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A Pedagogy of Emergent Ocean Literacy

– Narrative accounts of children's explorations in the coastal landscapes
of Western Norway

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Summary

The Intergovernmental Oceanographic Commission (IOC) of UNESCO (2020) states that we need to join forces and integrate social sciences and civil society as well as change humanity's relationship with the ocean. The IOC asks: What does the Ocean Decade mean for you? This study gives answers from the civil society perspective: children and educators, local communities, artists, and early childhood education researchers.

The report presents a narrative account of recent and ongoing field research in Western Norway's coastal communities. Scientifically, this study reaches beyond the division of nature, arts, society, biology, and pedagogical cultures, as it follows an integrated approach to early childhood education, arts, and the life sciences. The report, however, is written in a participatory and child-nature-centred ethnographic genre, where researchers co-create with participants and go alongside children and staff, create narrative field notes, and include photos and video documentation. The human experience is described as unfolding through time, place, and relations giving attention to the pedagogical approach and children's experiences.

Main aim and research questions

Through this study, we aim to focus on the youngest children's meaning-making and formation as well as the role of early education in the United Nations Decade of Ocean Science for Sustainable Development. This idea is linked to the 2030 Agenda realized by the United Nations in 2015 and the aim to support the implementation of Sustainable Development Goal 14. This effort seeks to build a more comprehensive understanding of civic relationships to oceans and ocean care. Of relevance for early childhood education is the aim of the UN Decade of stepping change in ocean education at all levels (Ryabinin et al., 2019). Ocean experts recommend that a comprehensive map of the ocean should include much more information than just ocean depth. Knowing and understanding that oceans are a unique source for humankind and that human behaviour is crucial for sustaining the planet's health for all life on earth (Santoro et al., 2017). Our study adds to the narrative knowledge of how children explore, experience, and express the biotopes between land and sea, actualising its ecosystems, cultural objects as well as human and material resources.

More particularly, the study aims to reconceptualize the concept of Ocean Literacy as relevant to early childhood education, intergenerational engagement, and societies at large. High-quality early childhood education is recognized by balancing teacher-led approaches with child-initiated approaches. Collaborative exploration bridges these two approaches, and the study started with a hypothesis that practices characterized by collaborative exploration (Ødegaard 2020; 2021) will be well suited for all generations and genders.

Our questions were:

- 1) What is central to children's exploration and narrative meaning-making while engaging in coastal landscapes and arts?
- 2) How can pedagogies of collaborative exploration broaden the concept of ocean literacy to be inclusive and relevant for early childhood education?
- 3) How can interdisciplinary research design, arts, geography, literacy, and life sciences enrich early childhood education and intergenerational activities and what are the lessons learnt?

Arts and research design

The artists and researchers carefully co-created the art project and the research design. Both the art project and the research project were based in a relational ontology, meaning that the identity formation of the individual was not of interest here. Instead, meaning is co-authored (Sidorkin, 2002) and humans are always situated in time and space (Bakhtin, 1981). There was, however, a division of labour and responsibility. The Arts Pilots [Kunstpilote-ne] took the main responsibility for the detailed planning and logistics of the art project, while following an approach. The researchers took the main responsibility for ethics and consent, theoretical approach as well as for the data creation. Even if the project was co-created, and all were active participants, we performed different roles during the kindergarten visits. The Arts Pilots performed and led the activities with the children while the researchers walked alongside and engaged intuitively with children, staff, and the artists. Their approach can be read in their report to the Arts Council (Marandon & Marandon, 2022)

Each kindergarten was also involved in co-creating the premises and logistics in their local landscape and kindergarten. They were responsible for the security during the

excursions. The staff in the kindergartens were encouraged to observe events of collaborative exploration in the daily life and routines in kindergartens and select stories to share with the researchers. The pilot kindergarten participated in an evaluation of the pilot in the form of a group interview. The artists and the researchers met several times to plan, make adjustments, and evaluate the project. On some of these occasions, the filmmakers participated. The filmmakers went alongside the project, intuitively trying to film children's sensorial and explorative approach as well as documenting the narrative order of the project, giving attention to place, time, and relation.

The narrative study includes researchers' narratives and descriptions and participants' (children's/teachers'/researchers'/artists') collaborative narratives (co-narratives) transcribed from video footage. With this approach, the narrative study contributes to practice-developing research. Empirically, the study narrated and gave detailed descriptions to extend the knowledge of ocean literacy by giving attention to the youngest children's sensing, narrative meaning-making (Ødegaard, 2007) and expressions from an angle where collaborative exploration (Ødegaard, 2021) of local landscapes (Ingold, 2010b) is central.

The project was participatory as the researchers and artists engaged in planned events outdoors and indoors by joining the children in their experiences of the local sea landscapes, by touching, watching, smelling, moving and listening, by watching paintings, reading picture books about marine topics, by listening to shanties, poems and local storytelling about sailing and circumnavigation, by reading maps, both local sea maps as well as world maps; narratives of emergent understandings, knowledge, and expressions. The report study describes how children make meaning in a series of related subprojects.

Main findings and take-away point

The study demonstrates how contemporary pedagogy in early childhood education and care can move forward through collaborative efforts across disciplines of education and the arts as well as by borrowing concepts from anthropology, geography, and the life sciences. Through this interdisciplinary approach, the study also demonstrates narrative cases of pedagogy for collaborative exploration relevant to kindergarten practices.

The ethnographic approach narrates events and activities with attention to sensing and exploring the biotopes in the local coastal landscapes and the imaginary planet.

1) The concept of Emergent Ocean Literacy is proposed to capture a whole-body approach

Ocean literacy was previously and primarily found in the research literature to reflect cognition and concepts learning about oceans in didactics for older children and students in oceanography and marine biology. This study proposes the concept Emergent Ocean Literacy. This concept embraces sensation, aesthetics, values, and conceptual knowledge regarding the biotopes between land and sea. This knowledge also includes a growing capability to narrate and manoeuvre coastal landscapes and is well suited for early childhood pedagogies and to the idea of a robust childhood. The report will present narrative examples describing how Emergent Ocean Literacy evolved in the project and will add to the current knowledge about Ocean Literacy Education.

Take-away point:

The concept of Emergent Ocean Literacy captures very young children's sensing, exploring, and learning about the oceans and oceanscapes.

2) The project documented recall of collective memory in children 4 years of age.

The recall was elicited from a critical event; In 2017, a Blekhnodenebbhval (*Ziphius cavirostris*) whale found in the local shores in Øy garden. Its stomach was filled with plastic bags and a large amount of microplastic. The whale was emaciated, and scientists believe that the amount of plastic had stopped the digestive process and this led to its death. The children participating in the project were not yet born in 2017, and yet this event and the seriousness of plastic waste in the oceans came up in the children's narratives. Children's collective memories of critical societal events is rarely documented in research so far. This finding of collective memory in young children is of relevance for sustainability research and public outreach in general.

Take-away points:

- a) Very young children are emotionally engaged with animal and nature welfare
- b) Very young children are capable of understanding the danger and impact of living creatures eating plastic

3) The project finds that children and staff, from a gender perspective, behave near gender-neutral while exploring nature.

This is explained by the project's pedagogical approach to provide children with access to open-ended materials like stone, leaves, and moss and for exploring water and water landscapes as well as an art-directed project. The findings are relevant for early childhood education.

Take-away point:

Giving children access to nature, loose parts and open-ended materials seem to encourage gender neutrality

4) The project finds that, even if the urge to explore seems to be innate in humans, children and adults vary in explorative behaviour.

In open-ended sequences, some children are highly explorative, while others need to have a guiding adult to engage in collaborative exploration. Collaborative exploration is found to be a skill. Roles as teachers and artists risk to be instructive to achieve goals as well as to push the project forward. The natural environment enriches children's play and exploration.

Take-away points:

- a) Collaborative exploration can and should be trained in teacher education and in further education for all staff.
- b) Some children might benefit from invitations to collaborative exploration and projects that blend teacher-initiated and open-ended, children-initiated activities in dialogic responsiveness.
- c) Knowledge about play and exploration as well as local aesthetics and cultures must be validated and secured in the processes of building and upgrading kindergarten environments in order to avoid the plasticification of children's environments.

5) The project initiated and facilitated generational meetings between older adults and younger children.

The study documents that intergenerational relations led to collaborative exploration and new experiences for the young children, staff, and older adults. Cultural transmission of local boat culture occurred through visits to the boathouse with old boats and through storytelling and guidance from elders. In addition, sensing and experiencing fishing from small boats triggered knowledge about cultural artifacts and boat culture. The fishing experience led to sensing and naming fishes that were harvested.

Take-away points

- a) Intergenerational collaborative narratives enrich early childhood education and ocean literacies, especially related to the cultural aspects of transmitting local culture from the older generation to the very young and vice versa.
- b) Children's curiosity and engagement about the biotope and the artefacts created meaningful generational meetings for the older adults.

Vignette

In August 2021, the tall ship Statsraad Lehmkuhl, "the pride of Bergen city", and one of the world's largest sailing ships in full operation, set sail from Bergen, Norway and began The One Ocean Expedition, a twenty month long circumnavigation of the globe. This expedition aimed to share knowledge and raise awareness about the importance of the ocean for our common, sustainable future. It was affiliated with the UN Ocean Decade. Climate researchers, students, and leaders were on board.

At the same time, another affiliated project was planned to set off in the coastal and marine regions of the City of Bergen and the Island Øygarden, facing the North Sea: The One Ocean- Exploration. More than 70 very young children were involved; 60 four-year-olds and 10 1-3-year-olds were invited to participate in a poetic, imaginary journey. The world map and a local sea map became poetic symbols of the large oceans that keep us apart as well as binds us together, and the local seascapes became places of sensation, aesthetic impressions, enquiry, wonder, memories, storytelling, discovery, imagination, and for emergent ocean literacy to unfold.

The arts project was located at different coastal landscapes within walking distance of the kindergartens where the children were enrolled. Four different kindergartens in the region were selected for the project and the staff were invited to the project with opportunities to tailor it to their plans and safety regulations. The staff were invited to a talk about the project aims and how to best facilitate for the project, from their perspective. The researchers were early childhood educational researchers from the KINDknow centre and on board this imaginary ship expedition were artists, filmmakers, and a local community of older adults. While the climate researchers studied the world's deep oceans, and the conditions on the oceans, our pedagogical project were set up to invite children to explore and experience the biotope between the sea and land, imagine the life in the deep sea, co-create stories of the sea, and trigger a marine interest in order to elicit emergent ocean literacy.

Statsraad Lehmkuhl by the Askøy bridge. Photo captured by Jean Canino Guadana



Chapter 1 - Introduction

Through this study, we aim to focus on the youngest children's meaning-making and formation as well as the role of quality early education¹ in the United Nations Decade of Ocean Science for Sustainable Development. The idea of an ocean decade was linked to the 2030 Agenda realized by the United Nations in 2015 and the support of implementing Sustainable Development Goal 14.² In addition to the UN Decade's aim of providing more ocean information in the scientific, governmental, private and public sectors, it was also set up to bring about change in ocean education at all levels (Ryabinin et al., 2019). Topics such as climate education, environmental education, marine education, and ocean education are more often associated with the education of young people; early education will fill a gap in the research of Ocean literacy and education. The interconnections between education, coastal landscapes, intergenerational engagement, and art are unexplored. Ocean experts also recommend that a comprehensive map of the ocean should include much more information than just ocean depth. Knowing and understanding that oceans are a unique source for humankind but also that human behaviour is crucial for sustaining the health of the planet for all life on earth (Santoro et al., 2017).

Sustainable development in the realm of Early Childhood Education & Care (ECEC) in coastal landscapes and communities calls for a recognition of biotopes as well as cultural ecosystems. The cultural and formative aspects, how humans view and value the oceans are developed across generations (Accott & Urquhart, 2014) and must be considered crucial in the formative mission of quality education. Our study adds to the narrative knowledge of how children co-explore, experience, and express the biotopes between land and sea. The study actualizes ecosystems, cultural objects, and how children engage

in collaborative exploration with human and non-human resources. Moreover, it adds to the knowledge of engagement across ages, generations, sectors, and disciplines. More particularly, the study aims to add to the knowledge of the concept of Ocean Literacy, so it could be more relevant to early childhood education and intergenerational engagement. This will be done by analysing the literature on literacy and drawing on our ethnographic fieldnotes. High-quality early childhood education is recognized by balancing teacher-led approaches with child-initiated approaches. Collaborative exploration bridges these two approaches, and the study started out with a hypothesis that collaborative exploration will be well suited for all generations and genders. Children's exploration is seen as a dialogical engagement with the characteristics of explorative practices and how these interact with the central conditions of dynamic relations, activities, time, and space (Ødeggaard, 2020). Exploration practices can be verbal as well as silent practices, driven by body, performance, and doing. The concept of collaborative exploration describes a pedagogical approach which involves a dynamic process and will give positive connotations to the pedagogical practices.

Current globalization efforts create problems, such as rapid urbanization, environmental degradation, climate change, and biodiversity loss. Children are exposed to high risks because they live longer and are more likely to experience the effects of climate change than others. This calls for early childhood education and care (ECEC) stakeholders to make a paradigm shift towards more sustainable ecological worldviews and frameworks that will allow children to co-create and shape alternative futures. Water as a global resource has been appreciated and praised for its beauty, for providing natural experiences, and for its wildlife, health, domestic, agricultural,

¹ As proposed in Sustainability Goal number 4. Sustainable Development Goal 4 is about quality education. The full title of SDG 4 is the mission statement: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Target 4. 2.: By 2030, ensure that all girls and boys have access to quality early childhood development, care, and pre-primary education so that they are ready for primary education (UN Agenda 2030 and Sustainable Development Goals). In addition to this, we follow the Norwegian Framework Plan for Kindergartens Task and Content (2017) that states that quality education in early childhood safeguard a good childhood as well as a good education and see sustainable development as a core value for the formative development of the child.

² Sustainable Development Goal 14: Life below water is about conserving and sustainably using the oceans, seas, and marine resources. Healthy oceans and seas are essential to human existence and life on Earth. By 2025, the goal is to prevent and significantly reduce marine pollution, of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

fish-farming, tourism, and industrial uses. Access to improved water and sanitation are fundamental human rights and fundamentally important for children's health and development. Although over 1,400 million square kilometres of the Earth are covered with water, only 0.001 per cent of this water is readily available for human consumption. Furthermore, there is huge geographical variation in access to consumable water across continents, regions, countries, and even within countries. Despite water being vital for nature and human life, it is often taken for granted and poorly valued. Ensuring global access to safe, clean drinking water and sanitation is a major challenge confronting all humans today.

Background

The Norwegian geographic location, with a long coastline facing the North Sea, the Atlantic Ocean, and Skagerrak, makes Norway a coastal country. The maritime life there, in both work and leisure time, makes Norway a host of maritime history and culture. In recent times, the oil and gas industry as well as salmon fish farms characterize many places by the coast. However, from early times, the coastal landscapes have hosted seafarers, Vikings, and local fisheries. What is less known is how children make the meaning of these landscapes and how coastal landscapes and cultures shape conditions for their worldviews and knowledge about coastal landscapes and ocean life and culture. However, we can anticipate that the children growing up in coastal communities will have childhood experiences connected to the sea landscapes and work life there (Kjørholt, el. Al. 2021). Research has, so far, inadequately reflected how early childhood education facilitates emergent ocean literacies.

Early childhood years are fundamental for human development. In these formative years, children sense and explore the world in which they live. When experiencing the coastal and marine milieu, children's motion and emotions are central to how they perceive and build values and form aesthetic concepts about oceans. Families, early years institutions, communities, and media, condition how children make sense, what they learn, and what they value about their local landscapes. These perspectives give valuable and innovative insights and knowledge to the debate of how education can contribute to the climate and sustainability debate and politics.

Short Presentation of the art project: Ocean Portrait
The project was conceived as a relational art project where the explorative action and relational experience were central. The art project was a collaborative initiative

between Kunstpilotene [The Art Pilots] and BARNkunne [KINDknow – Research Senter. It was funded by the Arts Council Norway, Bergen City, Vestland County, KINDknow, and Western Norway University of Applied Sciences. The vision was to create an exploratory and sensorial activity for children and staff in kindergartens that could trigger their care for, interest in knowledge, and expressing experience and knowledge in biodiversity as well as coastal landscapes and culture. The project was conducted in three kindergartens. It was important for the artists that the process in an art event would be holistic and include space for collective as well as for individual exploration, experience, and expression. It was inspired by the sensuous, aesthetic, cultural, and poetic aspects of oceans; nature experiences were seen as inseparable from sensorial experiences. The children were invited to a series of explorative events over six weeks, first exploring the wood, searching for small items, collecting in a small bag, and taking care of it; next, exploring the beach and searing for a small stone, and establishing a sensual relation to the stone, by noticing its shape, colour, smell, and feel. Moreover, the children were invited to explore the world map, in paper and in fabric, playing, storytelling, and imagining with the map by using the stones transformed to boats, sea monsters, birds, crabs, and deep-sea creatures. After that, cutting the paper map, collected the paperclip in a small container, and let it soak in water collected from the beach until it became a paper mass, carrying all the stories and fantasies. They were then invited to create paper from the paper map, using the small items previously collected and to paint their ocean portrait. In between the sessions, the kindergartens were provided with inspirational books, art books, ocean paintings, stories, and fairytales connected to sea travels and coastal life as well as natural sciences books. You can read Kunstpilotene's report (Marandon, 2022) for more details.

Short Presentation of the research project: One Ocean Exploration

Following alongside the One Ocean Portrait and adding to One Ocean Exploration is a project about young children's ocean exploration, the biotope close to the ocean, and their emergent ocean literacy. The One Ocean exploration project grew out of a research effort by the KINDknow research centre on ideas on Play and Exploration and how play imagination was entwined in explorative dynamics and could be traced back as a signature of early pedagogics of the kindergartens (Ødegaard, 2021).

This report focuses on disseminating narrative accounts to illustrate “Children’s emergent literacies”. The research project included outreach, such as workshops with children, staff and communities, and older adults, and three master projects, two of which are still ongoing. The design will follow below.

Short about the background for the merge of projects

In the fall of 2019, our university, Western Norway University of Applied Sciences, was contacted by the One Ocean Expedition project – a worldwide climate voyage by the tall ship Statsraad Lehmkuhl inspired by the UN Decade of the Ocean. Researchers at KINDknow research centre responded immediately to the university’s call with a suggestion to contribute with a project connected to early childhood education. The One Ocean Portrait project was developed as a co-creation process for mutual benefit between the Arts Pilots [Kunstpilotene] and researchers at KINDknow research centre. The Arts Pilots was funded by the Arts Council, Norway, the City of Bergen, Vestland County and by the KINDknow Research Centre. The Researchers were funded by Our University and the Research Council Norway [The KINDknow project Number 275575].

The original plan was to include kindergartens in Norway at the coast of the North Sea and kindergartens in China at the coast of the East China Sea. The global voyage Statsraad Lehmkuhl was supposed to go to port in Shanghai the fall of 2022, and the One Ocean Sea Portrait project was supposed to have an exhibition at that occasion. However, in 2020, it was clear that the COVID-19 pandemic put a stop to the Chinese part of the project. Therefore, the project continued as a project with one pilot kindergarten in Bergen and two kindergartens in Øygarden. Later, a third kindergarten in Øygarden was included with an angle of intergenerational engagement. The project has had numerous adjustments, partly due to the pandemic and partly due to the research design as a locally anchored project. The research design followed principals of adjustments to the place, landscape, and institutional rules, regulations, and pedagogical principals in each kindergarten. The project also had aspects of co-creation among the participants. We also used a pilot project for opportunities of experience. During the project period, the project expanded with bud shooting projects including a post-doc researcher, master’s program students, and professional photographers and filmmakers. To continue reading about the project design and a

more detailed description of participants and procedures, proceed to chapter three.

Aims and research question of the project

This project brings together humans and the material environment. The ontological perspective is following what Donna Haraway calls ‘nature–culture’, as a way of signifying the inseparability and entanglement of the natural and the cultural (Haraway, 2016) as well as valuing culture and nature responsive approaches and dialogical practices (Ødegaard, 2020). Children’s exploration, imagination, and sensorial experiences in the biotope connected to oceans is the empirical base.

The overall aims of the One Ocean Exploration project were the following:

- 1) Give awareness and voice to the youngest children’s meaning-making of oceans and waterscapes to the debate of the ecology of oceans, climate, generational justice, and environmental sustainability.
- 2) Develop and expand the understanding of what emergent ocean literacies can be for children at an early age and how to develop such literacies.
- 3) To reveal new possibilities through storying experiences and practices upon aspects of life underwater and by the sea.
- 4) To awaken creativity and children’s playfulness and exploration as possibility through arts experiences.
- 5) Enhance a pedagogical culture for children’s exploration connected to coastal landscapes.
- 6) Create knowledge about the meaning of co-creation processes in education for a sustainable future.
- 7) Help weave stories that bring oceans, landscapes, and community together.
- 8) Contribute with an understanding of how local practices align with the international global agenda for sustainable development and sustainable development goals (SDG).

As the project has developed, the topic of *emergent ocean literacy* has become a superior concept and a pivot point for the project.

The enquiry bring will answer to the following questions: *What characterizes children’s emergent ocean literacies? How can children’s emergent ocean literacies be developed through early childhood education? What are the critical lessons learned from a collaborative project with diverse stakeholders?*

The structure of the report

The report comprises the following chapters:

In Chapter two, we will give background information about the overall project One Ocean Exploration by referring to the Decade of Ocean Science for Sustainable Development 2021-2030 and briefly describe the One Ocean Expedition – a trigger for the project. Chapter three will briefly present the epistemology and key concepts. Chapter four will present narrative accounts, pick up on selected topics of experience, and raise arguments. Chapter five addresses developing explorative art workshops for children on the topic ocean live below water. Chapter six discusses the dilemmas and disruptions as well as how we handled them. Chapter seven presents a summing up of the findings. In the last chapter (8), we discuss the recommendations for further projects related to children's emergent ocean literacies. You will also find a list of the disseminations and outcomes from the project as well as a list of photos and visuals.

Chapter 2 - Situating the One Ocean Exploration Project

In this chapter, we situate the project within a sustainability context.

The Earth has one big ocean with many features, and the ocean and life in the ocean shape the features of the Earth and are a major influence on the weather and climate. The ocean supports a great diversity of life and ecosystems and makes the Earth inhabitable. This also includes humans, who are inextricably interconnected with the largely unexplored ocean. These are the essential principles of the ocean that every ocean-literate person should understand (Fauville et al., 2019; Santoro et al., 2017; Schoedinger et al., 2005). In addition to this, ocean literacy is often aligned with the objectives of environmental education as defined by UNESCO in 1975: Awareness of and sensitivity to the global environment and its allied problems; attitude, values, and feelings of concern for the environment; motivation to actively participate in environmental improvement and protection; skills for identifying and solving environmental problems; and participation to be actively involved at all levels in working towards the resolution of environmental problems (Fauville et al., 2019).

Situating One Ocean Exploration with a framework of early childhood education for sustainability

According to the UN Convention on the Rights of the Child (1989), children have the right to be heard in matters that concern them. While there has been a move to take children's views into account more generally, very little attention has been given to listening to young children below the age of six or seven (Clark, et al., 2005). There is a need to find new designs for research that is tailored to young children's development and to their sensorial, bodily, and explorative way of playing and being in the world. Article 12 states that children shall be free to form their own opinions and freely express them in all matters that concern them, and that children's opinions shall be weighted according to age and maturity. In 2009, the UN's child committee gave a general comment that early childhood education and research challenges the society's view of what is knowledge and who has the right to express themselves and that children can express themselves nonverbally. This decision is of vital impor-

tance in the future of the ocean. Sustainable futures and the vision about One Ocean give obligations for future generations. Such a perspective is crucial in the One Ocean Exploration project. Therefore, this project is designed as a response to this challenge and has creatively and collaboratively co-created the project with the intension of letting the children explore and express themselves.

Kindergartens in Norway are pedagogical institutions providing early childhood education and care for children aged 0-5 years and follow the National Framework for Kindergartens content and task (HK-DIR, 2017). According to this framework, sustainability covers the natural environment, cultural, economic, and social issues and is vital to preserving life on Earth as we know it (p. 10). Kindergartens are, therefore, given an important role in promoting values, attitudes, and practices for more sustainable communities, even if it is obvious that the world's ecological crisis needs systemic change (Fettes & Blenkinsop, 2023). Regarding knowledge about the health of oceans and the ecological crises, education, especially early childhood education, is largely absent from that literature despite clear evidence of its role in contributing to the change and solving the crisis (Fettes & Blenkinsop, 2023).

In relation to the what is stated hereinabove, the arguments of Ingrid Engdahl and Ann-Christin Furu (2022) are noteworthy. They document the activities of the World Organisation for Early Childhood Education (OMEP) and have argued that, even if there is a growing body of research showing that early childhood education and care (ECEC) settings are important arenas for early childhood education for sustainability, these studies are seldom recognized in national or global reviews on sustainability topics (Engdahl & Furu, 2022). Furthermore, since 2008, OMEP has run global projects for sustainable development in early childhood and OMEP national committees have participated in 1,200 ESD projects in 35 countries, reaching 150,000 young children (birth to eight years old). Most of these designs and practices emphasize children's empowerment and agency (Engdahl & Furu, 2022). However, to our knowledge, the initiatives from OMEP have not, to date, focused on the UN Decade of One Ocean or the Early Childhood research network Transnational Dialogues.

Situating the project scientifically as Ocean literacies research

Education for ocean literacy has been foremost situated at the intersection of environmental education and STEM education (science, technology, engineering, and mathematics) in primary and secondary schools. Less is known about how ocean literacy starts out in early childhood education and what characterizes the children's meaning-making when they are afforded daily, arts-based and natural science educational opportunities for exploration as well as enquiries connected to ocean and coastal landscape topics.

In the Ocean Literacy for all toolkit report (Santoro et al., 2017), Ocean Literacy has seven principles;

- 1) The Earth has one big ocean with many features
- 2) The ocean and life in the ocean shape the features of the Earth
- 3) The ocean is a major influence on weather and climate
- 4) The ocean makes the Earth inhabitable
- 5) The ocean supports a great diversity of life and ecosystems
- 6) The ocean and humans are inextricably interconnected
- 7) The ocean is largely unexplored

(Santoro et al., 2017, p. 19).

Anne Trine Kjørholt introduce the concept Literacies of the sea, to show how children learn particular ways of being, living, and knowing. Her outline *literacies of the sea* reflects an 'embodied sense of place, pointing to the significance of nature, materiality, and interaction with the sea' (Kjørholt, 2023, p. 101).

These principles from the above-mentioned relevant literature intersect the ecosystems of oceans with those of humans. This intersection between culture and nature is necessary, but noted as not new (Haraway, 2016), nor is the intersection between play, imagination, holistic approach, and learning (Kagan, 2011). In kinship with these ideas is deep ecology, as proposed by the Norwegian philosopher Arne Næss. He was an important agent for ecological thinking in the Norwegian society and beyond. Næss urged holistic thinking and play imagination to understand the world (Mejlænder et al., 2007; Næss, 1989;

Næss, 2005). Næss even had clear visions and ideas about high-quality early childhood education and created a link between researchers and teachers. He recommended that all children get access to '*patches of free nature*' and that teachers, as researchers should identify themselves with being 'seekers' (Jickling, 2000), p. 57). In this project, we enquire about how these visions and ideas can add to the educational approaches to sustainability and to our understanding of ocean literacy for early age children.

More research is required to understand how human life and activity are connected to nature; at the same time, this research can help practitioners develop opportunities suitable to their local landscapes and cultures. There is still much we do not know about the ocean, and we argue that it is difficult to engage with and build this new knowledge without the anticipation of children's movement, play imagination, and exploration. Researchers involved in the area of sustainability have even suggested that perhaps the challenge of sustainability is to prove that the world is more imaginary rather than to prove that the world is more real (Kagan, 2019). Sacha Kagan writes about the importance of imagination in sustainability education and argues that it must be understood as a deep symbolic matrix that enables our access to the world: '*Imaginaries are not just made up and imposed on the world by the humans, but the result of an imaginative encounter with the human and other-than-human world*' (Kagan, 2019, p. 157). This makes sense, as we look at the connection between human history, myths, and stories of the sea, coming from living in a sea and ocean environment, and trying to understand the natural phenomena that humans experience.

Within the field of early childhood educational research, we note substantial evidence supporting the significance of local ecological knowledge to education, often expressed as stories, discourses, traditions, and practices. Some research is anchored in sensory materialism, and some research tries to build bridges between education as a cultural-historical, artistic, and anthropological endeavours and promotes the value of local ecological knowledge (Grindheim et al., 2019; Malone, 2019; Myrstad et al., 2022; Somerville, 2013; Ødegaard, 2015a; Ødegaard & Marandon, 2019).

Even if there are studies in the field of early childhood education that bridge culture and nature, most educational studies on ocean literacies reference higher education and university studies. Therefore, there is a need for giving more attention to earlier education focusing specifically on ocean literacy (Santoro et al., 2018).

Based on the previously mentioned efforts at the interdisciplinary bridging of arts education, pedagogy, and local ecological knowledge, this project explores an overall research question that focuses on developing practices: *How can an early childhood education art- and landscape-based approach broaden the concept of children's emergent ocean literacy?* This question concerns applied practical relevance in early childhood education (Wallerstedt et al., 2023).

While literacy is often narrowly understood as learning to read and write, an increasing body of educational research explores more forms of knowing and being. Criticisms and warnings have also been expressed regarding a narrow approach to education and 21st century skills, where teaching for tests predominate (Kagan, 2011; Willbergh, 2015). Thus, this project outlines how an understanding of the relationship between a sensory body, imagination, place (local and global), and relational talk might inform pedagogy by highlighting rich and varied opportunities, such as sensory and performing arts and a pedagogical approach that entails landscape and ecological awareness.

The Decade of Ocean Science for Sustainable Development (2021–2030) is a UN initiative promoting a common framework for supporting stakeholders in studying and assessing the health of the world's oceans (UN, 2020). This initiative is boosting Sustainable Development Goal (SDG) 14: *Conserve and sustainably use the oceans, seas, and marine resources for sustainable development*. The Ocean Decade intends to promote an increased understanding of the need to take urgent actions to maintain a life-supporting ocean and ensure adequate protection and adaptive management of the marine environment. These intentions shall enhance understanding and create a new level of awareness among the public. The goal is also that this understanding should trigger and forecast future capabilities, change, and articulation of relevant new knowledge (UN, 2018).

This global UN initiative presents a vital opportunity to transfer ocean literacies to the next generation, the very young children. The role of education in particular is not mentioned in the document; nevertheless, it has sparked local initiatives around the world (e.g. the United Nations Ocean Decade – Children Oceanic Pottery project UNESCO (2022)). Children who live by the sea are significantly affected by climate change and ocean pollution; as they are dependent on the food supplies from a clean ocean in the future, the relevance is obvious. Childhood is often seen as a sheltered world unto itself, but the realities of a diverse society as well as an increasing awareness of the impact of climate change and health concerns due to pandemics have given rise to an entirely new range of childhood experiences. An often-forgotten dimension is that of childhood and the experience of being a child. Ocean education ought to have a long-term perspective, which must include the experiences of the young children of today.

In order to better tailor literacy approaches to the youngest children, we designed the pedagogical approaches within an play, arts, nature, and exploration tradition (Fröbel & Hailmann, 2005). Aims such as awakening creativity and children's playfulness and exploration as possibilities through art experiences have a long tradition within early childhood education (May 2022; Peters, 1951).

Chapter 3 – Designing a project for collaborative exploration, playful imagination, and sensory experiences

Our study emphasizes how we all are biosocial humans (Hedegaard & Ødegaard, 2020; Ingold & Gíslí, 2013) as we sense through the movement of our body, we explore and learn as we walk and inhabit the landscapes, and we are entangled in the ecological mechanisms (Ingold, 2010b). Furthermore, the project is about the cultural and historical aspects of life, how a material condition, such as a sea landscape, carry human traces and can change over time and due to material conditions, such as weather and cultural conditions such as humans use of landscapes, but as important, in this project are how landscapes carry and elicit emotions, values, beliefs, motives, imagination, and memories (Mejlander, Næss & Næss, 2007; Ødegaard & Marandon, 2019). Even if we say *one ocean*, which is a truth, seen from a geographical and metaphorical perspective, *one ocean*, might not be true if we see it from the perspective of culture, politics, and memories. For example, a childhood memory of living by the seaside in India could be loaded with sensory memories of smell, aesthetics, scenery, and cultural meaning that are very different from a sensory childhood memory of living by the coast on an island on the North Sea.

To search for knowledge about the ocean and life in the ocean, a condition for ocean literacy, one needs engagement, a driver to connect the three dimensions of time, place, and sociality. Ødegaard's model 'Exploration as dialogical engagement' serves as analytical tool for a pedagogical approach that values culturally responsive practices, and exploring practices and worldviews of sustainability, very much in line with the design of the arts project Ocean Portrait. In this model, culturally responsive and sustainable pedagogical practices include six primary principles. These are collaboration with stakeholders and partners, openness towards the world, an interest in children's and family's experiences, and stories. These principles would facilitate for co-creation of meaning, imagination, and improvisation in everyday activities. Moreover, the principles are enquiry and curiosity towards multiple ways of knowing. Furthermore, the acknowledgement of emotional and performative as well as academic know-how stems from a holistic approach to living and learning and will call for the variation of cultural resources in the project (Ødegaard, 2020).

Imagination allows taking some distance from the here-and-now, from experience and allows to explore, reread the past, or open possible futures in order to consider alternatives. It could be triggered by a temporary rupture between the previous experience of the material, embodied, and socially shared world. Imagination could be playful, it could also be rich in emotions, or it could be a basis of discovery; we can call this daily creativity. Imagination is a form of exploration with aesthetic aspects and necessary to human formation and innovation as it can potentially expand what is otherwise possible in a given state of cultural-historical constraints and conditions. According to this understanding, imagination converts and expands human experience (Zittoun & Charchia, 2013).

Imagination is relevant to this project as it takes departure in an arts project that is designed to disrupt the here and now experience by giving attention to the aesthetic and sensorial, material, and cultural aspects of the ocean, it encourages imagination as well as introduces representations of the world, such as maps. For example, when we are encouraged to look for a tiny stone, establish a relation to the stone, by exploring how it can change colour when going from a dry state to a wet one, when we bring it into the water, when we can recognize our selected stone, by its shape, when we imagine that the stone is a boat that carries us across the oceans on the map, when it transforms to a shark, a sea-monster, a deep water species, the stone is a stone to find, touch, carry, feel, smell, and imagine being something else; our stone can represent something imaginary, something abstract, or something to be explored in a personal thinking process, but triggered in the material and bio-social world.

Language and story are fundamental to the project as they shape our human capacity to make meaning, understand, and act in relation to the local landscapes and persons we meet as well as to the more abstract notions of the outreach and depth of the global ocean and the planetary relations and impacts of oceans.

Landscapes and critical events shape our language and is also being transformed by words (Mertova & Webster,

2020). For example, Ingold's approach to the anthropology of landscape involves concepts such as *dwelling and livelihood* (Ingold, 2011). These concepts do not identify a distinction between natural and human. Humans dwell in landscapes when walking, hunting, fishing, picking, and building shelters for survival. The concept of a landscape (in our context coastal landscape) is, therefore, not only a vision; it is to understand the perceptual vision of the coast and the ocean, being there, and experiencing how the weather impacts the coastal landscape, these things are best learnt by walking and living with the landscape, humans, nonhumans, and cultural artefacts (Ødegaard & Marandon, 2019).

Sensations, emotions, experiences, stories, and language are such carriers of engagement and start early in human development (Ødegaard, 2006, 2007a, 2021a). Sensing a *place* is a universal genre of experience (Caine et al., 2022; Mark et al., 2011; Ødegaard, 2023) that cannot escape the political, societal (Fleer et al., 2021), and environmental conditions (Grindheim et al., 2019).

Personal experience from teaching and living with children as well as decades-long research among children bring to mind stories of children's exceptional ability to make meaning and taxonomy from lived life and where the landscape itself affords conditions for what to sense, explore, and learn (Adolph et al., 1993; Ødegaard, 2012; Ødegaard & Marandon, 2019). Let us illustrate this with an example from walking alongside children; we could notice that one of the boys we met could name the sea animal and variety of seaweeds in any marine book afforded to him. What seemed like a deep interest had been triggered early, after experiencing going fishing with his family during summer, experiencing talk, picture books, bodily movements in coastal landscapes, and on the sea, being exposed to various sensations and after repeatedly visiting the city aquarium. He had been invited to partake in ocean literacy events both in sensory, relational, and academic ways and he shared his experiences and knowledge with convincing enthusiasm.

Composing narratives is best enacted by going alongside, tuning in to people and landscapes, co-exploring with the participants, and being aware of values and emotional triggers in the researchers' minds as well as in the participants. When children take part in narrative talk in families and kindergartens, they engage in an essential cultural mould for exploring and understanding the world in which they live. The collaborative narrative is a powerful cultural artefact since such talk brings up events and themes for explorative and elaborate conversations.

This genre opens for meaning-making and opportunities for a deeper understanding of the world. Engagement in collaborative narratives also support children in using language, naming the world, and will create rich bonds between people and the topics of the conversations (Ødegaard, 2007).

Collaborative engagement, whether it would be collaborative exploration or collaborative narrative, is based on interaction between adults and children and have long been identified as beneficial to children's growth and development. In intergenerational dialogues, as seen in one of our studies, young and older adults pass on cultural heritage by stories, by actions such as a boat trip and in restoring boats. As a response to the call to strengthen intergenerational cooperation between generations and different actors in society towards sustainable futures (Oropilla & Ødegaard, 2021) and the importance of visualizing these processes and approach (Oropilla, Ødegaard & White, 2022), we designed for intergenerational meeting points in one of the kindergartens.

Understanding a child's experience, or oneself and a research team, as engaged in activity with an approach of going alongside the participants is a matter of understanding experience as a narrative becoming in (time), spatial (place), and relations (sociality) (Caine et al., 2021; Clandinin et al., 2016). This does not mean that stories are studied as personal; on the contrary, individual experiences are seen as social, cultural, and institutional. Individual narratives are constituted, shaped, expressed, and enacted in the world (Clandinin, 2016). Our ethnographic approach learns from Narrative Inquiry as it comprises a view of experience composed and lived over time (p. 15). In our study, place refers to the coastal landscapes both as cultural and historical marine places as well as sensorial experiences of places, and sociality refers to how living, exploring, and expressing the enculturation with the use of cultural artefacts such as when the participants are doing and playing arts and the ocean literacy are shared and enacted.

Emergent literacies

While the concept of literacy often describes particular ways of thinking about and practising reading and writing with the purpose of understanding or expressing thoughts or ideas through language and culture, the concept of *emergent literacies* includes an extended interest in the sensuous body and the environment. Emergent literacies are, therefore, a developmentally appropriate concept for understanding young children from birth, and to design-

ing a pedagogy and holistic approach for early childhood education.

Patricia M. Cooper reviewed the relevant research literature in a study on literacy learning and found six essential literacy approaches which have been proved to be vital for the development of emergent literacy (Cooper, 2005): She mentions oral language, narrative form, convention of print, code, word study, and reading for meaning (Cooper 2005, p. 238).

Emergent literacy is a developmental process beginning in infancy that includes elements and skills supported by brain regions that must be adequately stimulated and integrated to form a functional grid for the understanding and use of language (Hutton et al., 2021). These trajectories are associated with genetic, medical, and environmental factors. Children's meaning-making is a multifaceted, complex experience where thought, body, and emotion merge. It comes to life through dialogues with humans who name the world for the child. This naming is never neutral; the pointing, naming, showing, and telling come in a context and with connotations with emotions and values. The naming of the world is relational and becomes children's language expressions through their interpretation of 'signs', which stand for or represent something real (Ødegaard, 2007b).

We tend to imagine what we cannot see but need to understand. In order to develop Ocean literacy, when the ocean is not in reach for the senses and bodily experience, imagination takes over. The human body is wild with its senses, circulation, respiration, and digestion. The human mind, imagination, and even natural human language can, therefore, also be called wild. Mark Fettes and Sean Blenkinsop (2023) argue that when human communities stopped living in close and reciprocal kinship with a wide variety of wild beings, 'their capacities of attention, thought, imagination, and relationship slowly shifted towards simplified, binary, control-oriented cultural forms as a kind of self-domestication' (p. 2).

Emergent ocean literacy

We propose *Emergent Ocean Literacy* as a concept better suited to understand the interconnections between humans, how they sense, explore, and name the more-than-human world and how the human and the non-human world, such as the landscapes and the weather worlds, are connected (Ingold, 2011). *Emergent Ocean Literacy* can be observed by paying attention to how children engage with meaning through the senses and

also experience through words, naming, and concepts (Heppner, 2016).

In a study of the intersection of health and climate and ocean stability, the research points to defining actions and changes needed to engage and empower young people in achieving climate and ocean sustainability during the UN Ocean Decade and beyond. As a consequence of climate change, extreme weather events are increasing in frequency and severity. This agenda poses a significant threat to population mental health according to the evidence of a recent literature review of 17 studies. The authors suggest that the prevention of mental ill health in populations at risk or exposed to extreme weather events should be a UK public health priority (Cruz et al., 2020).

Marine education

Ocean literacy is often connected to, among a range of multidisciplinary topics, marine education, which includes learning about the global seas' relationship with all world systems and society's influence upon that sea (Chang et al., 2021). Ocean literacy implies the transmission of knowledge about the ocean and its importance as well as the common responsibility we have towards the seas, oceans, and resources, which is something that has been identified as one of the essential predictors of environmental behaviour and education.

The Blue School programme originated in Portugal and certified that schools offer an ocean curriculum to their communities. The Blue School concept was developed with eight associated criteria that directly contribute to SDG 4, 14, and 17. The Blue School initiative contributes to increasing global awareness of ocean issues among students at school, but also across generations and among local communities, as it stimulates active citizenship in respect of the ocean (Koutsopoulos & Stel, 2021). This initiative represents a true ocean literacy movement with a huge impact. However, to date, its principles and ideas have not really included the early childhood years.

According to Wu (2018), there is a strong relation between environmental sensitivity imparted to children through everyday life experiences and education and the emotional basis for the development of an ecological worldview, knowledge, and personal norms for pro-environmental actions. From the perspective of early childhood education for sustainability, Wu's findings are of major importance. We can now see efforts to change the model for teachers in respect of early childhood development, where sustainability rhetoric and sustainability policy are

brought to the forefront of national curriculums (Li et al., 2019; Ødegaard, 2015b).

Data creation – Going alongside children in places that matter

The project followed participatory and ethnographic procedures for data creation, as briefly already mentioned and as illustrated below in Table 1. The researchers, artists, and staff all contributed to the notes, photos, films, and stories. First and foremost, the study is based on the researchers own fieldnotes and photos and short videoclips, but we also draw on the filmmakers' videos as additional data. As a supplement, we also invited the staff to write notes and narratives about children's exploration and meaning making in relation to the project. The project lasted six weeks in each kindergarten, totalling 24 weeks. The staff agreed to engage in participatory observations in a flexible manner, attuned to whenever the topic of ocean landscapes came up in everyday conversation, both planned and spontaneous, while reading books on ecological and marine topics, telling stories about real life or fantasy relating to the sea, and when walking and exploring the local ocean landscapes on local outdoor excursions. They participated in the planning and evaluation of the project and, on this basis, we tailored the project to each kindergarten. The artists, photographer, and researchers participated with each kindergarten for ten days over the six weeks. Five days with the children and additional days were spent in the kindergarten and at the selected bay, for planning and evaluation. Familiarization with the place was important for the quality of the engagement with the children. The artists led the activities at the shore and the process of making the paper. The researchers participated and engaged in collaborative exploration with the children when appropriate.

This inquiry took place on the west coast of Norway. First, we piloted the art project Ocean Portrait in a marine kindergarten outside Bergen. Afterwards, we carried out the same arts project in two more kindergartens and, affiliated with the arts project, it was a research project with a special interest in studying how collaborative exploration unfolded through a period of six weeks in everyday life as well as during the arts events.

Furthermore, we carried out an intergenerational project to bring about co-creations and intergenerational collaborative narratives (Ødegaard, 2023) involving children's

parents, grandparents, and local older adults to be engaged with the children in different activities by the sea such as drawing, paintings, trips to the boat house, and a fishing boat trip. An intergenerational community approach involves the creation of intergenerational contact zones and intergenerational engagement of older adults and younger children (Kernan, et al., 2019; Sanchez & Stafford, 2020). Intergenerational engagement entails pedagogical resources and reservoirs of local and intergenerational skills, experiences, and knowledge, that play key role in the formative experiences of children as they live in families, early childhood institutions, and communities (Kjørholt, 2023). In a recently concluded PhD project highlighting the importance of intergenerational engagements and programmes in ECEC, inspired the involvement of kindergarten children and older adults in the local community (Oropilla, 2023). Here, we also created narratives in fieldnotes and conducted videos from key events. In addition, three master students' projects were attached to the projects with the same research approach: narrative writing in fieldnotes and video/photos.³

Three of the kindergartens were located in Øygarden municipality, on the island Sotra, facing the North Sea. Here, a traumatic event took place on January 28, 2017, but at the same time this event created hope for many places around the world. A sick goose-beaked whale found its way to shore and died there. Its stomach was filled with 30 plastic bags and many smaller pieces of plastic. The scientists investigating the whale supposed that the whale was emaciated because the huge amount of plastic that had collected in its stomach had created a plug, stopping the digestive process. Later, we learned that this local news had become global news. The story of the 'plastic whale' has become a critical event narrative (Mertova & Webster, 2020; Woods, 1993) used in art exhibitions across the world to communicate human damage to ocean life, and the 'plastic whale' has also been conceptualized in green and blue businesses. The 'plastic whale' seems to have become incorporated in a new global collective memory and is used as a metaphor for a clean ocean. This memory was among the inspirations for the researchers to approach kindergartens on the island to collaborate in a project related to the UN Decade of Ocean Science for Sustainable Development. The present study will disclose that children not yet born in 2017 still have the collective memory of the whale who had eaten plastic and died on their local shore.

Data type	Details and character of the data material
Staffs logs and narratives	Events documenting children’s interests, experiences, and exploration connected to the biotopes between the land and sea or ocean. All three kindergartens provided us with observational notes and short stories.
Film photographers’ videos	Kindergarten 1: 15 hours; kindergarten 2: 3 hours; kindergarten 3: 15 hours.
Researchers’ logs and photos of activities	Two researchers wrote ethnographic notes.
Researchers’ logs of planning and evaluation	<ol style="list-style-type: none"> 1. Planning beforehand (owner, artists, photographer, and researchers) 2. Planning in the kindergarten to adapt the project to the local circumstances and landscapes (staff, artists, researchers) 3. Communication while engaging in the project (all) 4. Evaluation: conversation with selected staff from each kindergarten 5. Summing up: evaluation and identifying criteria for success (all)

Table 1: Data material

³ The master studies will only briefly be mentioned here since not all three theses are finished as we write this. More details will be found in their master’s theses. The master projects were led by: Monica Gustavsen (2023), Andrine Kongshaug, and Janne Torsvik (expected to be published in autumn 2024).

Chapter 4 - Storying Emergent Ocean Literacies

In this chapter, we will share excerpts from field notes and photos from the project of One Ocean portrait and the project of Intergenerational engagement. The field notes were composed as narratives, and later rewritten following the participatory ethnographic tradition of storying: manoeuvring and engaging between participants, storying, telling, and retelling (Blomberg & Karasti, 2012). For us, education is interwoven with living and with the possibility of retelling our life stories. As we think about our lives and the lives of the teachers and children with whom we engage, we see possibilities for growth and change. As we learn to tell, listen, and respond to teachers' and children's stories, we imagine significant educational consequences for children and teachers in schools and faculty members in universities through more mutual relations between schools and universities. No one, and no institution, would leave this imagined future unchanged.

Imagination with stones and maps

One of the kindergartens was situated a five minutes' walk from Spildepollen bay. We passed some boathouses, some small boats, and a supply boat for the oil rigs to go down to an area of about one acre of land, a green field of grass sloped down towards a stony shore. The April spring had brought cuckoo flowers on the field and in front of a rocky area; sheltered from the wind, there was a small area of birch, willow, and hazel bushes with fresh green leaves.

Figure 2. Sensing and imagining the ocean, photo Åsta Birkeland



We went with a group of 12 four-year-olds and two staff to the bay, but the kindergarten had been there with the group the day before to clean the beach of plastic. This was a regular spring activity for this kindergarten. The artists were already there on the field from the early morning, to put up a field tent, and so we could get some shelter from the rain during the day. It was one of many cold rainy days with wind, and so we were all dressed up in rainwear, rubber boots, and mittens. The field was appealing for the children, and some of the children immediately started to run, jump, and roll down the slope. The first common task for the day was to find a small stone, our favourite stone to explore. This stone should also help us to discover colours and shapes. How the stone looked when dry and how it changed when laying under water. The sea was dark this day, and when we went wading at the water's edge, we could see through the water. We could see stones that had different colours and shapes. We could feel the water – it was cold – and we could feel the movements of the waves through our rubber boots. We also discovered groups of small fish that disappeared as soon as they were discovered. The beach also had sea anemones and shore snails. The children were acquainted with the life and respected them to let them be. Each one of us carefully chose a tiny stone and we cared for it, look at it, put it in the water again and, at the end of the day, the artists collected them for us all in a box, a collection of small stones for later use. (Excerpts from researcher's notes)

Figure 3 The world that binds us together and keeps us apart, photo Elin Eriksen Ødegaard

The above fieldnotes and figure 2 illustrate how the project allowed us to explore the landscape and discover details in the biotope between the land and sea. The kindergarten allowed the children to wade into the sea. This created unique moments of feeling in direct relation with the cold water, and we could feel the movements. This experience was fascinating; the children walked and watched for a long time, and it was as if they had found their home element. Children's attraction to water has also been noted by other early childhood researchers who have emphasized the more-than-human relational experience (Ødegaard, et al., 2023; Djohari et al., 2018; Pacini-Ketchabaw & Clark, 2016; Somerville, 2013). The task of finding a stone of one's own choice was appealing to us all; we became connected and noticed many aesthetic and sensory details, like the cold and wet feeling when reaching out to pick a stone as well as the shape, colour, taste, and smell. To select and study the small stones gave the children a new repertoire on the aesthetic qualities of a stone and what it could represent. Throwing stones in the water, which is often the main repertoire of children on a stone beach, was not a dominant activity here.



In Figure 3, we can see the children and artist working together on playful imagination and storytelling. With the world map enrolled between them, they engage with storytelling with their previously selected stone in hand. The stone could be a fish, a deep-sea creature, which they previously had read about in a book, or a boat travelling across the oceans. They could study the map and figure out the name of the oceans and the countries. They could find Norway and their island and see the North Sea stretching out, all the way to England and Denmark, meeting the Atlantic Ocean. They could tell stories of own travels or travels of heroes. They could meet people or sea creatures. We staged metaphorically that the ocean is what binds us together and what keeps us apart. The artist encouraged keen awareness of the senses, the shapes, textures, and colours in nature when exploring the map through play imagination with the stones we had previously search for and carefully chosen:

I could feel the mild wind across my cheeks when sitting down by the world maps. I asked a boy who came to sit close to me: Where does your stone belong? He put his stone on the Sahara Desert in Africa. His stone has a yellow tone, and I can understand his choice. The same colour as the Sahara Desert, I said. It could blend in with the sand there, I added. He told me that the stone could lay in the sand and moved it a bit, but still placed within the borders of the Sahara. He pushed the stone hard into the paper. I am thinking that he needs to be sure that it stays deep in the sand where it belongs. The boys gave me a smile of confidence. More and more children took part in the activity; they came with their tiny stones, drew its shape, and told stories. (Excerpts from the artist's notes)

In André's notes, he expresses a close awareness of the children. He captures details of the children's actions and expressions and narrates an understanding of the children's actions as meaningful, as when he expresses his own imagination of the child's motive for pushing the stone hard into the paper surface. What could be found here at the ocean and landed on the map? What could be discovered on the surface and what was hidden from us under the sea? These were questions that guided our conversations with the children.'

'This shark swims like this,' a girl said while drawing a line across the North Pacific Ocean. 'But here it stops,' she said. She was close to land by the Philippines when she stopped her shark line. 'Let us see,' I said. 'Look a bit closer, the sea seems to have a light-blue colour there.' She confirmed: 'Yes, the colour is light blue.' 'This means that it is not so very deep sea there,' I said. She moved her shark stripe gently towards the

south, in between Indonesia, Papa New Guinea, and Australia, and let the shark go when entering the Indian Ocean. 'Look at the treasure!' The boy, who had previously placed his stone within the Sahara Desert, reached out to me again. 'It was not so easy to see,' I said. He smiled mysteriously. 'It's almost in the middle of the playground,' he explained, and pointed to what he had drawn on the map. 'It's a monster and the monster kids,' commented another. He was adding some lines to where the treasure was found. 'There, there, and there,' he said, pointing his finger to the northern parts of Africa. 'No one must come there,' he said with horror in his voice. 'What happens then?' I asked. 'Then you'll be eaten,' he explained.

'That's just rubbish!' It was one of the girls commenting on her own drawing. She had a disappointing tone and expression. 'Nah,' I said slowly and looked at her drawing. 'It looks like seaweed to me. Maybe there is something hiding in the seaweed?' I suggested. 'Yes,' she said and drew a fish with careful strokes so that you could hardly see it. 'There is a lot in the sea,' she said. 'Both plants and animals and rocks,' I confirmed. 'And seaweed,' she added. Another boy discovered the seaweed just in front of us, it was a belt of dry seaweed just in front of him. He pointed, and I picked up a small piece of the weed and put it on the map. 'Yes,' he said, and started to draw around the weed. 'The seaweed must also have a place,' he said. The seaweed really set the imagination on fire. Several children started to draw imaginary sea animals in the ocean. Soon the ocean had sea crocodiles and plant crocodiles. I also drew some animals from the inspiration of the weed. The boy continued to draw further and further south on the (...) 'It reaches all the way down here,' he says. 'To the South Pole,' he continued. 'It's cold there,' I say. 'Yes, and everything turns to ice,' he confirmed. (Excerpts from artists notes)

This excerpt allows us to get close to the dialogue between the artist André and the children while working with the world map. The excerpt also illustrates how the project was designed for exploration and imagination, and how the children moved easily between reality and imagination (Zittoun & Chechia, 2013; Vygotsky, 2004). André offered geographical knowledge to the children when naming the oceans and the countries and taught the children how to read a map using colours (light blue means not so deep and dark blue is the deep ocean). He also accepted and encouraged the children's imagination. The children sat down to work with the drawing on the map for a long-time span. All the children participated, and all of them concentrated for a time span of about an hour. This demonstrates what Vygotsky claims in that these movements between reality and imagination, the adult naming and extending of the world, and being play-

ful and using their imagination are appealing to young children.

From a video transcript, we identified an event where collaborative exploration was unfolded with stones in Grøtvika, one of the beaches near kindergarten 2. It was a warm day in August, the sea was calm, and we spent many hours at the site, studying the waterscape, sea and exploring the pencil on wet and dry paper. It was after the painting session that Henning, a four-year-old sat down for studying a heavy stone he had found. He touched it, turned it around, and André, the artist, grasped the moment by selecting a heavy stone and joined in the conversation with him.

I found this stone there, Henning pointed to one side of the beach, I found it down by the ocean. André, responded to him, you found it there. Andre brought along the heavy stone he found, and then sat beside Henning; You found it by the ocean, but it seems all dry. Yes, because it has not been in the ocean. André studied his stone and looked at Hennings, does these stones belong together? They were kind of similar. No, I guess not, this one, is darker in colour. This one has stripes, he says about the one in his lap. Yes, said André, I wonder why this is has a light colour on this side, and is so dark on the other side, how come? Henning, took a close look at both stones, there is some light, he pointed to André's dark stone, look, I have also a light colour on this stone, he lifted his stone to show its light spots. If we find more stones like these, than we can pick them up. Yes, we can, we might collect them together, said André.

Then, the conversation transitioned into a narrative opening where the exploration of shoes are continued in a narrative genre: Do you know what, Henning, said to André, I have been here before, with my mother and father, They had boots and they had brought boots for me, but I had twinkling shoes. Oh, you had twinkling shoes, but could you enter the water with blinking shoes then? Henning admitted that he could not do that. But I put my boots on, and then I could walk in the water. André said: can you imagine if there was such a thing as twinkling boots? Then ,you could have walked the water with blinking boots and said hello to the fishes. Henning replied: If I go into the water with my jogging shoes, they will be destroyed. My mother told me that I should not enter the water with my jogging shoes. But they are not destroyed because my shoes can twinkle. How do you make your shoe twinkle then, asked André. Henning showed him and André confirms, oh yes, you need to press the button. And when I walk, they will twinkle. Do your shoes have a battery then? No, there are no batteries, answered Henning. Ok, so if your shoes stop twinkling, they are just

shoes, not twinkling shoes anymore. Yes, that is right, said Henning. My mother can clean my shoes.

The conversation then shifted into an exploration of seeds found on the boy's shoes.

André lifted his shoe and studied it. Oh look, some seeds have fastened on your shoe sole. And here is also some on your socks. Henning took a look: Yes, I have seeds. In the grass. André responded, oh yes, I guess they fastened to you when you were playing in the grass. I played in the grass when we went camping. And the conversations continued for seven minutes between the two of them; Henning told stories of how he hurt himself on holiday, and they went back to talk more about the stones they both held in their laps, during the whole conversation. They turned the stones around and felt them gently as the dialogue between them continued.

With this transcript, we can illustrate how collaborative exploration in fluent ways, transforms into narrative genre, and then back again into collaborative exploration. In addition, elements of imagery came into the conversation, when André, brought in the fantasy of twinkling boots. Since this conversation was the longest coherent conversation in the video data, it is of interest to find the conditions for it and the triggers. The conditions for such a long adult-child conversation was a relaxed atmosphere at the scene. Most of the children and staff were wading in the edge of the sea, looking for snails and living creatures, playing with stones and eventually running in the grass, behind the two dialogue partners. What nourishes this conversation? We can see that it is the child, Henning, who takes the initiative to study the stone and invites André in the conversation, in the flow of the talk, André shifts between the role of being a responding partner and initiate new elements to the talk, e.g. the imaginary twinkling boots. They were both interested in the stones they had found, and we can anticipate that the landscape inspired the talk, also Hennings story about being at beach with his mother and father. He established a connection to the place, by bringing his personal shoes and family into the conversation. Were there traces of emergent ocean literacy processes in this conversation? Topics about nature that was raised were connected to the characteristics of the stones and to the question of the reason for the stones shifting colours, and the seeds found on the shoe, none of these natural science topics were extended. Culturally, they established a relational space by talking about items at the scene. You can say that the condition for a growing experience with a local oceanscape was established.

What happened to the birds?

Some days later, we went to the beach, and we were again reminded of the changeable world on this permanent beach. This day, the artists had prepared shelters for us on the field close to the beach. It was a rainy and windy day, and the task for the day was to study a world map by playing with our stones. However, something else turned up on the beach: heaps of dead sea birds were lying on the beach and on the grass.



Figure 4. A dead sea bird with a flower, Photo Elin Eriksen Ødegaard

The children noticed the dead sea birds with curiosity and concern: What had happened to them? The adults all started to worry: What had happened here? Why were there so many dead sea birds today? One of the teachers told us that she had noticed dead sea birds some days ago and had already alarmed the Norwegian food authority, but they did not have any explanations on the matter or any clear recommendation. All the adults became insecure: What was this? Was it safe for us to continue in the area? Was it a bird flu? Could it be contagious to humans? Or was it something else? We decided to stay and to continue with our plans, but told the children not to touch the birds, to be on the safe side of an infection risk. One of the children picked a flower and lay it on top of one of the birds, but then we paid attention to the world maps we

had laid out beneath the shelters. Suddenly, all the children sat and lay around the maps, and we forgot about the birds.

After more than 90 minutes, with telling, drawing, and imaginative dialogues, we were cold, wet, and hungry. The teacher had a key to one of the boat houses, so we could eat in a dry facility. As we sat on the floor in the boat house and ate our lunch, the dialogue about the birds continued. The children brought it up again, maybe from the association of us all eating our bread lunch. One four-year-old child said: 'Maybe the birds did not have any bread?' One of the teachers said she believed it might be a bird flu, that it might be contagious among the birds. Then, another four-year-old child had another explanation: 'The birds might have eaten plastic, just like the whale.' (Excerpts from researcher's notes)

In these excerpts, we noticed a caring action from one of the girls; she picked a flower for one of the birds, but we let it go unnoticed because we wanted to avoid the children getting too close to the birds. What we can illustrate with this narrative, is nevertheless, that the group had different suggestions for explaining the death of the birds. An enquiry, was unfolded, where no one knew the answer to the disturbing scene with many dead birds in the landscape. While one of the children associated the dead birds with starvation, the teacher shared her belief that it must be a bird flu which had recently spread. It is interesting to notice the child who made an association with the plastic whale. The death of the whale that starved due to plastic in the digestive system, happened in 2017, the year the child was born. The child could not have known about the event of the dead whale at the time when it happened. In this area, as in many places in the world, the fact that we realize that animals die because of manmade lifestyles and actions, touches the emotions and, therefore, also memories (Wertsch & Roediger, 2008). We can anticipate that plastic waste has been a topic in the area both in homes and kindergartens. Moreover, media productions in the national broadcasting has for many years brought up issues of nature care and how plastic is destroying nature, is a knowledge known to many children through media, civic life, and education. The traces of emergent ocean literacy are in this narrative connected to the collaborative exploration of finding the reason for the deaths of the sea birds.

What is a tide?

We were at the beach in Spildepollen. The tide was high this day, and some of the children noticed the change of the tide and asked: 'Why is there so much water on the beach today?' One of the artists tried to explain: 'The water level changes

on a regular basis along the coasts of every ocean on Earth. We call it the tide. Today, it is high tide and later tonight it will be low tide; then we can see more of the beach. The water moves, you see.’ ‘But why so,’ the child asked, and the artist continued to explain: ‘The movement of the water between the rise and the fall of tides takes a long time; it is in a way dragged by the Moon and Sun. We cannot see the Moon and the Sun now because it is cloudy. The tides cycle as the Moon rotates around the Earth. We cannot feel it, but the Earth is constantly moving as the position of the Sun changes.’ The child did not respond to his explanation, and the teacher jumped in to explain more: ‘Yes, when we were here to clean the beach for plastic, it was low tide, I remember, then we could easily walk here and now the tide is high and the beach looks smaller.’ (Excerpts from researcher’s notes)

The above dialogue illustrates that the child had noticed the change of sea level and, through the conversation with the artist, the child learned the name of the phenomenon and received a lexical explanation. The child followed up once with a ‘why’, but it is difficult to say how much of the explanation the child understood. Space, distances, and what the Earth is, beyond where we stand, are difficult to grasp and requires imagination to do so. The teacher supported the explanation by referring to the concrete observable experience. This narrative illustrates a connection to emergent Ocean literacy by exploring the tides and the reasons for the tides. Even if such references to the real world and the laws of physics are hard to understand, such dialogues can illustrate that young children start to notice the facts of the real world by dwelling in the landscape (Ingold, 2010a). They can begin to understand space and how the landscape can seem permanent but is also shifting. The beach is there today as it was last week, but it has also changed. The world is changeable.

The children’s quest for facts

In the conversations and notes from the staff, it became evident that many children sought to know more about the landscape, marine life, and biotopes by the sea. The project had facilitated inspiration for the project by giving them a bookcase full of books. They could find a fine art book about ocean paintings, a book of marine facts, a book of maps, several picture books, and storybooks. As researchers, we did not observe the use of the bookcase, but some of the staff provided some notes to us and we had informal chats with children and staff when we participated in the field. The staff reported that the book of facts was popular, especially by a group of boys, and the children also liked the picture- and story books.

The staff also reported that the children asked for the names of items, shells, and phenomena they discovered in nature. As researchers, we also experience dialogues with some of the children about natural phenomena. We noticed that not all the children had this urge to know; we could see a pattern: Some children expressed a curiosity and took the initiative to ask and explore to understand, while other children were more withdrawn and silent, and it was difficult to state that they had an explorative behaviour.

Intergenerational engagement – experiencing a wave

The following excerpt from Eya’s field notes gives us a sense of an excursion. The community of older adults, repairing boats at the community boat house, had invited a group of children on a boat trip. Previously, the kindergarten children had been to the boat house to watch the older adults and repair old boats. They had also been to the local beach to sense the ocean and studied the world map. In this kindergarten, a huge world map cove wall, making it possible to delve into the details.

“Then, it was time for their turn to go on the boat. Tor, the community elder, led the way to the boat and the grandparents, children, and teachers followed. The teacher got on the boat first and Jarle helped each child one by one. One child called from the harbour: “Grandpa, come with me!” to which the grandpa responded: “I will, after you and your friends are on the boat.” Once seated and everybody was secured, Tor asked everyone if they were ready. “Yes!” and off they went. The small boat smoothly navigated out of the marina. “Oops, waves are coming!” said one of the grandmothers. Everybody turned and looked.



Figure 5, The big wave, photo by Eya Oropilla.

There was suddenly a big ferry nearby—its approach produced rocking waves. The waves were smaller at first, then grew bigger as it approached the small boat. Tod turned off the engine. It would be dangerous for the small boat to cruise fast on the rocking waves.

Everything and everyone were still but the small waves rocked the boat.

All of a sudden, a big wave smashed into the boat. The boat and the passengers jumped a little—the grandparents and adults had arms stretched over the children to ensure no one would fall over.



Figure 6, The big splash, photo by Eya Oropilla

“Splash!” No one could control the water—those who were sitting at the deck near the bow of the boat were splattered with water.

“I am wet! That was a big wave! Where did it come from?” exclaimed the child sitting by the bow.

“Yes you are, and that was exciting. The big ferry created the big waves that hit our boat,” said her grandfather.

“We had to stop so it would be safe?”

“We had to stop so the small boat will not turn over.”

“We have life vests on.”

“That was a good thing.”

After a few minutes, the small boat made its way out to sea again.

As the wind whipped through the boat ride, one child said “I am cold because I am wet!”

“Are you okay?” asked a teacher.

“Yes, I am, the Sun is shining so I will get dry soon.”

As the small boat moved along to the next adventure, the wet child sang and hummed the theme song of a pirate boat captain who has many adventures (Kaptein Sabeltann).” (excerpt from researcher’s notes)

This narrative, also captured in the video (screenshot above), elucidates an experiential excursion involving a diverse group of participants, including children, grandparents, teachers, and a community elder, embarking on a small boat voyage. As led by Tor, the community elder, the commencement of the journey underscores the importance of leadership and cultural tradition within maritime and sea activities, which he demonstrated to the other generations. The sequential boarding process, with the teacher assuming precedence followed by the children under the supervision of Tor, highlights a systematic adherence to safety protocols of going out to the sea, with explicit mention of the utilization of life vests. Subsequent encounters with passing vessels, such as the bigger ferry, prompted a collective recognition of the consequential effects of larger watercraft on smaller counterparts, specifically in the generation of waves posing potential hazards to stability and passenger safety. The dialogue among the adults and children, wherein the causative factors of the waves and the imperative cessation of forward motion for safety are elucidated, engendering an environment conducive to enquiry and comprehension of oceanic phenomena. In addition, the group's resilience in the face of adversity, characterized by their unwavering determination to persist despite discomfort induced by waves and resultant dampness, signifies adaptability to adverse conditions inherent to maritime and ocean activities. It was an opportunity for

intergenerational learning between and across different generations including early childhood institutions (Oropilla, 2021; 2023) brought on by experiencing the environment and its effects on humans. In having intergenerational engagements by the sea, there is knowledge transfer across generations, which is an important aspect of intergenerational learning and could be considered thinking differently and innovatively, which Norwegian kindergarten teachers have identified as necessary to have more intergenerational engagements between and across institutions (Oropilla, Ødegaard & Quinones, 2022).

Moreover, the incorporation of cultural references, such as the thematic song of a pirate boat captain, adds a dimension of cultural enrichment and imaginative stimulation, potentially fostering deeper engagement and appreciation for local nautical heritage and folklore. There was also an appreciation of global strengths important in understanding intergenerational engagements and learning (Oropilla and Ødegaard, 2021). All in all, this narrative epitomizes an experiential and culturally contextualized approach to ocean literacy, wherein aspects of Learning by Observing and Pitching In (LOPI) (Rogoff, 2014) are apparent as participants of different generations are afforded opportunities for hands-on learning, observation, and discourse, thereby fostering a holistic understanding of the oceanic environment within a cultural framework.

Intergenerational engagement – exploring the fish

Figure 7, The fish net, photo by a child from Klokkarvik barnehage



“Finally, it was time to collect the fish from the fish trap. In the other rounds, Tor drove up to the marker and pulled the rope until the trap was on board. This time, it was one of the grandfathers who pulled the trap on board. He pulled and pulled and pulled. “There’s a crab!” exclaimed one child. “It is big! I will take a photo!” said the other. “Can I touch it?” said another child. The grandfather explained, “I need to get the other fish out first.” There were other fish that got trapped. “Here is a small fish so I shall throw it back in the water,” said the grandfather. The children watched. “These ones are bigger and can be used for our soup.” He placed it in a bucket with water. “There are some twigs in the trap too, but it is good that there is no rubbish.” “The whale had plastic in its belly.” “Yes, that was sad that there was plastic and whale at it. These fish sometimes swim with the plastic thrown into the water.” The crab made a sudden movement. “Oh! Can I touch the crab now?” The grandfather replied, “I think it is best to keep him in the net for now. He has strong legs and pincers that might hurt us if we try to hold him now. We will take him with us when we get back to the harbour.” “Yes, then it will hurt if he bites me.” Tor said, “Time to go back to land!” By the harbour, one of the teachers showed the children the process of cleaning and preparing the fish for cooking soup. “We pull out the innards of the fish and remove the scales too before we can eat them.” The children exclaimed, “There’s blood!” “Let me see!” One child noticed, “the seagulls are watching us.” “Yes, there are four seagulls,” one child also responded. “What are we going to do with the innards?” “We can place it back in the sea as food for the other animals.” The teacher threw the innards into the sea. “Here comes the seagulls!” one of the grandparents said. They watched as the innards and blood were swept away by the gentle waves in the harbour.” (Excerpt from Eya’s notes)

This excerpt illustrates an exploration centred on the collection and processing of fish from a fish trap, fostering emergent ocean literacy among participants. The engagement begins with the retrieval of the trap, with various individuals, particularly the older persons, taking turns in the process, thereby instilling a sense of collective responsibility and participation. As the trap is brought on board, the discovery of trapped marine life, including a crab, prompts curiosity and enquiry among the children, facilitated by the grandfather’s informative explanations. The grandfather’s decision to release smaller fish back into the water underscores a commitment to sustainable fishing practices and environmental stewardship, while the acknowledgement of the absence of marine debris within the trap fosters awareness of marine pollution issues. Furthermore, discussions surrounding the unfortunate encounter of a whale with plastic waste in the same local landscape highlight the interconnectedness between human activities and marine ecosystems, emphasizing the importance of conservation efforts. The cautious approach to handling the crab, considering its potential to cause harm, exemplifies a prioritization of safety and respect for marine life. Subsequently, the return to land provides an opportunity for hands-on learning as a teacher demonstrates the process of cleaning and preparing fish for consumption, thereby connecting theoretical knowledge with practical skills. Moreover, observations of seagulls scavenging for discarded fish innards underscore the concept of marine food webs and the role of various organisms within coastal ecosystems. The decision to return fish innards to the sea as food for other animals reinforces the ecological principles of nutrient cycling and waste management. Once again, Rogoff’s (2014) LOPI aspects exemplify an intergenerational approach to ocean literacy, encompassing ecological, environmental, and ethical dimensions while encouraging active engagement, critical thinking, and appreciation for marine biodiversity and conservation. It was also a welcome opportunity heeding the call for more intentional intergenerational engagements and programmes between young children and older adults (Oropilla & Ødegaard, 2021) and the use of local knowledges and experiences (Oropilla and Guadana, 2021).

Chapter 5 - Sensing the Ocean: Exploring and developing art workshops for children on the topic of ocean life

In this chapter, we present a workshop methodology, developed through two explorative, open arts, and science workshop for children. Here, we will present the workshop design, for the kindergarten staff reader to be inspired to try it out. We held the workshop twice. Seventy children participated. First, we had an open invitation to local kindergartens in the local area of our university. These workshops were held in the library as part of the programme for Forskningsdagene (Research Days) in Bergen, autumn 2022 and later as part of the programme of One Ocean Week, in Bergen, 2023. The drawings and

media-creation are not included as research data but considered as project dissemination and outreach to the general public and especially tailored for children in early years educational settings and families. These workshops were designed with an inspiration from the theoretical idea of Collaborative Exploration (Ødegaard, 2020, 2021a, 2021b) and further designed and developed by artist Håkon Hoffart. The workshops were carried through and facilitated with a team of Elin Eriksen Ødegaard, Åsta Birkeland, and master students; Andrine Kongshaug and Janne Torsvik.

What is Havsans (Ocean Sense)?

The following text is written in a design genre (written by Håkon Hoffart and Elin Eriksen Ødegaard). It is also available in the Norwegian language as a resource for kindergarten.

This is an event for children to explore in their encounter with the blue planet and life in the ocean. We explore and draw together. Here, we use colour pencils, paper, and a large display. We play with our drawings and create our own digital aquarium.

The workshop is tied to the kindergarten's framework plan through its subject areas *Nature, technology, and the environment as well as Art, culture, creativity, and co-creation*. The goals of the workshop are:

To help children get to know and understand life in the ocean, bring them joy, community, and achievement through participation in a joint activity that alternates between using their own senses, their imagination, and exploring the creativity of others, cooperating with others, and creating something new and communal together. *Our workshop is anchored in the Sustainable Development Goal nos. 4, 14, and 17.*

Short summary:

1. We bring sensory experiences.
2. We look at photographs and talk together.
3. Everyone makes pictures of sea life.
4. We then give the drawings a new context — our own aquarium/ocean.

Materials:

For the children: Sheets of paper and drawing materials.
For the mediator: Digital image processing opportunities with an HDMI connection to a projector.

(Note that you could potentially run this entire programme using only scissors, glue, and collage. We describe the digital method here.)

Preparations for the kindergarten:

Provide adapted sensory experiences related to the theme of *One Ocean*. As a foundation, use local options for things the children can touch, listen to, smell, see, move around in, and things they can have a sense of exploration about. Frame the activity and engagement with the central theme of sustainability and the sub-theme: Life in the ocean.

Preparations for workshop mediator:

- Set the stage in the room for the workshop:
Plan how the start-up, implementation, and ending of the workshop will be conducted.
- Create a simple visual representation of life in the ocean, e.g. of deep-sea animals (7-20 images).
- Prepare a computer/projector.

Kindergarten:

Prepare sensory experiences for children that are adapted for the site and their level of development. There are many options here, but the most important thing for the children may be to give them opportunities to explore by feeling/touching, smelling, tasting, seeing, listening to, and moving around in.

Mediator for the workshop:

Before the workshop starts, it will be a good idea to frame the room. The workshop can be conducted at a table, but it may be a good idea to let the room have a few options in case any of the children need a break during the workshop. The room can be set up as a course where the children are provided with sensory experiences on their way into the workshop. The workshop must be staged by the mediator to be clear, inviting, and engaging. A dialectical style, where children are invited to participate and are met with a supportive, playful, and expansive style. The mediator creates a visual representation of life in the ocean, e.g. deep-sea animals in the ocean. (For example, search for “weird deep-sea creatures”, “unusual sea animals”, etc., and but steer clear of the scariest ones).

The mediator uses image processing software (Photoshop or the free software GIMP, or equivalent software on tablet). Find an ocean background (for example, search for “desktop wallpaper underwater” and pick a background where we only see water/the ocean floor without any animals). Feel free to increase the resolution of the image so that there is more room to work on it later.

On the day:

Part 1

Invite the children to the workshop:

Make sure you have a cohesive group of children and good helpers who know them. Meet the children with a present and engaging style. Ensure that your good helpers understand what will be happening so that you are all on the same page.

Look at pictures together

When the children are ready, the projector will show their selected ocean picture. We will open by looking at pictures of life in the ocean: Deep-water creatures that look completely different from what we have seen before.

This is a suitable method for children and adults to shed their preconceptions about what lives in the ocean. It lets us see that the ocean is home to far more than we imagine, sharing a sense of wonder about it. What does this fish use its “lantern” for? Why are the deep-sea fish transparent? Questions like this are good for getting up close to the animals — immersing ourselves in what it means to live down there.

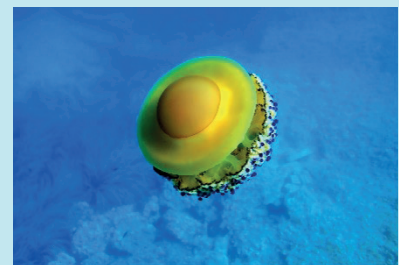


Figure 8, Deep sea creatures, photo with permission to republish by Laurence Madlin/Getty Images/Laurence Madlin/Popular Mechanics.

Please note: The starting point for such an intro is the mediator's own fascination with the images they find. This means the joy of sharing, which in turn serves as a source of inspiration.

Summary of Part 1:

- The mediator puts together a slideshow with 20 images of “unexpected” marine creatures.
- Tell some short anecdotes about some of them (optional).
- Invite a shared sense of wonder.

We have now dispelled the notion that the ocean is only home to the “classics” like fish, sea urchins, and plankton. We see that there are creative “imaginary creatures” down there that do not even follow the geometric shapes/symmetry we are used to. This is a fantastic starting point for understanding that our own free imagination may not be that different from what nature creates. There are two reasonable goals behind this acknowledgement:

- “No holds barred” for wonder and creativity.
- We feel a different kind of closeness with nature — we become allied to it.

Time management: Note the group’s attention span. Looking at images can mean anything from 15 minutes to just 2 minutes. It must be possible to skip forward to the drawing section whenever the mediator feels it is appropriate to do so.

Part 2

We get our sheets of paper and drawing materials!

Now, everyone gets to draw and develop new life forms in the ocean. There are no guidelines here, and the adults also make their own drawings. Exercise caution when making categorical statements about the children’s drawings — avoid leading questions about their drawings. Either way, you should focus on your own drawing.

Once the children have finished a drawing, they *hand in their drawing* at a specific place. This could be a mailbox or perhaps a “cave” under a table where a speaker is playing water noises. Feel free to come up with something that could make the spot a little mysterious.

Part 3

Live projection of image processing

The mediator scans the drawings. The images can also be copied by simply taking mobile phone pictures of the drawings in good daylight, then sending the images to a computer by e-mail, cloud storage, or directly transferring them.

Put the drawing into the software and remove the background so that the child’s drawing (e.g. a fish) becomes a separate layer with a transparent background. This drawing can now be placed in the ocean background we have prepared. This is often fun for the children. The mediator can move the fish around the background, as though it were swimming. We can change the colour of the fish (command+U in Photoshop) and ask the person who drew the picture what colour the fish should have.

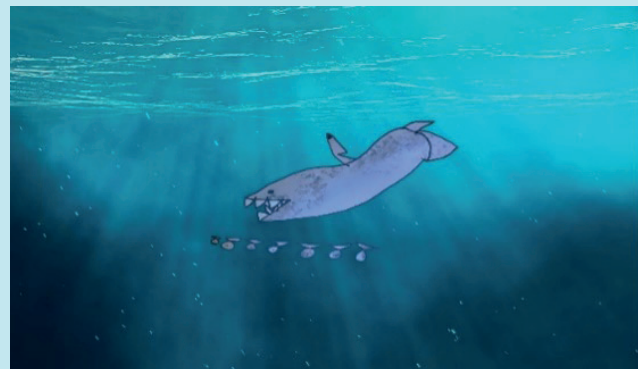


Figure 9, Shark with baby sharks, Illustration made by children and Håkon Hoffart

Try to release the first fish drawing into our “ocean” as quickly as possible so that the children understand that the other drawings will also be included.

Remember that the more abstract drawings made by younger children can be included as well, even if we don’t know what they represent. The mediator has some freedom to cut shapes from the abstract drawings.

Please note: The mediator will often be busy enough with their own task here, so it would be beneficial if some others (good helpers) can offload some of their work by answering questions and comments from the children during the workshop. It would also be good to have a dedicated person scanning/taking pictures of the drawings that are to be used.



Figure 10, Aquarium, illustrations made by children and Håkon Hoffart

Aquarium illustration made by three kindergartens in co-creation with Håkon Hoffart. Shared ownership was a premise for participating.



When the ocean is going:

Now that we have our own aquarium on the screen/projection, we have found that many children get excited about making new drawings to be included as part of the ocean. Most will be fascinated, but not all. If you have the resources for it, it would be great if the room has other “stations” the children can stop by. For example:

- A tub with seaweed to touch.
- A reading station with books about fish and the ocean.
- A cave under a table with a sheet over it where they can watch videos from underwater.

When they later come back to the drawing spot, our “ocean” will have been populated by more animals from the artists. This way, the workshop takes into account that a group of children will have a range of different needs, aptitudes, and interests. Flexible and cooperating adults help contribute to make the activity a positive and educational experience, awakening or expanding a curiosity about life underwater.

Conclusion:

All the children are called in again so we can look at the ocean we have created together and have a group conversation. Be open to what might come up in the dialogue. We give the workshop a clear conclusion. This could mean giving everyone a round of applause.

Chapter 6 - Disruptions and how we handled them

The pilot gave valuable experiences on how to best tailor the project to the local landscapes, the culture and rules of kindergartens, and how to collaborate across disciplines and professions. We also learned that a project with a vision of a more sustainable future quickly brings a range of dilemmas. This chapter will explore the question:

What are the critical lessons learned from a collaborative project with diverse stakeholders? We present four disruptions and how we handled them.

Arts approaches and age-appropriate pedagogical approaches

Despite staff reports of the project giving them valuable and inspiring experience, acknowledging the uniqueness of the project aesthetics and poetic approach, the staff critiqued that the project had aspects that were difficult for children to grasp, e.g. the metaphorical aspects of the map that the children played with, imagining events, cutting it in pieces, using ocean water to soak the paper, to create a new canvas for the children's ocean portraits. They also reported that using pencils and scissors was difficult for the four-year-olds.

The Ocean Portrait project had the qualities of an art project in the category of performance arts with an abstract idea. The artists and researchers designed the arts/research project poetically and metaphorically. The argument for this was that, even if the children did not fully understand it academically, experiencing it was enough. Hopefully, the children would get some ideas from participating in a joint poetic journey. We thought that, on this journey, the children would see, smell, touch, and listen; they would have been afforded the possibility to sense a sea landscape. The dialogues between the adults at the site and the children could vary. Typically, the project inspired dialogues responding to children's movements towards a natural object, sometimes co-exploring with children and sometimes, naming marine knowledge. There would also be instruction sequences, especially when using tools and telling children about the procedures for craftmaking (the making of the ocean portrait).

For the artists, it was important to distinguish between the ocean portrait and its art practice and the pedagogical

explorative approach framed and practised by the participant researchers and the staff. The artists articulated this tension several times; they highlighted the importance of letting the art events remain unprocessed. Nevertheless, the art project proceeded with dialogues and instruction. This tension between the need to communicate and lead the art process, maintain the experience, and keep it open ended was ambiguous.

The researchers raised the question of whether an art project is an art project alone, when it is conducted within the framework of an educational institution, or when it is made in collaboration with researchers. Interdisciplinary collaboration could be difficult because it is more complex to organize and implies spaces for negotiation when tensions and problems occur during the research process. These negotiation processes can be seen as political and will need a high level of reflexivity to make these processes visible and transparent (Chairns, et al., 2020). The tensions in our project are similar to those found in an evaluation of artists visiting schools (Oxford Research, 2023). They found that, if the arts should function well within educational settings, artists need to collaborate closely with teachers who know the children's growth and development and the pedagogical leadership of groups. They also ask if artists in pedagogical settings believe too much in art for art's own sake and too little in the receiver of the art.

In our project, we could also encounter these kinds of discussions, which show that the borderline between pedagogy and the arts can be blurred. Tension can occur when the identity of being an artist as free from pedagogy becomes too strong. Still, educational settings are spaces for artists to earn their salaries, and teachers might leave the performance to the artists themselves if the design alone belongs to the artists.

A challenge for art programmes in schools is the engagement and participation of teachers. Artists take the lead. This research explains this as, on the one hand, a need for more teacher competence in aesthetic practices and, on the other hand, that artists take the defining power of what art is and how it should be conducted. Teachers' knowledge about the children, curriculum, and aesthetic practices are on the sidelines (Oxford Research, 2023).

In this project, we were aware of this as a possible tension; therefore, we (the artists and the researchers) carefully planned with the teachers to agree on a participating role for every participant. The project also held numerous meetings, some to discuss tensions and problems to find solutions and try to repair strong emotions among participants.

In our project, we noticed the same kind of teacher-reluctant practices reported in the study hereinabove. However, we could also observe the staff, master students, and researchers practising responsive pedagogy, following the child's lead, and entering a dialogue after a child's initiative when the children were actively explorative. A few children were reluctant to be on the sea landscape site. Here, we could observe that the staff guided the children, made them aware of what was happening, took their hands, and walked alongside them, ensuring they participated in the project.

Oppositional view on nature; nature for human pleasure or for preservation

An incident occurred on the last day of the project. That day, we had planned to have an exhibition on the beach. Families and the whole kindergarten were invited, food was prepared, and banners for the children's ocean portraits were ready. When the artists, film crew, head of the kindergarten, and some of the researchers came to the beach that morning, it was very shocking to find the beach destroyed. An excavator was at the site and had been used to dig the natural biotope of the beach. The stones, with all the seaweed, were left on one side of the beach.

Later that day, we learned that the local community had agreed to transform the natural beach into a beach with soft white sand without stones and seaweed. This discovery was very upsetting to our project participants, as their views were very much in favour of ideas of nature preservation. The project participants agreed on the idea of protecting the environment from harmful human activities. What was happening here was perceived as the opposite, to destroy a natural biotope and replace it with a dead one. Emotionally, the participants explained their feelings as anger, grief, and loss, and they called the critical event a disruption and a criminal offence towards a natural habitat. The participants were so emotionally struck that some immediately searched for laws, only to discover that Norwegian laws only advised to let nature be and was open to local municipalities giving exceptions.

The participants experienced an immediate dilemma: What about the exhibition? The site was transformed into a mudhole, and it would have been impossible to continue the exhibition here. Should we cancel? Or should we find another site for the exhibition? Should we explain all the reasons to the children and families or should we just carry through with our arrangements in a good spirit and let the shock from the morning pass?

We landed on swallowing the grief and anger and making sure to make the exhibition for the children a happy and proud event and memory. The exhibition took place in an afternoon in a heather area outside the kindergarten. The children took part in setting up the exhibition of the ocean portraits, and when the family entered the heather in the afternoon, the children's ocean portraits on the self-crafted papers swayed in the wind on the banners designed by the artists. The banner had symbolic prints of a whale skeleton and a world map. The banners with the painting gave an amazing impression.

The dilemma, however, was not solved that day, as more complexity was added to the case. After negotiations, we decided to include the critical event in the documentary film and in our report.

Doing explorative practices and documenting at the same time

As researchers, we intended to follow a sensitive way of participating with the children, staff, artists, and filmmakers. We documented the events and workshops in all kindergartens with various filmmakers (Hoffart, Goia, and Guadana). We had preparation meetings with all to ensure we followed the same, going alongside the approach to research and document the processes. Still, there were incidents, especially connected to the filmmaker's technical and artistic demands of camera angles and getting the sound clear, where the artists felt the filmmaker disturbed the process of exploring with children. This was also an example of how interdisciplinary teams, on the one hand, can be excellent as a manifold of knowledge can contribute to the development of an exemplary process and, on the other hand, at the same time, can produce conflicts of interest.

How did the staff follow up on the project in between and after sessions?

The staff could report that many of the children, in between sessions, were interested in the ocean theme, but very often, with an encyclopaedia approach.

They asked for names and facts about the ocean and the species. We found this interesting, as our project anticipated that children were innately explorative; we could also see that many were curious about factual knowledge researchers noticed that they were given short factual answers from the staff. We also noticed dialogue between the staff and children at the scene where the staff would be engaged in children's activities in responsive ways. Still, the language used to describe the biotope in an aesthetic language was limited. The most elaborate and deep conversation with children was observed between the artist and the children, between the master students and the children as well as between the researchers and the children. The project cannot answer why the staff was only limited engaged in the explorative dialogues with the children.

We were interested in whether deep and elaborate dialogues would occur between the staff and the children after the project. Therefore, a master student studied whether the project's emphasis on explorative dialogues could be observed after the project. She asked whether the project had any impact on the practices (For further reading, see Torsvik, 2024).

Chapter 7 - Summing up the findings

We began this report by highlighting a concern with the current direction of ocean literacy. This chapter will discuss our findings according to the following questions: What characterizes children's emergent ocean literacies? How can they be enriched? What lessons can be learned from a collaborative project with diverse stakeholders?

Children's emergent ocean literacies

As pointed out hereinabove, previous meta-studies on literacy have found six essential literacy approaches that have proved vital for the development of emergent literacy (Cooper, 2005). These six approaches do not consider a holistic approach where children's imaginary play, exploration, and movements, learning using art from and in the landscape, are included.

Based on our findings, we suggest expanding these literacy approaches to include artistic literacies and a more specific ocean literacy that implies movement and observation across landscapes. The following table summarizes previous research and includes our expansion. With the following 13 approaches, we propose that the concept of *emergent ocean literacy* should consider that children move, sense, explore, and imagine with their whole bodies.



	Skills and capabilities	Existing and new contributions
1	Oral language: expression, home language, syntax, vocabulary, and sentences	Literacy skills for reading and writing (Cooper, 2005). A language perspective
2	Narrative form: knowledge of how stories work, where stories come from, what stories are composed of, sequencing, plot development, characterization, writing process, authorial intention, and use of imagination patterns	
3	Conventions of print: knowledge of how print functions, including directionality, spaces between words, letters, words, and punctuation	
4	Code: encoding and decoding	
5	Word study: sight words, phonics, spelling, and decoding	
6	Reading for meaning	
7	Knowing global sea's relationship with all world systems and society's influence upon that sea and understanding the ocean and its importance and the common responsibility we have towards the seas, oceans, and resources.	Ocean literacy (Chang et al., 2021) A marine perspective
8	Global awareness and active citizenship for ocean issues, including school children and across generations and among local communities.	Ocean literacy Blue School approach (Koutsopoulos & Stel, 2021)
9	Children learn particular ways of being, living, and knowing. This is captured by the notion literacies of the sea and reflect an 'embodied sense of place, pointing to the significance of nature, materiality, and interaction with the sea'	Literacies of the sea (Kjørholt, 2023)
10	Trust in own agency and emotions to sense and experience the landscapes and weather worlds and articulate uneasiness.	Literacy capabilities for Emergent ocean literacy A cultural/bodily/natural/relational/ecological: (holistic) perspective
11	Trust in own imaginary play and to explore on own premises as well as together with others.	
12	Landscape enquiry: sensing and exploring the landscape while walking and observing details in nature, wide scope in nature scenery.	
13	Beginning to understand and conceptualize the connections between the local and the global and understanding signs and shape representation on maps.	

Table 3. Literacy skills and capabilities relevant to holistic educational approaches to young children

Table 3 presents previous research on emergent literacies and our proposed additional approach to widening the concept of Ocean literacy and similar concepts (Literacies of the Sea). *Emergent ocean literacies* are age appropriate and suitable for education for sustainable development to early childhood education. We propose that *emergent ocean literacy* should incorporate sensory experiences in local sea landscapes, geographical and bodily understandings of landscapes, emergent knowledge of the biotopes and ecologies where land and sea meet, and expressions connected to these literacies. The study led us to the following definition of *emergent ocean literacy*; *sensory and imaginary experiences in local sea and ocean landscapes; cultural, geographical, and bodily understandings of landscapes; emergent knowledge of the biotopes and ecologies where land and sea meet; stories of the coastal land and lives of the ocean; and human expression connected to these literacies.*

For this project, the ocean landscapes were central because we walked, sensed, explored, experienced, and expressed the landscape and, at the same time, we held a relational approach to children and nature. Therefore, we needed theoretical underpinnings to support these movements and processes. Early childhood education is not a matter of transmission; rather, it is a matter of paying attention to the world in which we live. While transmission shuts out life, paying attention to life includes listening to meaning, being present, and getting along with others by caring for people, things, and nonhuman conditions.

Enriching children's emergent ocean literacies

This project contributes practical relevance to the current knowledge and discussion on ocean education by weaving in various narrative accounts of how the teachers, researchers, and artists planned for the children's ocean explorations and how the activities, local ocean landscape, and collaborative pedagogical engagement afforded dynamic opportunities for action and emergent ocean literacies to be nurtured and start to unfold. The ocean portraits were unique because they had sensory qualities such as colour, tone, texture, and brush strokes. The work was done as a collaborative exploration in dialogue where the semantic and symbolic qualities of the expressions mattered. We found that this approach enriched the children's opportunities to move, sense, explore, imagine, and feel the coastal landscape as well as the biotope between the land and sea.

Based on the ethnographic narratives and previous research on literacy and ocean literacy, we have explored the possibilities of working with children and staff in kindergartens in marine milieus through a collaborative arts and pedagogy project.



Figure 11, Children's Ocean portraits, photos by Åsta Birkeland

The project provided children with a collaborative approach to sense, explore, and express the biotope where the land and the sea meets. The enquiry uncovered how children engage with the project's ideas. As envisioned by Arne Næss (Jickling, 2000), the project allowed the children to move between naming and explaining the world and playing along with the imaginary world in dialogical loops with it. This pedagogical approach enriched their explorative and expressive engagement. We noticed deep concentration, explorations, and ongoing dialogues.

The project provides narrative insights into some of the events and dialogues. The children created the artwork, but the artists and staff inspired them multiple times, and the artists guided the artistic process carefully.

A crucial condition for children's exploration was staff participating in the activities, not as passive observers of children's exploration, but rather as exploring and curious human beings. With a dialogic engagement, the exploration was a collaborative activity (Ødegaard, 2020). This does not imply that the teachers, artists, or researchers overthrow the explorative activities. Still, the teachers, artist, and researchers had a designating function, pointing to interesting aspects and opening the world for the children. This is an important position in between when discussing whether children should initiate activities or the teachers. We experienced that the children's questions and the teachers' designating role could give direction to the exploration. However, to cultivate such a dialogic engagement will demand teachers who feel free to explore, play, and being innovative.

Another important condition for enriching children's emergent ocean literacy was to be flexible in the aims, intentions, and direction for the activities. This approach contradicted a rigid predestination of goals and intentions. The project had a clear direction by exploring the biotope ocean-land and did not deviate from this direction by every spontaneous suggestion to change direction. Still, things happened that led to new goals and intentions. For instance, when the children discovered all the dead birds, lots of questions arose and the staff chose to follow up on these questions. The staff had a readiness for emergent planning which cannot be mixed with random planning (Ødegaard & Birkeland, 2023). This kind of planning is closer to an artist's approach who allows intentions and goals to develop from the concrete actions itself. According to Elliot Eisner, the teacher acts like an artist when children participate in rich art experiences and when the teacher creates a climate for exploration, risk taking, and cultivates the disposition for play (Eisner, 1994, s. 160).

Another crucial condition for enriching children's emergent ocean literacy is that staff follow up on the children's questions and curiosity. Although limited and short, we found some examples of enquiries into poetic expressions, wondering together with children making co-narratives, adding natural science facts, clarifying concepts, looking at shapes and colours, and following children's movements by the sea. In these few examples, the staff extended the children's experiences, feelings, and understanding of the world.

We encourage leaders in early childhood education to identify examples of extended engagements between children and staff to nourish the educational culture to be enriched by explorative dialogues.

Lessons learned from a collaborative art, education, and research project

Dilemmas in the project: The One Ocean Exploration project is an example of how a project can expand into unforeseen directions and content. Employing different stakeholders gave new opportunities, but also more work and less possibility to have an overview of all the processes involved. With more stakeholders, a diversity of questions arose. Who is the owner of the project? Who is in charge of the different parts of the project? Who decides the narratives of the project? What is the main project and what are the subprojects? We experienced that it was difficult to have enough time to clarify all these questions. In addition, some of the dilemmas were more subtle. Different stakeholders had different aims with the project. As an explorative art, pedagogic, and research project, it mirrored different agendas for the stakeholders.

List of disseminations from the project

Videos and visual materials

Hoffart, H. (2022). One Ocean Sea portrait. One Ocean - Ocean Portrait - One Ocean - Havportrett - YouTube

Goia, F. (2022). HAVPORTRETT TRAILER ENGLISH SUBTITLES 2 - YouTube

Goia, F., Ødegaard, E. E. & Havre, S. J. (2023). Havportrett - Barna ved Nordsjøen [Ocean Portrait - Children by the North Sea]. Awardwinning Documentary Film. 'The best Educational Concept where film is used'. Award at Tromsø International Educational Film Festival March 2024. Shown: Bergen, Ocean Week, 2023, Jubileum HVL, 2023, Tromsø International Educational Film festival, 2024, Shanghai, 2024.

Oropilla, C. T & Guadana, J. (2023). Havfortellinger i generasjonsmøter: Intergenerational co-creations in the local community of Klokkarvik.

Articles

Ødegaard, E.E.; & Birkeland, Å.; Marandon, A.; Marandon, A.; Spilde, E.; Ingebrigtsen, A. K. (2023). Hvorfor har vi bølger i havet? Barnehagefolk 2/2023.

Ødegaard, E. E.; Birkeland, Å. (in process). Emergent ocean literacy in early childhood education - broadening the concept and applied impact of ocean literacies for new generations.

Oropilla, C.T. & Ødegaard, E.E. (in process). Intergenerational Co-Creations by the Sea: Enriching Early Childhood Education.

Master thesis

Gustavsen, M. (2023). Children's explorations by the sea - a gender perspective. Master i Barnehagekunnskap, HVL.

Ingebrigtsen, A. K. (2024). Waves - children's creative exploration of waves. Bølger - om barns skapende utforskning med bølger ved havet. Master i barnehagekunnskap, HVL.

Torsvik, J. Å. (2024). Utforskning etter kunstprosjekt ved Havet. Master i barnehagekunnskap, HVL.

Keynotes and papers at scientific conferences

Ødegaard, E. E. (2023). Collaborative Exploration - A signature pedagogy for the Early Years. Keynote at China - Norway Sharing Seminar on Societal Sustainable Development. Webinar Series 2. Early Childhood Education Practices in China and Norway. Arr. Center for International Knowledge on Development, Beijing and The Norwegian Embessey, Beijing, China.

Ødegaard, E. E. & Birkeland, Å. (2023). Emergent Ocean Literacy - Collaborative exploration of local ocean landscapes in early childhood. Sustaining, knowing, and 'living' the Blue. NTNU, Trondheim.

Ødegaard, E. E. & Birkeland, Å. (in progress). Emergent ocean literacy in early childhood education - broadening the concept and applied impact of ocean literacies for new generations. Children's Geographies.

Ødegaard, E. E. & Oropilla, C. T. (2023). Sustaining, knowing and 'living' the Blue. NTNU, Trondheim. Sustaining Stories of the Seas: Intergenerational collaborative narratives enriching early childhood education

Ødegaard, m.fl. (2023). Havportrett - Barna fra Nordsjøen. Sustaining, knowing and 'living' the Blue. NTNU, Trondheim.

Ødegaard, E. E.; Birkeland, Å. (2022). Emergent Ocean Literacy - a collaborative exploration of local ocean landscapes in early childhood education. Klimafestivalen - varmere, våtere, villere; 2022-03-11 - 2022-03-11

Ødegaard, E. E. (2022). One Ocean explorations - children's imaginations crossing borders. CHACDOC conference

Ødegaard, E. E. Hu, A., Oropilla, C. T., Gustavsen, M., Torsvik, J. & Ingebrigtsen, A. (2023). One Ocean- Exploration. Barnehageforskningskonferansen, Stavanger, Oktober, 2023.

Panels, workshops and chronicle for the general public

Ødegaard, E. E. (2023). De yngste barnas stemme i klimadebatten. One Ocean Future på Statsraad Lehmkuhl. Arrangement Akvariet i Bergen.

Ødegaard, E. E. (2023). Utdanning om livet under vann starter i barnehagen. Chronicle in Barnehagen.no.

Ødegaard, E. E.; Birkeland, Å.; Hoffart, H. (2022). Havsans - et forskningsbasert sanseverksted om hav for barnehagebarn. [Kunstnerisk og museal presentasjon] Forskningsdagene. BARNkunne - Senter for barnehageforskning; Biblioteket - Høgskulen på Vestlandet.

Hoffart, H.; Ødegaard, E. E.; Birkeland, Å.; Gustavsen, M. (2023). Havsans - Akvariet junior. [Kunstnerisk og museal presentasjon] Akvariet Junior. Akvariet i Bergen; Bergen. 2023-04-18 - 2023-04-18.

Oropilla, C. T. (2024). Om jeg hadde en tryllestav, - hva ville jeg da forandre i verden? Varmere, Våtere, Villere, Klimaparken Junior [Clima Park Junior]. 16 mars. Marinehallen.

Ødegaard, E. E.; Reite, H.J. Oropilla, C. T., Aadland, E., Wergedahl, H., Torsvik, J., Ingebrigtsen, A. & Sælensminde, J. (2024). Bor det Monstre i Havet - Fortellinger mellom generasjoner og forskere. Havuken Bergen [One Ocean Week], Storstuen Skoltegrunnskaiaen, 15 april, 2024.

Ethical declarations

The data contained in this article were approved by the ombudsman for ethics at Western Norway University, first on 12/05/2021, Number 530501, and again after an extension, on 21/12/2022, Number 655592. The research study title for ethical approval was: Exploration and cultural formation.

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The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial data. This includes not only sales and purchases but also expenses and income. The document provides a detailed list of items that should be tracked, such as inventory levels, supplier payments, and customer orders. It also outlines the procedures for recording these transactions, including the use of standardized forms and the importance of double-checking entries for accuracy.

The second part of the document focuses on the analysis of the recorded data. It describes various methods for identifying trends and anomalies in the financial records. This includes comparing current performance with historical data and industry benchmarks. The document also discusses the importance of regular audits to detect and correct any errors or discrepancies. It provides a step-by-step guide for conducting an audit, from the selection of samples to the final reporting of findings. The goal is to ensure that the financial records are reliable and provide a clear picture of the organization's financial health.

The final part of the document discusses the implications of the financial data for decision-making. It explains how the information can be used to identify areas for improvement and to develop strategies for growth. The document also discusses the importance of transparency and communication in financial reporting. It provides a template for a financial report and outlines the key elements that should be included, such as a summary of the findings, a list of recommendations, and a plan of action. The document concludes by emphasizing the role of accurate financial records in the success of any organization.



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