results of this study. It is important to further develop data collection methods and collect new data in the spring 2011 to clarify in more detail, teacher students' relationship to forest.

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