

Aesthetic Practice as Part of Work with Sustainability, Participation and Learning Environments – Examples from a Finnish and Swedish Preschool

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ABSTRACT

The aim of the article is to highlight and discuss the relationship between core activities in early childhood and primary education, with a special focus on aesthetic practice in relation to sustainability, participation, project work and learning environments. The two preschools presented, one in Finland and one in Sweden, work with ecology and sustainable education in their daily practice. The result of the study comprises a presentation of and reflections on photographs as visual representations of educational activities, learning environment settings, as well as daily educational work.

Keywords: *aesthetic education, early childhood education, participation, sustainability*

Some thoughts on sustainable education – Nordic perspectives

Today there is an emphasis on sustainability in the curricula of all the Nordic countries, which contributes to developmental work laid out in the UN Sustainable Development Goals (SDG) objectives. This area of knowledge was previously lacking in the

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curriculum, but is recognized today as an important part of education (Eriksen, 2013, pp. 91–102). Pramling Samuelsson and Park (2017) encourage early childhood practitioners, as well as researchers, to implement curricula and pedagogies that support sustainable learning (pp. 273–285). The *Education 2030 Agenda* has put light on, not only challenges concerning sustainability, but also questions of equity in education (Goal 4) (United Nations, 2015b). The *2030 Agenda for Sustainable Development and Education* claim that sustainability, equity and global citizenship need to be monitored at different educational levels (Goal 16). Wals, Brody, Dillon and Stevenson emphasize a focus on global awareness in education, where new sustainable educational perspectives and practices differ from the traditionally school-oriented forms of knowledge formation, and where new technology presents new opportunities for creating insight into what is happening in the world (2014, p. 584). Hindrances to equity in education include access to and organization of education, as well as questions related to class, gender and ethnicity (Tallberg Broman, 2014). The Millennium Development Goals (MDGs) focus on ensuring access to, participation in and completion of formal primary education and on gender equity in primary, secondary and tertiary education (United Nations, 2015a, p. 4). The *Education 2030 Agenda* states: “The SDG agenda calls for an explicit focus on equity, including equity-specific goals (Goal 5 on gender equity and Goal 10 on reductions in inequalities)”. International studies show that children’s learning, development and health in the early years are best provided in environments where care and education is combined, where activities are child-initiated and characterized by investments in exploratory education, language development and play, leading in turn to sustainable effects such as greater social responsibility later in life (Persson, 2014, pp. 97, 101, 103).

Sustainability and Early Childhood Education

In a report on research projects on sustainability by the OMEP (the World Organisation for Early Childhood Education), Engdahl states that “young children have significant knowledge about the Earth and important ideas about environmental issues, as well as knowledge of the responsibilities which individuals carry with respect to sustainability” (2015, p. 1). According to Reunamo and Suomela, children should have access to sustainable, meaningful and hands-on learning environments that encourage participation and social education, since “[e]xploration, safe adventures, multidimensional ways of moving and playing are possible when the environments have a variety of affordances and children can use these affordances” (2013, p. 92). Access to spaces in society can be seen as a right for children and as a part of a child’s sociocultural and socio-political context. Engdahl states that sustainable education encompasses participation linked to empowerment and agency for active citizenship for children as part of the protection of human rights and societal change (2015). Considering preschools as arenas for social participation becomes important and urgent in an increasingly diversified society. Access to aesthetic/artistic and cultural experiences affects what agency children and pupils receive in relation to their community and society, and are part of what preschool and school

should offer (Palmer, 1998). Aesthetic practice is, and sustainable education has become, an important part of preschool pedagogy and is emphasized today as one of the over-arching goals in the curricula for preschools and compulsory schools in Finland as well as in Sweden (Bendroth Karlsson & Karlsson Häikiö, 2014; Karlsson Häikiö, 2017b). Working with children on matters of sustainability, ecology, equity and agency indirectly includes work on social and sustainable development from a future-perspective.

Aims of the study

The over-arching aim of this study is to contribute to research that defines a broader perspective on sustainable early childhood education by describing aesthetic activities and child-initiated, exploratory and participative work processes in preschool and primary school educational settings. The intention of the study is to provide examples of how ecological and sustainable education can be combined to create a broader learning context through the use of aesthetic as well as multimodal tools, and the setting of learning environments. The study consists of two case studies of preschool and primary school practice in Finland and Sweden, and provides examples of how sustainable education is operationalized in daily practice in a Nordic context.

Method

The material of the study was gathered between the years 2011–2018. The scientific approach for the study is ethnographic, since the material was collected in both structured and unstructured ways (Gobo, 2008). The authors of the study contribute with different research material that encompasses 1) interviews with educators, and observations at a preschool/primary school in Finland, and 2) observations at the preschool made by authors 1 and 3, where author 3 is the principal of the institution. Author 2 gathered further material through 3) an interview with the principal and the employee responsible for pedagogical development at a preschool in Sweden. The Swedish material also encompasses 4) notes made by author 1 during a public presentation about the ecological profile of the preschool by the principal and educators. The authors produced the visual material, the photographs presented in the article, on study visits to the preschool/primary school in Finland in 2011 and 2018, and in Sweden in 2015 and 2018. Analysis of the material is the result of discussions between the authors, as well as analysis of the photographs of the learning environments at the schools. The material has been proofread and accepted for publication with the consent of representatives from each educational institution, in this way following research ethics established by the Swedish Research Ethics Committee (*Good Research Practice*, 2011).

Cultural heritage, inclusion and participation in Finnish ECE

Studies on child participation are common in Finland today. There has been an increase in research on child participation through decision-making that exemplifies

more inclusive and participatory educational practices (Kumpulainen, Lipponen, Hilppö & Mikkola, 2013, pp. 211–229). An inclusive and participatory paradigm takes into consideration both the cultural context and the subjectivity of quality, and challenges an educational paradigm based on perceptions on individual performance as the sole perspective in learning (Hujala, Fonsén, & Elo, 2012, p. 165). In Finnish early education, creative play and physical activity have traditionally occupied most of children's time (Pulkkinen, 2012, p. 326). This is in line with a view of the child, culture, and society based on educational objectives of “physical, social, emotional, aesthetic, intellectual, ethical, and religious education, taking into consideration for each domain the care and educational environment, the quality of care and education, and the child's own play activity” (Pulkkinen, 2012, p. 328). With the introduction of the *Finnish Early Childhood Education Act* (2018) and the *Early Childhood Education Plan* (*Varhaiskasvatuksen perussuunnitelma 2016*, VASU, 2018), a model of child-centered pedagogy is evident today, both in early childhood and in elementary education (VASU, 2018). The child has been brought to the center of his/her own learning as an active agent and participant, whose interests are utilized as part of the planning and implementation of pedagogical activities (Hilppö, Kumpulainen & Rainio, 2016, pp. 157–171). Learning is considered to take place in a participatory framework, not in individual minds, which has opened for more collective views on learning (Karila, 1997, p. 211).

Cultural diversity and sustainability can be identified in the Finnish early childhood education curriculum as aspects that are to be implemented through multifaceted pedagogical activities (Karlsson Häikiö, 2019).

In the education of children, the Finnish cultural heritage, national languages and the cultural, linguistic and visual diversity of the community and the environment are valued and exploited. Educators are required to have a knowledge about other cultures and different views, as well as an ability to see and understand things from many perspectives and to settle in another persons' position. (VASU, 2016, p. 63)

Cultural institutions play an important part in Finnish early childhood education. Since the 2000s, research on children's access to public spaces, as well as cultural experiences, has occupied a strong position in Finnish art education practice. The role of education is to enforce children's knowledge of cultural heritage, and encounters with art works as well as architecture or artefact design enrich the daily life of children (Rusanen, 2007; Rintakorpi, 2018).

Systematic evaluation of pedagogical activities is acknowledged by the Board of Education to be a central factor in developing quality in early childhood education. “Scaling the pedagogical activities along children's personal and group level needs and age-related requirements is an integral part of ECEC pedagogy, a process which is highly dependent on the competence of the ECEC staff” (Salminen, 2017, p. 136). Bottom-up perspectives rather than top-down models often characterize research on early childhood education in Finland. An example of this is research on sustainability,

where there is a lack of studies and knowledge in the area (Wolff, Sjöblom, Hofman-Bergholm & Palmberg, 2017, pp. 1–23). During the years 2009–2014, the OMEP (World Organization for Early Childhood Education) conducted a research project focusing on raising awareness about sustainable development for small children. Research in this area is evolving, and often includes examples of participatory methods (Engdahl, 2015; Wolff et al., 2017, pp. 1–17). The Finnish national development plan for education states that sustainability is to be included in all education and research, as well as teacher education in Finland (*Utbildning och Forskning 2003–2008*, 2004). In work with child participation where educators collaborate with children concerning sustainability, it is important to emphasize the educator as a role-model, the educator's own pre-understanding of the subject, as well as issues concerning ethics and the selection of content and methods, since all of these factors influence outcomes (Borg, Winberg & Vinterek, 2017, pp. 151–172). Culturally sustainable development is emphasized in the prevalent early childhood curriculum (VASU, 2016, p. 63).

Finnish Case Study: Sustainability from an ecological and educational perspective

In a combined preschool and primary school (up to year 2) in northern Finland that has a cultural profile, sustainability from an ecological and sustainable education perspective is at the forefront of work with education, the learning environment and nutrition and health. The preschool has been Green Flag certified for the past 20 years, requiring a yearly report on work-methods and pedagogical orientation at a Green Flag summit in order to use the certification label. Certification includes nine sustainability keys regarding: litter, waste, re-use, re-cycling, consumption, energy and climate, transportation, public rights, as well as health and safety (<https://www.dalsland.se/media/1401/groen-flagg-och-giftfri-foerskola.pdf>). Green Flag certification concerns more than ecological sustainability, and also includes sustainable education concerning content, educational philosophy, children's rights and so on. At the preschool, outdoor play, nutrition and health comprise an important part of the programme, and are typical of the Nordic approach to early education. The kitchen and preparation of food play an important role. Children participate actively in the kitchen with the cook, doing different activities such as preparing the menu, ordering food and recycling left-overs. Movement indoors as well as outdoor play, and for instance yoga, is used to work with the children's body expression, physical fitness and relaxation. Outdoor activities are tied to project work. In addition to the preschool playground, surrounding public spaces such as streets, the city center and market place, museums, sports facilities, and the sea bay are all seen as part of the learning environment. Children's initiatives, ponderings, explorations and reflections on the environment are all part of the educational experience.

The case study describes how the education program, cultural profile and learning environment are closely linked to sustainability and ecology. Work with environmental questions is common and approached at different levels of complexity. Special

days are set aside to put light on questions of ecology, re-cycling and sustainability. Drawing, painting and using mixed media are commonly used as tools to elaborate and explore different topics and knowledge foci. These activities take place in the attic of the preschool/school, where a space has been created for more hands-on activities with a variety of multimodal tools at disposal. These kinds of activities are often used during a pre-project phase where specific topics are identified for longer, in-depth project work encompassing collaborative exploration, an approach inspired by Reggio Emilia's pedagogical philosophy (Vecchi, 2001). Project work starts in smaller groups, and the whole group or class is later engaged, for instance, through group narratives, presentations, as critical friends and so on. In this way, the individual child as well as the group is used as a tool for collaboration. In child-centered pedagogy in Finland, the significance of group size is emphasized, especially in the early phases of group formation. The educator/ teacher should have plenty of time to discuss and talk openly with the children. If the size of the group is too large, there will always be children who are less likely to partake in conversations, which in turn makes the educational situation more superficial. This kind of procedure hinders collaboration, equality and a sense of identity. Child-centered dialogue is an important part of building up an educational setting and culture, which is also highlighted in the Reggio approach (Rinaldi, 2005). The psychological learning environment that maintains a conversational and dialogic culture supports children's agency and encourages acceptance of each child giving voice. The importance of giving support to each individual voice in the group as well as the group culture is emphasized in the curriculum, since it is through this that the child's own knowledge and ideas are brought to empower the group (VASU, 2016). Such an approach supports a child view where no comments or answers are wrong and rather that all ideas are valued as part of the learning community. In this way, understanding of variety is expanded and multifaceted learning environments where the children learn to accept and affirm each other positively is created, even when there are differences of opinion. In this way, children learn to accept diversity and partake in democratic processes where tolerance, understanding of others' opinions and collaboration is a vital part.

Global Water Day – Oceans project

The theme of Earth Year 2018 was the plastic pollution waste problem. At the preschool/school the teachers notified the children that there was a Global Water Day coming up. The children showed interest in the oceans of the planet since the preschool/school is situated close to a sea bay that is a familiar environment for the children. In one group of 6 year-olds in pre-primary class and pupils in year 1–2, this topic grew to be a project about the ocean, pollution and ecological sustainability. A way to explore this topic was initiated by the children/pupils. They suggested that they could look at films of oceans on the internet where marine life under water is depicted. The teachers challenged the pupils/children by combining the film material with hide-and-seek play with things from the ocean. The children were supposed to feel the hidden objects

with their hands with their eyes closed, and guess what they were. After the different objects had been identified through tactile detection, they were placed in front of the pupils/children. Together they pondered what could be found on the bottom of the sea. Some of the objects belonged in the sea, but there were also objects that did not belong there. How had the objects found their way there? Why were these objects in the sea? This was the start of a project where the children became interested in the problem of plastic waste in the oceans. They divided into small groups and carried out different kinds of investigations for a longer period, and found information on plastic waste in the oceans that formed big islands of waste. This was something that intrigued the children a lot. They sought information on questions like: What characterizes a sea and an ocean? What kinds of problems are linked to pollution in the oceans? In what ways can oceans be polluted? The children studied different kinds of ocean current maps, followed information on the internet about the routes of the currents, and examined images of plastic waste (Image 1–2).



Images 1–2: The children are gathered here around lost-and-found objects from the bottom of the sea that the teachers had collected; the children also looked at maps to find the ocean streams and the ways that the plastic accumulated in plastic waste islands.

The teachers asked the children the following question: In what way could the plastic waste be re-used? The children gathered plastic waste from their homes and the material was utilized in different ways. For instance, an art installation was constructed so the plastic waste could be re-used for a good purpose. They also decided to write a song called “Keeping the Oceans Clean” to make other people more aware of the plastic waste problem as a way to minimize marine pollution and improve the ocean environment. This project was presented at the annual Green Flag summit along with other projects from the school.

Sustainable early childhood education in Sweden

Part of providing quality education is ensuring that children are able to participate and give voice, according to Norling, Sandberg and Almqvist (2015, pp. 619–634). Project-oriented and functional learning contributes to enriching and motivating children in early childhood as well as primary education. Children and their parents are prepared for social participation regardless of background through an inclusive educational agenda that focuses on integrated perspectives on learning environments, participation and citizenship, with the school as an arena (Karlsson Häikiö, 2018c, pp. 1–14; Lunneblad, 2013). Pramling, Samuelsson and Park (2017) define Sweden as a leading nation in relation to sustainability policies. It is also a country where equity is high. Sweden emphasizes the importance of access to education and sustainability as part of lifelong learning, Goal 4 of the SDG objectives, as being one of the main means of creating a more inclusive and equitable society. Other factors emphasized are staff competencies and parent cooperation (2017, pp. 273–274).

The impact of Reggio Emilia's pedagogical philosophy on Swedish ECE

The interest in Reggio Emilia-inspired educational work in Sweden can be explained by the radically new and inspiring methods developed in certain Italian preschools. The philosophy stems from the common historical tradition of European early childhood education, which is progressive, dialectical and activity-oriented. The social political views in the Emilia Romagna region correspond with Swedish social democratic aspirations for its educational system (Wehner-Godée, 2011, p. 286). According to the OECD, the interest in Reggio Emilia-inspired education, is stronger in Sweden than in other OECD countries (Lindroth, 2018). According to Hoyelos Planillo, the impact of the Reggio Emilia philosophy on Swedish early childhood education has in turn influenced the Reggio approach internationally (2004, pp. 144, 185). The Reggio Emilia approach has been criticized for using aesthetics in a superficial way, documentation as surveillance, creating a cargo cult for the educational elite (Johnson, 1999, pp. 248–261). Wright, to the contrary, points to the self-critical and de-constructing nature of the Reggio Emilia approach as vital, and suggests that the approach may instead be defined as a innately self-critical, a "network of interdependent relationships" (Wright, 2000, p. 225).

Inspiration from Reggio Emilia in Sweden has evolved over time, and informs the design of outdoor and indoor spaces in Swedish preschools today (Nordin-Hultman, 2004). Project thinking has emerged as a tool to highlight meaningful learning, where observation and documentation is used to visualize ongoing learning processes. A focus on collective learning and reflection is crucial, because individuals live in relation to others in the lifelong learning process. This process includes affirmation of subjectivity, equality, solidarity, reciprocity and participation in an exploration of values as well as the surrounding world. The explorative method used in Reggio Emilia preschools is intended to develop children's abilities through seamless integration between artistic activities, creative play, construction play, etc. In work with

sustainable education, art, culture and visual skills are important educational strategies. A focus on the studio – or atelier – has become a symbol for the development of social participation and analysis of society by visual means. By learning to reflect on what the child sees, or growing an ability to analyse by developing ways of seeing, the child's competence grows by exercising the ability to express, reflect and communicate thoughts and opinions (Häikiö, 2007; Vecchi, 2001, 2014). This in turn helps the child to understand the relation between concrete and abstract levels in making meaning of phenomena in the world.

Spaces, activity zones and aesthetic aspects of learning

In the Reggio Emilia preschools, the learning environment is consciously organized into activity zones (Häikiö, 2007). Documentation plays an important part in this environment as an informative, aesthetic and visual factor in the construction of the spaces (Essén, Björklund, & Olsborn Björbo, 2016). In a setting of multisensorial and emotive spaces, light, sound and other factors (transparency, osmosis, olfactory and tactile material) are taken into account when arranging the spaces (Häikiö, 2007). The spaces are described as symbols for a philosophy that mirrors the emotional, relational and communicative aspects of the approach. In this environment, mirrors of different modes are used, for instance characteristic mirror triangles, and other perceptive and optical materials are an integral part of the work with the children's perceptive education, which in turn affects their identity and body-conception (Karlsson Häikiö, 2018b). Malaguzzi pointed out the importance of knowledge of materials for the child's results, which in turn is related to the child's image of him-/herself as competent (1993b). Through observing phenomena and using different kinds of materials, a repertoire of experiences is generated, offering a framework for what can be created. The creative process reinforces and deepens learning in thought as well as emotionally through the processing of various materials and techniques, according to Vecchi (2014). Learning takes place through play, exploration, creation, exchanges between children, and co-construction with the educators (Dahlberg, Moss & Pence, 2003). It is through work with perception, optical phenomena, light and projections, mirrors, colour, shape and using a variety of materials and techniques that a child's ability grow. In this way, the children learn the qualities or "alphabet" of materials (Vecchi, 2001). The metaphor of a hundred languages has also come to characterise the Reggio Emilia approach. This metaphor for multiple modes of expression and communicative languages, is not only linked to skills and abilities, but also to the development of different communicative and relational strategies (Malaguzzi, 1993b). A child's hundred languages can be interpreted as knowledge of materials, but it is also a metaphor for multicultural perspectives on learning and relationships that promote an understanding of others (Karlsson Häikiö, 2018a). The children explore and invent new forms of expression, formulate hypotheses, ask questions and find solutions to themes raised during discussions in morning assemblies and through the project work.

Swedish Case Study: Ecology, participation and diversity

Situated in western Sweden, in a semirural municipality, is a preschool with an ecological profile. Its sustainable education profile is based on four central principles that permeate all activities at the preschool: 1) sustainability in the organization of activities where each child, educator and parent forms a whole, 2) sustainability in relationships with children and families, 3) sustainability in self-esteem through an expanded language concept, and 4) sustainability by establishing healthy eating habits at an early age (Interview with principal, 2017). The new preschool building built five years ago is in itself entirely designed and constructed with environment-friendly materials with an aim to be a toxic-free institution, to use natural and ecological food, ideas, materials, and to re-use as much as possible of the residual material produced in food preparation, construction activities, aesthetic activities and so on.

Relationships and diversity

Relational pedagogy is part of the creating sustainable education, since a preschool is something that is shaped together. The educational activities are intrinsically formed by the core values used as guiding principles at the preschool: relationships and diversity, communication and trust, participation and meaning-making as well as project work and exploration. These key values stem from the theoretical foundation of the preschool, and manifest in daily practice, child and parent participation, the organisation of interactive learning environments and in educational planning and activities. In the global sustainability goals, work with child-oriented practices is emphasised (Engdahl, 2015). The preschool is inspired by the Reggio Emilia approach, with theories of relational pedagogy and space as a third educator (Malaguzzi, 1993a; Karlsson Häikiö, 2018a, 2018b; Nordin-Hultman, 2004). Educators participate as contributors to learning, as opposed to constructivist perspectives where the teacher is considered the prime source of knowledge (Dysthe, 1996). The preschool educators are seen as co-constructors in a collaborative approach, where children and teachers create knowledge together (Palmer, 2011). Aspelin and Persson claim the relationship between educators and children to be the basis of education (2011). An educator who enables the children to be part of a learning process together with others has the opportunity to see how the needs of children compose the conditions for learning. In this relationship, an interpersonal power field arises that Aspelin and Persson call the focal point of education, based on the interaction between educator and child. According to the educators at the preschool, their task is to see the needs of the children, help them to understand their potential, and also be aware of and set limits. This is done by supporting and confirming the children's feelings, and being curious about the interests of each child. By creating a relationship with each individual and using everybody's differences to create a space, a context arises where everyone is important to the group.

A dialogue-based approach is one of the keys to creating relationships. By acknowledging family needs and experiences, trust-based cooperation is built with parents, promoting a climate where everyone feels involved, which is an integral part of the

preschool's philosophy. In order to meet the needs of all the different families in the best way, the educators create different kinds of meeting places, including: daily interactions, parent meetings, workshops, and using documentation tools to enable parents to experience participation in both their children's learning and the preschool activities. In other preschools, everybody is supposed to have the same opportunities regardless of gender, age, size, origin and language. At this preschool, educators focus on the abilities of the individual child, building on them to make everyone feel important to the group and using everyone's differences to create a space and context where everyone can participate. This value-base permeates the preschool's daily work, where diversity is considered to be about more than origin, where we come from, but instead about seeing differences as a part contributing to building a whole: "Everyone we meet has something new to add. In meeting with other people, we always expose ourselves to the risk and ability to change ourselves and the one we encounter" (Wehner-Godée, 2011, authors' own translation).

Questions about educational models can be further explored based on other approaches to learning, as well as on children's cultural participation with the aim of developing active citizenship, and from the perspective of preschool as an inclusive educational environment and social arena (Dahlberg, Moss & Pence, 2003). Therefore, in the multicultural environment of today's preschools and schools, it becomes crucial to be able to reflect on similarities and differences. A revision of a normative view of preschool and school is necessary. Through an inclusive educational entry-point, children and parents are prepared for social participation regardless of background, with a focus on an integrated perspective on learning environments with preschool as an arena.

Communication and trust

A dialogue-based preschool is assumed to help children grow, develop and take responsibility. Responsibility is created through building confidence in one's capabilities and trust in each other. This is done by creating linkages between the safe and the new in project work, by advocating curiosity, and creating courage to try new things and share experiences. The educators help the children to express what feels difficult and confirm the feelings of the children. This is practiced in the morning assemblies as well as during project work. If children are given responsibility, they grow with the task and their faith grows in their own ability. This includes trusting the children's ability to solve problems and conflicts, and meet challenges. "Knowledge, of course, is nothing that one person possesses or exists as a pre-existing truth to detect, but something that is created by human beings in relation to and in dialogue with the world" (Dahlberg, Moss & Pence, 2003, p. 241, authors' own translation). In a collegial environment, appreciation of each other's different skills and respect for each other's opinions is part of creating relationships, as is daring to turn to each other for help and support. Before the new preschool was built, staff had been frustrated because of the lack of a common understanding of and disagreement over their professional work. Therefore the leaders and educators were tasked with working with relational pedagogy and the working environment. They put a lot of effort into establishing the

value-base of the preschool so work could start from a common base in the new preschool (Alnervik & Kennedy, 2010) built five years later. Through this work, the first principles of the value base of the preschool became apparent: sustainability in the organization of activities where each child, educator and parent forms a whole in relationships to other children and families.

Participation, project work and exploration

The project method used at the preschool is a process-based model encompassing experimentation and exploration, where children and educators formulate a hypothesis or question before looking for solutions. Explorative activities are based on individual and group interests. In order to allow for in-depth learning, the educators need to identify an interest that comes from within each child or from the group of children. The educators need to be present, collaborative, curious, attentive and observant, in the way they follow the children's actions, words and interests. By asking open questions, they can reflect with the children, and in this way follow and drive processes that allow the children to become active seekers. Project work at the preschool starts from exploration on the part of the children and is based on what they are interested in related to the curriculum for preschool in Sweden, *Läroplan för förskolan Lpfö98, revised 2017*. In this way, work starts with the children's own theories and thoughts and remains open to change and transformation. The task of the educators is to promote discovery, exploration and reflection on events before they meet final answers or well-established theories. In this way, fantasy, imagination and hypothesis-making and reasoning are an integral part of the learning process. In this kind of approach, the environment, interpersonal relations and use of multiple languages, are central, in addition to being where relationships takes shape (Palmer, 2011).

In order for the children to feel that they are an important part of the group and the entire preschool's activities, the role of the educator is to listen actively, show interest in how the children think, and involve the children in activities and documentation. Educators offer the children many opportunities and listen attentively to the children's thoughts and opinions. The preschool encourages parental involvement. This involvement is apparent in daily conversations about the children's development, needs and desires, and promotes transparency. Through communication with parents, a sense of security is created, which empowers them to ask questions, express opinions and feel they have the opportunity to influence the learning environment of their child. An open attitude of listening, confirming, and trying to understand each other's thoughts, experiences and feelings, is aimed at building an open climate. All of the preschool's educators are involved in and have responsibility for different aspects of the educational work. They are responsible for the content of activities, encouraging the children's curiosity, and formulating projects. Offering children the opportunity to put their thoughts into a wider context gives them opportunity not only to be seen, but also to be challenged and think one-step further from a broader perspective.

Ecology and recycling

Design and construction of the new preschool was a collaboration between the architects, principal and the educators. The previous preschool was situated in an old building that needed to be replaced. It was decided that the new preschool would be inspired by nature and have an ecological profile. The design of the new preschool building resembles bird nests and merges with the natural environment in a forested area of the municipality. During the building process, the children were also involved through visits to the construction site, work in the preschool studio or atelier and project work on the theme of construction (Karlsson Häikiö, 2018b). The educators felt a need to create a learning environment that encouraged meaningful interaction with materials. These materials, the environment and artefacts are not just insignificant objects, since materials become active agents responding to the children's actions (Nordin-Hultman, 2004; Lenz Taguchi, 2012). Materials create curiosity and thoughts about sustainability in the world. By meeting and exploring the material on the terms of the material, children inspire each other and learn together, find the character of the material, find ways of using the material and are given space to explore.

Work with creativity, multimodality, sustainability

In the new preschool, the cook and kitchen occupy a special place, both physically and psychologically. The food prepared at the preschool is organic. The children are engaged in the planning of the meals, the process of preparing the food and in recycling leftovers. Vegetables and seasonal produce used in food preparation are grown organically and produced locally, as far as possible. The cook interacts with the children during the whole food production process, promoting healthy and ecological eating habits. The products of the kitchen are also used in the preschool atelier, for instance painting with different fruit or vegetable juices, and seasonal plants are objects of study, artistically and scientifically (Image 3–4),



Images 3–4: The vegetables and fruits are always seasonal and are used in the aesthetic activities in the atelier.

The fruit and vegetables are used in different ways to understand colour, form and composition from aesthetic perspectives, and are elaborated using different artistic materials. At the same time, the children develop an understanding of nature, growing of plants, biology, and mathematics through close research on how plants look and are structured, where, how and in which circumstances they grow, and how they taste and smell differently depending on whether they are raw or prepared.

Setting of activity zones and learning environments

The activities at the preschool are inspired by nature and scientific exploration, outdoor activities and walks in the nearby forest. Inside the preschool, the educators have constructed activity zones for different purposes. For instance, light tables are used to create nature zones where the children can explore, sort and elaborate with natural material, visual material and books on nature, flowers, insects, leaves etc. Different activity zones are established as nature corners, zones of natural materials, with optical material like mirrors, settings transforming light, use of light projection, light tables. The use of sensation as receptors of information is part of the work in the atelier and several zones for aesthetic work with 2- and 3 dimensional materials have been created (Images 5–6).



Images 5–6: These photographs show optical material as mirrors and activity zones for working with light tables and natural materials for scientific exploration.

Meaning-making through mediation with different modes of expression and multi-modal visual tools is also part of the setting (Jewitt, 2011). Different light artefacts, light tables, over-head projectors and film projections are used to create a stimulating atmosphere for the different senses, inspiring the children to creative play, interaction and construction, and in this way challenging the senses and the children's visual capacity. Film projections inspire the children to see new kind of environments, and explore natural phenomena and different natural environments. One year the entire preschool worked with an over-arching project called "Sustainable

Future”, where each section chose their own project to focus on. In order for relational pedagogy to emerge, the educator needs to pay attention to the child’s learning process and the opportunities for learning that arise through the activities. The child in turn needs to accept the educator’s actions and show that they understand the meaning of the mutual relationship. “We become in relation to the world and in relation to each other. No other knowledge exists than in the one designed together” (Lenz Taguchi, 1999, authors’ own translation).

Conclusions

Sustainability and a sustainable pedagogical approach is the predominant ideological foundation of the preschools described in the case studies, encompassing work with child-initiated activities and the participation of families. In both preschools, aesthetic activities are integrated into the daily routines and learning experiences of the children. The physical settings of the learning environments are inspired by the idea of space as a third educator. The sustainability perspectives of the preschools not only encompass ecological perspectives, even though they are at the core of all activities, but also entail working with meaning that arises from multiple perspectives of thinking and acting, nurturing growth through a variety of opportunities to participate, communicate, collaborate and learn. These opportunities are seen in the different activity zones organized thematically. Sustainable education is linked to the use of aesthetic tools and multiple modalities to create possibilities for communication in a wide context. From the visual material, interviews and study visits, the authors conclude that visual representation, optical material, learning environment settings, as well as project work function as tools for meaning making and understanding the complexity of the outside world. The use of art and natural materials and exploration with different senses are used to get to know the multiple modalities of artistic expression, as well as to gain a better understanding of senses and bodily expression as a communicative form. Collaborative work in different learning settings is a way to create diversity in order to understand similarities and differences as a foundation for developing tolerance, empathy and inclusion.

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