Pedagogical Outdoor Project in Nature Sloyd

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This study investigated the pedagogical value of a nature sloyd project. The assignment was to create the interior of and add decoration to one of the domed caves in a snow hotel dedicated to newlyweds. The theoretical understanding that led to solve the design assignment was derived from experience-based teaching. The students were interviewed during the process, and three months later, the interviews emphasised the students' experiences, cooperation, and learning and understanding of significant subjects in the process. The Nordic context added value to the project. To support the interview data, the researcher's memos and photos of the process were included in the analysis. The collected data were analysed in accordance with the constructing grounded theory method. The results show that feedback from supervisors and outsiders is important for maintaining motivation for a demanding outdoor project. They also show that the students were absorbed in the joy that various parts of the work process brought them, and it was new to them that ice can be processed with almost all types of tools found in a workshop for woodworking. Collaboration in lifting and constructing large structures using snow and ice made it possible for students to think in terms of a holistic design methodology. In such a way that the students reflected on didactic issues that may face them in their future profession as teachers. The results contribute to the understanding of the educational possibilities of pedagogical nature sloyd.

Keywords: pedagogical value, sloyd, design art and crafts, nature sloyd

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Introduction

This study is about an educational outdoor project in design art and crafts or, to be precise, about nature sloyd in teacher education. Nature sloyd is an action-based educational practice in which basic knowledge of design, art, and crafts is the starting point for a learning process. The nature-sloyd working process is based on the use of materials found in nature. The lifespan of these products can be short, as the product eventually returns to nature (Sandven, 2006, 2019). The task in this survey was to create a room for a newly married couple that communicated Nordic nature, culture, and myths.

Creating in nature is an important activity in Norwegian culture. In fact, it is highlighted in the curricula of primary and secondary schools (Utdanningsdirektoratet, 2020a). The curriculum for the school subject of art and crafts highlights pedagogical values about a lifestyle close to nature. Experiences of creative processes are linked to nurturing nature (Utdanningsdirektoratet, 2020b). Learners should be able to plan and construct materials from nature with inspiration from Sami culture and local building traditions. An educational value is self-sufficiency, which is the capacity to plan, produce, nurture, and renew things instead of throwing them away when they are no longer needed. Such a capacity is valuable for not only individuals but also society (Sandven, 2019; Suojanen, 1996; Utdanningsdirektoratet, 2020a). Thus, the intention of nature sloyd is to create positive emotions about being in and nurturing

nature. In this kind of process, the urge for creativity is expected to be expressed using the hands, through human interaction, and through problem solving.

Nature is a challenging arena of learning in which both the learner and the teacher need preparation and training (Sandven, 2019). Because of this, it is important for teacher students to have the opportunity to experience such a project. Further, as teacher education is research-based, research on the pedagogical value of nature sloyd is needed.

In this study, information on the students' experiences, cooperation, learning, and grasp of significant subjects was collected through focus group interviews during and after the project. The researcher observed the emotional atmosphere throughout the project and during the interviews and recorded this in memos and through photos. The question that guided the research was the following: What are the educational values of a nature sloyd project? The underlying research questions are as follows:

> What educational experiences and insights do the students gain through the project?
>
> Which skills do the students develop through the project?

Sloyd and Nature Sloyd

Design, art and craft is a subject in Norwegian basic education and consequently a subject in teacher education. This subject is related to the Nordic sloyd subject. The content of the sloyd subjects differs among the Nordic countries. However, sloyd educational ambitions and strong research cooperation create a common Nordic understanding (Johansson, 2022). It is the individual countries' policies that set the premises for these subjects. The concept of sloyd itself can be traced back to the 14th century (Nordic forum for research and development in craft and design [Sloyd]).

The didactics of the sloyd subject emphasise both the hand and the mind in the learning processes (Fredriksen & Haukeland, 2023; Haukeland & Sæterhaug, 2020; Illum, 2004; Ingold, 2013; Johansson, 2002; Kirketerp, 2020; Molander, 2016; Riis, 2016; Sandven, 2019). Nature sloyd is included in different ways and at different levels within the educational system in all Nordic countries (Ahlskog-Björkman et al., 2020; Borg, 2021; Sandven, 2021; Suojanen, 2001). An educational process in nature sloyd must, like other sloyd processes, proceed from the idea, through the acquisition and testing of skills and knowledge and result in, for instance, a product (Johansson, 2022). Reflection through action must be part of the whole process (Halvorsen, 1994; Johansson, 2022; Lindfors, 1988; Norberg-Schulz, 1988; Säljö, 2008; Schön, 2013). Ideally, the sloyd process not only gives new knowledge and skills but also initiates an educational process that enables to acquire general competence (Kirketerp, 2020; Sandven, 2021; Suojanen, 2001). The conclusion is that learning processes are often more important than the product (Nygren-Landgärds, 2000; Säljö, 2008). A prerequisite is that the reflective is considered. Creative reflective thinking requires commitment on a sociocultural level, in which both the learning of specialist knowledge and the execution of the work process play a decisive role (Olafsson, 2022).

Snow and ice leave their marks on large parts of the Nordic region. According to architecture professor Norberg-Schultz (1991), weather conditions lend a character to the Nordic countries and tell the world who the Nordic people are. In other words, the conditions of snow and ice form their lifestyles. Understanding feelings for cultural heritage, landscapes, and moods allow the Nordic people to deal with the winter. Shaping forms using snow and ice is an activity that occurs in schools, where such weather conditions make this possible.

Educational Nature Sloyd in the Winter Season

In Nordic countries, snow and ice festivals have become tourist attractions. This can be seen as an expression of their need to communicate with Mother Earth. The snow-covered landscape is authentically Nordic. Productive and creative processes in nature offer pupils the possibility of expressing dilemmas related to sustainability and the environment. Through these processes, they

increase their understanding of such dilemmas and their ability to act on them and address them (Stoll, et. all, 2022).

According to Curtis and Jokela (2008), when artists and craftsmen create together as part of an aesthetic process in a community, the quality of their output and their knowledge and creativity are enhanced. McWilliam (2008) showed that when people are exposed to different colors, forms, movements, and smells in nature, they become interested in exploring the environment. An outdoor project may develop closeness between its participants and the outdoor place where the project was organised. According to van Boeckel (2013), the path to wisdom is through actions and experiences in an open-ended process and in untouched nature. The key to successful outdoor teaching is as follows:

> To me, maybe the essential element of keeping up this idea of the real is to allow for a domain of the unexpected, of that which is not preordered, framed, or constructed. It is present, but it may catch us off guard or by surprise. We know it when we feel it. (van Boeckel, 2013, p. 401)

Sensing and practical experience in learning and knowledge acquisition is therefore an important premise when people are to learn something (Aristotle, as cited in van Boeckel, 2013). Learners need to apply all their senses, including smell, taste, and touch (Brügge & Szczepanski, 2018). The basis of learning is the learners' use of their knowledge to analyse and solve problems and to reflect on their own learning to gain a holistic understanding of significant subjects in the process (Kunnskaps–departementet, 2014, 2015, 2019).

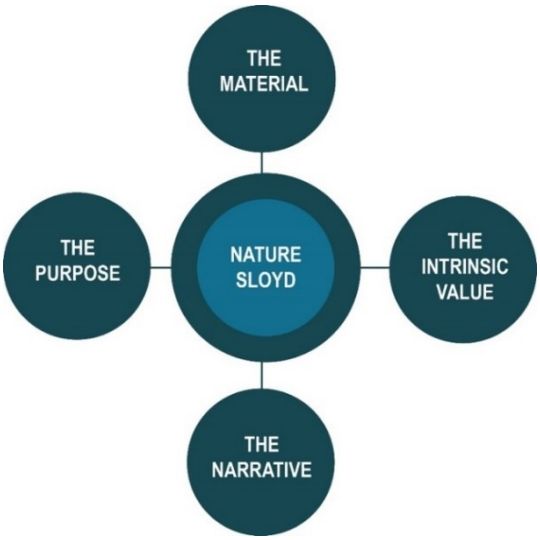
Theory About Nature Sloyd and Educational Values

In a previous study, the researcher developed a model of perspectives for outdoor teaching (Figure 1). This model forms a preunderstanding of the method of conceiving nature sloyd.

The model consists of four satellites, two axes and four sectors. The task of the work and the choice of learning strategy determine where in this model the student places himself. A placement in the sector between purpose and the material means that the mission is to acquire enough skills and knowledge to create an appropriate product that can satisfy others. The sector between the material and intrinsic value indicates attention to 'art for art's sake' and that experiments and play with materials and forms exist primarily to satisfy the performer. If one also alternates the narrative, is there a meaningful content to tell the viewer.

Figure 1.

Model Representing Perspectives of Nature Sloyd for Outdoor Teaching (Sandven, 2006)



Creative activity causes physical experiences when the students work towards a common goal. In the nature sloyd process, it is important for the students to understand that they are seen and understood by supervisor without presenting a cognitive interpretation of the experience. The joy of being in a creative process can otherwise be lost. In fact, Parviainen (2002) calls this kinesthetic empathy and describes it as the ability to live with another's kinesthetic sensations, which is also a form of 'understanding and seeing the students' (Parviainen, 2002, p. 147). The aim of the nature sloyd process is to give pupils the opportunity to learn to perceive, sense, and feel themselves while processing the material. This can be exemplified by the following statement: 'Now, I am one with the snow' (T.L. Bang, student, February 2006). Supervisor can participate with his affective and bodily experiences and actively use them to sense where the students are in their learning processes in the here and now to both support and mirror the student and adapt for further adequate learning. The teacher can 'feel-confirm' (Torgersen, 2021, p. 88) or physically acknowledge the students; they can thus support the students in feeling themselves in the learning process. This can be explained as knowing through the body.

Methods

The research was conducted as a case study (Heale & Twycross, 2016) with an inductive research design (Liu, 2016). The research data were collected from semi structured focus group interviews (Gulliksen & Hjardemaal, 2014) and the researcher's memos and photos (Mohajan & Mohajan, 2022) of the process. Group interviews were chosen to enable conversations between the students and the teacher as an extension of the work process. The assumption was that a reflective discussion in the aftermath of the day working would deepen the results of the learning process (Sandven, 2019). To document the emotional atmosphere and the different reactions that were visible during the nature sloyd process and during the interviews, the researcher noted observations on memos and took photos. In such methods, for instance, the researcher could divine the relations that arose between the students and how the students interacted with the teacher and the supervisors during the process and with each other during the interviews.

Data were analysed considering theories from a constructivist perspective (Moses & Knutsen, 2012). During the work on the bridal suite, the students were challenged socially, academically, and personally. The students were challenged academically since the situation facilitates them in developing values that are laid as the basis for their personal identity and future role as a teacher; indeed, the situation involves transferring knowledge to new pedagogy, because of a new learning arena (Argyris & Schön, 1996; Jenssen & Nordahl, 2022; Robinson, 2018). It is assumed that the focus interviews can reinforce basic assumptions about teaching (Sandvoll et al., 2017, p. 297).

Context of the Study

The phenomenon being analysed is related to a Nordic nature sloyd course in Lainio Snow Village, which is 100 miles north of Rovaniemi in Northern Finland. Students and their teachers from teacher education institutions in Finland and Norway participated in the course, which lasted eight days. Two teachers from the University of Lapland oversaw the course. Further, experienced local craftsmen were available for the course (Jokela, 2003).

The students chosen to join this survey had experience with outdoor educational activities as students from Norwegian teacher education. They came from the same teacher education institution in Norway but from different grade level. In addition, they did not know each other before. The students were chosen based on the researcher's knowledge of the students' work effort.

Before the work started in the snow hotel, an introduction was given to the artists' work related to site- and environment-specific and community art. Two months before the work in Finland started, the students learned that the theme of the work would revolve around Nordic cultural heritage. Sketches

were presented in a plenary for comments from supervisors and other participants on the course before the work started. During the project, the students had the opportunity to observe how the craftsmen worked with ice and snow, their tacit know-how, their use of tools, how their work process unfolded, and how they made furniture for the communal rooms in the hotel. The learning arena of the course was, at first, a bare, cold, and dirty snow cave. Subsequently, the cave was transformed into a room where the exterior, the light, and the design became part of a narrative story on Nordic Arctic culture (Figures 2 and 3).

Figure 2.
A Student Working with Snow and Ice (the Researcher's Photograph)

Figure 3.
Learning Arena Transformed into a Bridal Suite (the Researcher's Photograph)

The project was mostly implemented in the snow cave. However, the students had to bring snow and blocks of ice from outside under the dark Arctic winter sky. This experience could develop the students' ability to see the holy in the wilderness as according to architecture professor Christian Norberg-Schulz is localised in places, the climate, and the time (Norberg-Schulz, 1991). Because the culture and surroundings were foreign to most of the students, it was likely that they would experience Arctic nature as special.

Interviews

The interviews were conducted as semi-structured focus group discussions (Gulliksen & Hjardemaal, 2014). The method was chosen as a unique opportunity to capture the individual's and the group's reflections on the day's challenges related to body-oriented, mental, and design-oriented work in the snow cave. Three months after the work in the snow cave was finished, a summary interview was conducted. The supplemental interview lasted two hours. All interviews were recorded and transcribed. Finally, the interview data filled 49 pages of written text.

The questions were the same night after night and were always preceded by the following: how has your day in the snow cave been? Because the day's work varied significantly from the day before, the narrative was always different. Furthermore, attention was focused on the supervisor's role, the students' feelings about the place, and the work's progress that day. During the conversation, key concepts, such as flow, community art, and site-specific art, were discussed. The awareness of concepts also changed day by day, as the content was experienced different in the work in the cave. Thus, for example, the term 'flow' could emerge as a comment from one of the students after the focus was placed on the work, and only the sound of the work process could be heard. Such situations were included in the investigator's memo. Finally, the conversation turned to Figure 1, and the students' reflections on the day's activities. By using Figure 1, concepts were assigned content, and the relationship between the four satellites was discussed and constructed. The model helped the researcher systematise what the group was doing and what they emphasised on different days.

The model presented in Figure 1 is a constructivist tool. In the interviews, the model was used as a point for the conversations, knowing that it was constructed based on philosophical, didactic, and social influences (Solli, 2021). The students became familiar with the model and used their experiences as a basis, which nuanced where on the axes and sectors they were after the day's work.

Memos and Photographs

To document the emotional atmosphere and different reactions that were visible during the art and crafts process and during the interviews, the researcher drafted memos and photographed events and artefacts (Mohajan & Mohajan, 2022). Memo writing and photography also functioned as early methods of data coding in the research process (Charmaz, 2014), as the researcher could determine the relations that arose between the students and how they interacted with the teacher and the supervisors during the process. Further, memos and photographs support the interviews and offer the researcher and reader an understanding of the work process and the finished work.

Qualitative Analysis

'Basic Grounded Theory strategies use coding, memo writing, and sampling for theory development with comparative methods because these strategies are transportable across epistemological and ontological gulfs' (Charmaz, 2014, p. 12). Charmaz (2014) was inspired by the grounded theory method and developed a method of constructing grounded theory (CGT). "The main difference between CGT and Glaser's and Straus's (1967, as cited in Charmaz, 2014) statements about grounded theory is as follows: 'I took the term constructivist to acknowledge subjectivity and the researcher's involvement in the construction and interpretation of data and to signal the differences between my approach and conventional social constructionism of the 1980s' (p. 14)."

In the analysis process involved in CGT, data are coded into categories and dimensions (Eneroth, 1984). Charmaz (2014) notes that 'through coding, we make discoveries and gain deeper understanding of the empirical world' (p. 137). The analysis of the research data in this study was conducted based on CGT. In addition, the constructivist approach (Mills et al., 2006) was used to emphasise flexibility and sensitivity in the collection of data. The aim of the inductive research process (Liu, 2016) is to produce

relevant answers to the research question and new knowledge from the data by discussing the research results through earlier studies (Anttila, 2000; Braun & Clarke, 2006; Charmaz, 2014).

The CGT method is in this survey not a linear process. The coding starts with experiences from previous works (Sandven, 2006). Results of the coding show the way forward in the research process, as the findings from the categories, as well as the dimensions, are cross-referenced and compared (Charmaz, 2014), when new data from the students work and the focus interviews are obtained. Each dimension has its own qualitative insights and qualities that give the categories meaning. Thus, the categories are decisive for creating scientific concepts and interpretations. The process is compared to putting together a puzzle and the strategies used to construct the puzzle's final image (Anttila, 2000). Taking the focus away from the details, the different categories are expressed as presumptions. But it was the investigations in the nature sloyd that laid the foundation for interactive strategies of going back and forth between data and analysis, uses comparative methods, and keeps interacting and involved with the data and emerging analysis' (Charmaz, 2014, p. 1). In a circular analysis process, in different phases of the research process, early results must be combined and related to each other. Knowledge must be formulated when the results are both in relation to each other and separate from each other. As key insights can arise at any point throughout the process, it is important to write memos throughout the process. This method requires not only the creativity of the researcher but also their ability to think analytically about the reflections of other research results (Anttila, 2000).

The analysis process was conducted in four phases. In the first phase, the data were coded to form a preliminary impression. Initial coding led the researcher into the data material (Charmaz, 2014). To form an initial idea of the data, Sandven's (2006) model was used (Figure 1). The analysis provided a theoretical understanding of the data and added substance to the concept of natural sloyd; however, it did not enlighten the researcher on the challenges and opportunities that the practitioner faces in the process.

This analysis then proceeded to a focused analysis. The level of abstraction increased as the analysis was performed with a sensitive and open-minded attitude (Charmaz, 2014). In this survey, which is based on CGT, it is a prerequisite that the researcher notes what happens to the participants when they get tired, when they get feedback and when they themselves feel that they together have succeeded in creating. By grouping and delimiting dimensions, the analysis can obtain a tool that can provide answers to the survey's research question. The researcher's memos and photos were important in this analysis phase, as they contributed value and insights when the data were interpreted (Anttila, 2000; Charmaz, 2014). The analyses resulted in six categories: large constructions, formal aesthetic factors, collaboration, artefacts, tools, and local materials. The categories were analysed in relation to the research questions. This led to the exclusion of two categories – large constructions and formal aesthetic factors – as they did not provide answers to the research questions.

In the third phase, the categories collaboration, artefacts, tools, and local materials were analysed and related with these dimensions: context of learning, flow and joy, mastery, traditional tools, language, knowledge, skills and general competence, self-consciousness, belonging, and the observer's feedback. Following this, the dimensions of the categories were compared, and dimensions with similar content built new categories. An example is dimensions that fit together and reinforce the dimension observer's feedback. The category was named motivation. The analysis process was a result of the reduction of categories and dimensions due to sampling in which dimensions were moved from one category to another. The new categories were the capacity to create, mediation tools, and motivation. This analysis strengthened the understanding of data (Charmaz, 2014), as it changed from evaluating what nature sloyd is to which educational experiences and skills the students developed through nature sloyd.

In the last phase, the categories were re-analysed into new dimensions by extracting keywords and comparing them with the meaning of the category. Table 1 presents the final categories and dimensions. The dimensions are described and exemplified by quotations in the text below.

Table 1.
Final Categories and Dimensions of the Analysis Process

Categories	Dimensions
Capacity to create.	Context of learning
	Flow and joy
	Mastery
Mediating tools	Traditional tools
	Language
	Knowledge, skills, and general competence
Motivation	Self-consciousness
	Belonging
	Observer's feedback

The data collected from a group interview three months later were related to the same categories so the researcher could reproduce the content of the data in a comparative manner.

Reliability

CGT does not emphasise requirements for validity, as the method recognises subjectivity and the researcher's involvement in the construction and interpretation of data (Charmaz, 2014). Charmaz's approach to constructionism differs from the conventional understanding in that it accepts subjectivity in the data collection but demands abstraction in the data analysis. A prerequisite is that the analysis method utilises the transcription of data. By rereading, the researcher can check and find new ways of coding their data. What is equally important to this task is the researcher's ability to relate to building artefacts. In this survey, it is the decorations, door portal, bed, and the podium, as well as the lighting of the room. The requirement for credibility in relation to the survey's findings is justified by the fact that the assignment was a joint project between the students and the researcher, and that the researcher could check the students' answers based on their memos. More extensive field studies or the recoding of existing data could have yielded other research results (Heale & Twycross, 2016). However, as the interviews were conducted every day during the course and three months after the course, the data offer both breadth and depth. According to Lincoln and Guba's (1985) criteria for validity, this examination of the process in these field studies cannot be repeated, as the variables in nature sloyd projects are many and linked to individuals. However, the fact that the survey is based on an experienced reality increases the credibility and reliability of the survey.

Results

The students' thoughts from the focus group interviews (FGI) were described in three categories and nine dimensions. The quality of the dimensions was described through quotations. The researcher translated the quotations from Norwegian to English. The memos and the photos of the researcher were used as added information to the categories and dimensions.

Category 1: Capacity to Create

The group's work ethics and perspectives on teaching were revealed through the interviews and the researcher's observations. This category is described using three dimensions: the context of learning and teaching, flow and joy, and mastery. Figure 4 illustrates the category's capacity to create and highlights the content of the category.

Figure 4.
The Northern Lights Carved into Snow (the Researcher's Photograph)

The northern lights created by sawing vertical patterns on the cave's dome with a chainsaw. Ice blocks with carvings were 'glued' onto the artificial snow in the cave dome using ice slush. To create [a] rhythmic contrast in the vertical patterns, the lengths of the poles in the snow and ice were varied. The depth effect was induced using light filters (The researcher's memo).

Dimension 1: The Context of Learning and Teaching

This is based on the social construction of knowledge. Here, the assignment became a prerequisite for the group's construction of meaning and understanding, as seen in the following quotes from the interviews during the project: 'I feel like I've had a lot of extrinsic motivation today. It was perhaps something more towards purpose than towards intrinsic value' (Focus group interview [FGI]: S.E. Kjølstad, day three).

The next quotation focuses on the distinctive competence of the participants and their experience-based knowledge during the process:

> It was different from what we were used to at school: a different work context. We were all at the same level, students, and the teacher alike. It was fun to cooperate while feeling that one is in the right place at the right time, doing what one loves (FGI: S.E. Kjølstad, three months later).

Dimension 2: Flow and Joy

This dimension describes a state of joy and total involvement in which problems seem to disappear, and an exhilarating feeling of transcendence is experienced (Csikszentmihalyi, 2002; Kirketerp, 2020). The following quotes exemplify this dimension:

> The time limit made the workflow necessary, and we depended on each other to succeed. The job was too much for only one person to do. By being immersed in a flow, it felt as if the though [*sic*] work was less toilsome, and we managed to work for longer time spans (FGI: S.E. Kjølstad, day eight).

Emotions such as joy, pain, and frustration, in a creative process, tend to go together and are not easy to separate afterwards, as the following statement suggests:

> In the aftermath, our feelings are directed towards the whole project, which makes it difficult to look back at what happened in the present moment. Wow, we were in 'flow' during the whole project, and everything was fine. The time certainly flew. Although it was tough and we stumbled upon problems, all in all, we had a feeling of 'flow' (FGI: S.E. Kjølstad, three months later)

Joy in movement and construction in nature sloyd shows the ability of individuals to move and use their bodies when larger structures are built, during which a major individual oversight could occur (Kirketerp, 2020). This is exemplified by the following quotes: 'Some parts of the project were so challenging that we forgot to eat dinner. We worked and lived in the same spot, in a bubble in which we did everything together' (FGI: M.H. Olsen, day two). There was nothing to say about the work effort and the will to complete the project.

The activity in the snow cave also served as physical education, which was important for the original sloyd in Nordic countries (Kjosavik, 2001):

> The blocks of ice that we were going to use around the bed were sawn with a chainsaw outside, where there was only daylight for a few hours a day and [it was] bitterly cold. The blocks were operated one by one and moved up onto the sleigh and dragged into the cave. Maybe we felt like the Egyptians when they built the pyramids – [the] experience of the beautiful, right movements, joint efforts, and making large sizes fit together (The researcher's memo).

Dimension 3: Mastery

This dimension describes the ability to solve problems and think in new directions (Kunnskaps–departementet, 2014, 2015). This dimension also claims that mastery may lead to creativity and can be learned through training. The subject of art and crafts is an important training arena that transfer value to other subjects and to development work (Olafsson, 2022). The students expressed this as follows: The work process ran automatically. Even if it felt challenging there and then, it later felt as if one was being drawn into a torrential current in a river (FGI: S.E. Kjølstad day four).

One of the students got to use his new experiences of working in snow and ice shortly after his stay in Finland: 'I got to try my new knowledge a month later when I was at a snow festival in Vinje, Telemark. I noticed that I had a lot of competence compared to the other participants' (FGI: S.E. Kjølstad, three months later).

Moreover, the cave's forms were the workshop and gallery that offered the students framework factors. The three dimensions describe the meaning of the 'capacity to create' category. It was evident from the interviews that the students found the work pleasant. Their excitement in relation to the content of the category seemed to become more motivated when they reached the snow cave and received some tools and a framework for the task: Sketches were drawn and discussed. Choices were quickly made, and it

wasn't long before [that] charcoal drawings of the northern lights appeared on the cave's ceiling. (The researcher's memo).

Expectations to use the body in a creative, reflective act were high: Bodily expression is described as more than a medium. The day was intensive, and the students expressed that they were satisfied with the result of their work. New tools were presented for them to use, such as a chainsaw with a long sword and an electric rotary tool used to carve ice. (The researcher's memo).

The participants' emotional involvement steadily rose as the project neared completion. In the minds of the participants, they were now able to see what they had been involved in a mega-perspective.

Category 2: Mediation Tools

According to Alexandersson (2008), reality is mediated through artefacts. In nature sloyd, a participant is challenged to do something with the help of materials and tools. The category highlights not only the utilisation of traditional tools for snow and ice but also visual language and learning through knowledge skills and general competence.

Dimension 1: Traditional Tools

This dimension describes how the practitioner's hands are the most important tool in nature sloyd:

> Working with snow and ice with tools that become an extension of the body allows value and meaning. When the body becomes tired, the practitioner can gain a greater experience and understanding of the surface, dimensions, weight, expressive potential, and malleable properties of materials. (The researcher's memo).

The hands at the practitioner's disposal have a wealth of skills alone or with a tool and can be further trained to maintain the skills through repetition in a rhythmic process (Sennet, 2009). The following quote from the group interviews describes the students' work with what they called 'the magic tool' and the importance and meaning of proper tools when working with nature sloyd:

> We are accustomed to using chopping iron in wood materials. We were very surprised with [*sic*] how easy it was to work with ice. The right tools are the alpha and the omega if one is to have a pleasant experience. We have given one of the tools a new name. We have named it 'the magic tool'. We barely touch it, and nonetheless, it runs through the ice (FGI: M.H. Olsen, day four).

The tool with a long shaft and a width of 4–10 cm at the edge was to be used to cut – not chop – the ice and were developed by local craftsmen (Figure 5).

Figure 5.
Student Working With 'the Magic Tool' (the Researcher's Photograph)

Dimension 2: Language

This points back to representation marks in artefacts to which human characteristics were attributed. For instance, in what way can snow play a metaphorical role (Sennet, 2009)? The students expressed this as follows: I thought it was amazing to work on ice, to 'wash' the ice, and [to] look at the structures that were inside the ice. It made the ice something. … Working with snow and ice sculptures is [equivalent to] taking part in the culture of North Calotte. (FGI: T.L. Bang, day three). The project started by carving out 20 meters of undulating vertical forms in the cave's dome. Now it was time to insert ice blocks with engraved symbols: 'We have sourced materials from the site. Yesterday, we were working on what was already present. It was kind of like bringing something new in' (FGI: M.H. Olsen, day four).

Further, the northern lights were suggested as a metaphor and a premise for the cave's Nordic touch. The different artefacts formed an integrated story about the materials and narratives. With lighting, visitors could perceive how the different elements were part of a whole. In this way, it can be said that 'artefacts and technologies are consequences of and an impact on people's ability to learn' (Säljö, 2021, p. 191), and this is exemplified by the following quote from the group interviews: 'It was M. or T. [the supervisors] who said, "Whereas other participants thought.: about details, we had thought out the whole room right away"' (FGI: M.H. Olsen, day eight).

In other words, the experience of the room's layout was decisive in the design of its interior. Details were planned to form wholeness and coherence. The engravings depicting the artefact (which is the northern lights) on the cave's ceiling guided the selection of designs for the bed, platform, and entrance portal. The source of light was placed under the bed, where the light went through a blue filter and thereafter through the ice blocks. It created a colored dome in the cave.

Dimension 3: Knowledge Skills and General Competence

This form of learning is described as holistic design thinking in Norwegian policy documents (Utdanningsdirektoratet, 2020b). This is exemplified by the following quote from the group interview three months after the project: 'One can, in fact, form the ice and the snow. It is right on point: we did this, and we learnt this' (FGI: S.E. Kjølstad, three months later).

There is reason to assume that the process of creating forms was understood as part of a range of aesthetic factors and as the essence of what the group perceived as the northern lights in a mythical Nordic landscape. The design expressed moods communicated through form and color in the ice and snow. Figure 6 shows how the arch above the entrance indicates that it is part of a carrying structure standing on columns of ice. The arch touches the line of the northern lights. This, with the engraved patterns, refers to both an expression of nature and symbols of folk culture.

Figure 6.

Norwegian Folk Culture Signatures Engraved into the Ice Columns and the Touch of the Northern Lights (the Researcher's Photograph)

In the sloyd process, the dimension appears linked to tradition, renewal, and innovation so that individuals can regard themselves as responsible citizens (Säljö, 2008, 2021). In addition, an individual can acquire an interesting, intellectually stimulating assignment in sloyd depending on how they understand and exercise basic skills.

Problem solving is based on the known ability to renew and further develop an artefact or design concept. The sloyd process can, at best, increase the pupils' self-understanding by helping them acquire competence. The dimension, knowledge, skills, and general competence, describes the ability to produce forms with ice and snow and to collaborate with other in the group. These competences are not static concepts in the nature sloyd process; however, over time, they can develop into a free and infinite process that concerns values and education [in Norwegian, this process of development is called dannelseprosess] (Kaufmann, 2006; Säljö, 2021). This is exemplified in the following quotes:

It gave us a lot of practical knowledge and the desire to continue with [the process], maybe by having these interviews and lectures that [*sic*] we think more about what it can be used for. Don't just take students out into the snow and make something, but [think about] what it can be used for beyond that – 'what snow can give students to work with' [*sic*]. (FGI: T.L. Bang, day seven).

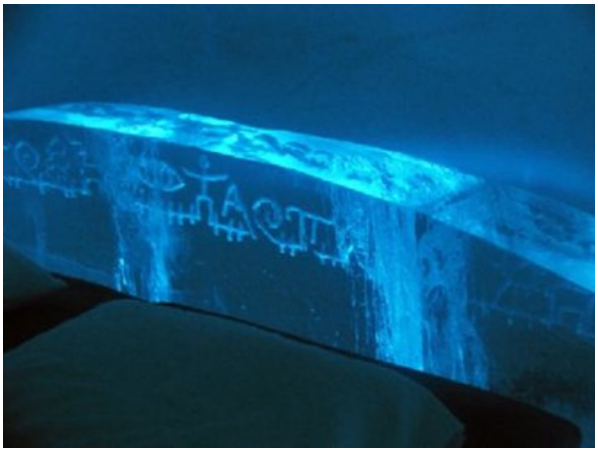
According to Säljö (2008, 2021), cognition and materiality are interdependent. Humans learn and understand through socio-material tools in all subjects, not only art and crafts. In other words, learning is a creative, evolving, and problem-solving process. The mediating dimensions that were taken as starting points can open the path for questions concerning values and education. In the group interview conducted three months after the end of the project, the students discussed the relationship between their learning and experiences: 'During the education, we have been through many materials and techniques, so we know what it takes for students to have good experiences' (FGI: S.E. Kjølstad, three months later).

A lecture on place-based art at the start of the project led to many good and unexpected conversations:

'I have understood more about place-based art than I ever knew. I feel this is interesting, and I have more skills to work with snow and ice than before' (FGI: M.H. Olsen, three months later).

Furthermore, the group managed to use stories that they wanted to communicate through the design of the cave. (Figure 6 and 7).

Figure 7.
The Narrative Is Engraved in Ice (the Researcher's Photograph)



There is reason to assume that knowledge in action is regarded as an experience, whereas learning is something that participants accomplish when they have time to reflect on and converse with themselves as well as others. Tools can be physical; however, they can also provide them with a way of thinking or a method of working. This must be considered to understand the students' amazement with 'the magic tool', which was believed to materialise ideas: It is [the] alpha and omega to have a positive experience because we cut like in [*sic*] butter. We've renamed one tool. We call it 'the magic tool'. We think it's magical. We can just look at it, and it slips through (FGI: S.E. Kjølstad, three months later).

Practitioners that this group represents want to get started quickly with their concrete work. Being hindered by lectures can feel disturbing but can also provide new ideas along the way when the work gets underway: The project has given us practical skills, and because of the interviews and lectures, we have thought more about how such projects can be used in schools and in the subject art and crafts (FGI: T.L. Bang, three months later).

Therefore, the tool became a symbol of the realisation of the group's ideas. Learning how to use a mediating tool and using it can create feelings of excitement, high spirits, and new insights when a material is given form.

Category 3: Motivation

This category concerns internal psychological needs. The description of the category is presented by the following dimensions: self-consciousness, belonging, and the observer's feedback.

Dimension 1: Self-Consciousness

This dimension assumes that performers have the courage to implement their ideas about how the space should be shaped. The courage to act depends on repeated success stories (Bandura, 1996; Kirketerp, 2020; Sennet, 2009). The students expressed this balance in relation to their need to complete the assignment: In a way, I think it's good enough not to have the supervisors all the time by our side to say such and such and think so and so. [It is] good to grab them when we need them (FGI: T.L. Bang, three months later).

Problem-solving work is closely associated with self-regulation as a method of working and acquiring self-consciousness. It is easy to lose motivation to develop alternative design proposals if time is exhausted before ideas can be implemented. On the one hand: 'When you know [the nature sloyd process] is starting, you have butterflies in your stomach, and you see so many examples of what can be done and are eager to start yourself, but then, the time drags' (FGI: S.E. Kjølstad, day three).

On the other hand, the lectures in the initial phase of the project introduced the students to concepts that enabled them to understand why flow and resistance affect their actions: 'After two days at the university with tours and lectures on environmental art, flow in work, and community art, the students were more than ready to begin to work' (the researcher's memo).

Dimension 2: Belonging

This dimension has a social meaning, as it describes how design and nature sloyd depend on supporters and is closely related to the concept of wellbeing. The supervisors became important links between the owners of the snow hotel, the craftspeople, and the students. One of the supervisors said the following:

To work with art in nature is something more. It is not only to be together, but the issue is also what art must give. Art is one way to be more playful, and art is also, I think, one way to express yourself. To me, art is a way to think and understand the world around me. [While] doing something, I get time to think. (The researcher's memo).

Another supervisor said the following: I think it is important to work in [a] collaborated [*sic*] process in this environment. That gives very much to the project. Here in the snow hotel, we see the result (The researcher's memo).

In fact, belonging is linked not only to people but also to something greater than people. For instance, a cultural heritage is bestowed on tourists who come to see what is being made. (Kirketerp, 2020). In this way, social relationships were maintained both at a close individual level in the group and in a common mission: 'I think the subject has great opportunities to build relationships, but we don't have enough focus on that.' (FGI: S.E. Kjølstad, three months later).

Dimension 3: Observer's Feedback

The students first received feedback from supervisors, other students, then from craftsmen on the spot, and finally from the tourists who arrived. The feedback from the hotel owners had the greatest impact on the students' motivation. The following quote expresses the value that the students felt from being seen by others: 'I felt it was a bit fun when tourists arrived, and we somehow became part of the attraction. They took photos of us and observed us while we were working. We became part of the artwork in a sense. At first, I thought that it must have been a bit boring to arrive when the place looked like a construction site; but then, I thought that it must be interesting for them to see the work process' (FGI: T.L, Bang, day five).

Feedback can be important even if there are not many and important words:

> The mother of the two men who run the hotel dropped by and said, "Very nice, very nice, and very nice!". It was quite pleasant to hear that they were satisfied with the work we did (FGI: S.E. Kjølstad, day eight).

Who says what, according to the research group, is important for how the feedback works: 'The owners of the snow hotel responded very enthusiastically to our work' (FGI: M.H. Olsen, three months later).

Repeated feedback from qualified persons will stimulate the progress of the work as expressed here:

> The frequency of the visits [from the craftsmen and the owner of the hotel] increased as the work went along and as we approached the completion of the project (FGI: S.E. Kjølstad, three months later).

Summary of Findings

The summary of the results is based on three categories: capacity to create, mediation tools, and motivation.

Category of Capacity to Create

Students experienced the weather variables and how the natural space changed character. This bodily experience concretised weather variables as an aesthetic factor.

Several people were needed to move the materials inside on a sled. Together, it was easy to share the joy of mastering the various operations, from cutting and collecting the materials to adding them in the imagined shape.

The assigned task of turning the bridal suite into a suitable accommodation for the newlyweds was not allowed to overshadow the joy of exploring and experimenting with the design possibilities.

The main finding from the analysis of this category is that the intrinsic value in the creation process is as important as the realisation of the assignment and basic skills lay the foundation for being able to tell

a story. With this as a starting point, the conditions are suitable for creation and the opportunity to develop creativity through exploratory activities.

Category of Mediating Tools

One thing was the work with sketches; another was to make a bed to sleep in with headboards and sides of solid blocks of ice, which were also to be cut with inspiration from the ornamentation of folk art.

This category emphasised both tangible and intangible tools. The students quickly developed a personal relationship with 'the magic tool'. The feeling of being able to shape the ice based on the ideas was a new experience that created the joy of creation. The students became aware of the knowledge of tools and the skills developed by using them. The scope for conveying a narrative was within reach.

However, knowledge of a natural arena that could offer both landscape qualities and material qualities is just as important in the category of mediation tools. Qualities that facilitate joy and a place that is appropriate for a creation's placement.

Category of Motivation

Initially, meeting the large snow cave required the group to work together on the assignment and find solutions adapted to the group's prerequisites, as motivation, to successfully reach the deadline that had been set. The realisation of the group's ideas for design required cooperation to maintain the joy of work and the belief in success. The new arena required the adaptation of the sketch based on the nature of the assignment and the cave.

Feedback from supervisors at the right time meant that the work did not stop. Eventually, encouraging comments from tourists, course participants, and craftsmen who worked elsewhere in the hotel became decisive for the effort and the day's workload. However, it was the feedback from the site's owners that gained the most importance for the students' self-awareness as designers. It is valuable to receive feedback from competent people outside of a school environment.

The group that worked in the cave wanted to show that they were good at competing with other students of art and crafts from different educational institutions in the Nordic country. This internal competition may also have contributed to the group being motivated to put forth their best.

The main finding regarding the category 'motivation' is that it is not always easy to identify what drives or hinders progress in a process. Therefore, interactions between various factors previously mentioned are working together, problem solving, deadline, realisation of the group idea, feedback (from supervisors, owners, tourists, craftsmen), self-awareness as designers and competition.

The focus interview three months after returning home drew lessons. It is in the aftermath of the nature sloyd process that attitudes and general competence are evoked and developed.

Discussion

The chapter is divided into three categories: ‘Capasity to create’, ‘Mediation tools and ‘Motivation’. Each section aims this thesis research questions. Lastly presented, an overall conclusion with suggestions for further research.

Capacity to Create

The main findings were that the intrinsic value in the creation process was as important as the realisation of the assignment. Additionally, that basic skills laid the foundation for the ability to tell a story (Figure 1). The conditions of working in the snow hotel were right to stimulate the joy of creation and the opportunity to develop creativity through exploratory activities.

This statement, which is derived from the survey, underlines the importance of adopting the subject didactic consideration for teaching, which facilitates material testing, experimentation, and a playful attitude towards the natural world. It also tells us that the organisation of the teaching period is crucial for the students’ enjoyment of being in the process and for the possibility of making qualitatively good products. The didactic consequence that can be discussed is whether teachers and students must take an exploratory approach to nature sloyd, while the task may be to create something beautiful for the public's senses or useful needs.

Mediation Tools

The main finding was that the students developed skills on how to use relevant tools simply by using them. During the process, the students were trained on how to use a chainsaw and other cutting power tools, and how to use heat to melt blocks of ice and induce transparency in the ice. Further, they gained experience in using cutting-edge hand tools. There were issues related to design color of the cave to give the right atmosphere. Learning the correct working positions and following health, environmental, and safety measures are equally important.

The experience of designing the interior of a room, with custom tools, was of the greatest importance. In the same way, knowledge about the importance of the learning arena and the Nordic cultural heritage became a question the students had to deal with.

However, working with snow and ice indicates the advantage of learning in collaboration with others.

Motivation

The main finding of the analysis from the category of motivation was that the research area became a suitable and enjoyable place for teaching and learning. Construction the snow cave evokes an intimate feeling with coworkers. Thise sociocultural factors influenced the group’s design of the cave. The students opened their eyes to place-based learning through this survey. Therefore, the conversation held three months after the students returned home yielded lessons.

The students had to acknowledge that the feedback motivated them to put in effort and to think about what knowledge they wanted to take with them from this course into their future professional life as a teacher.

The students also had the experience of sleeping one night in the bed they had built under the dome of the caves, trusting that the heavy blocks of ice that create the illusion of the Northern Lights would not fall on them during their sleep. This produced a complex emotional reaction both of silence and protection, but also of fear of the unknown.

Conclusion

This part gives an overall conclusion to this thesis research question based on the categories discussed above. What educational experiences and insights do the students gain through the project and which skills do the students develop through the project?

The educational values that can be read from this survey were that working with large constructions in ice and snow required cooperation. The design process was then experienced as achievable and gave flow to the work and greater joy during the process. Exploration of materials, tools and cultural expressions was a prerequisite for the assignment to be carried out. Furthermore, feedback from others was of importance. Especially feedback from people with the most expertise in the field – as the owner of the snow hotel. Concepts such as self-regulation, collaboration in the design process, didactic talks during and after the case and place-based learning were educational values the students experienced. But also, an understanding of experimental exploration of materials and tools was important for the assignment to be carried out. The supervisor's choice of inputs was crucial for the students' enjoyment of being in the process and for the possibility of making qualitatively good products. The element of surprise, and the design challenge gave motivation to start and finish the work, despite demanded hard work over many days.

Further Research

Further research can direct attention to workshop pedagogy which is suitable both for working outdoor in the nature and at the school's workshops. In primary education, there are different pupils with different prerequisites. Some cannot sit still, or they can not relate to other pupils in small rooms. A research program that deals with school classes at different level, where the class can be divided into separate groups working with Nordic cultural heritage, based on different functioning abilities, and where the learning ideology is self-regulation can provide help for new didactics.

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