



Reconfiguring Environmental Sustainability in Early Childhood Education

a Post-anthropocentric Approach

Kassahun Weldemariam



UNIVERSITY OF
GOTHENBURG

Reconfiguring Environmental Sustainability in Early Childhood Education

Reconfiguring Environmental
Sustainability in Early Childhood
Education:
A Post-anthropocentric Approach

Kassahun Weldemariam



UNIVERSITY OF GOTHENBURG
ACTA UNIVERSITATIS GOTHOBURGENSIS

© KASSAHUN WELDEMARIAM, 2020
ISBN 978-91-7963-022-5 (printed)
ISBN 978-91-7963-023-2 (pdf)
ISSN 0436-1121

Academic thesis in Educational Science at the Department of Pedagogical,
Curricular and Professional Studies, University of Gothenburg

The publication is also available in full text at:
<http://hdl.handle.net/2077/63258>

Subscriptions to the series and orders for individual copies sent to: Acta
Universitatis Gothoburgensis, PO Box 222, SE-405 30 Göteborg, Sweden or
to acta@ub.gu.se

Cover image by Margaretha Häggström. The dandelions finding their way through the cracks symbolises the beauty, power and determination of nature. They also connects with the weather as its seeds are spread by the wind. Dandelions also produce affect, for instance, when children blow its seeds into the air like parachutes. Bees love dandelions and they are believed to be an early nutrition source in spring. Lastly, the striking yellow represents the colour that the Ethiopian and Swedish flag have in common and as such unites the two countries that have affected me most as a human being.

Photographer: Gunnar Jönsson

Print: Stema Specialtryck AB, Borås, Sweden, 2020



Abstract

Title: Reconfiguring Environmental Sustainability in Early Childhood Education: a Post-anthropocentric Approach
Author: Kassahun Weldemariam
Language: English
ISBN: 978-91-7963-022-5(printed)
ISBN: 978-91-7963-023-2(pdf)
ISSN: 0436-1121
Keywords: Sustainability, Anthropocentric, Post-anthropocentric, Assemblage, Subjectivity, Affect, Ontology, Epistemology, Agency, Becoming-With, Distributed Agency, Materiality

The purpose of this dissertation is twofold. First, it explores how the notion of sustainability is conceptualized within early childhood education discourses and how it is manifested in early childhood curricula. Second, the dissertation examines post-anthropocentric possibilities of sustainability within early childhood education.

A major finding of the two studies, relating to the first purpose, is that early childhood education tends to have an anthropocentric bias and over-emphasizes the importance of children's agency in enhancing their potential to contribute to sustainability. Using this finding as a backdrop, the major finding of the two subsequent studies, relating to the second purpose, is that post-anthropocentric analysis can help to challenge these shortcomings and offer the emergence of a different sustainability ethos. In doing so, sustainability is reconceptualized as a generative concept that opens up possibilities for children to learn-with, become-with and affected by non-humans, i.e. other species and non-human forces.

Specific posthuman concepts such as assemblage, distributed agency and becoming-with are used as thinking tools. Systematic literature review and curricula content analysis are employed as methods for study one and study two respectively. Study three and study four draw ideas from post-qualitative inquiry which employ concepts that allow to experimentally engage with the world and think with/become-with data.

The latter two studies empirically demonstrate emerging possibilities of learning for sustainability with the non-human others/material forces and other species. In the end, the dissertation highlights that post-humanist and new materialist perspectives can provide a post-anthropocentric conceptualisation of sustainability, which paves the way for a more relational ontology, one that could in turn create a pedagogical practice supporting sustainability.

Table of Contents

CHAPTER ONE: INTRODUCTION.....	15
1.1.Orientations of sustainability in Early Childhood Education	15
1.2.Problematization of singling out the individual, agentic and empowered child	17
1.3.(Re) conceptualizing sustainability in ECE.....	19
1.4.Sustainability and ECE in a United Nations context.....	20
1.5.Sustainability in ECE in a Swedish context.....	22
1.6.Point of departure.....	22
1.7.Research aims	23
1.8.Research questions.....	23
1.9.Concepts and methods.....	24
1.10.Dissertation organization	25
CHAPTER 2: EARLIER AND EMERGENT RESEARCH ON SUSTAINABILITY WITHIN EARLY CHILDHOOD EDUCATION.....	27
2.1.Earlier research on sustainability within Early Childhood Education	28
2.1.1.Ecologically oriented research/The ecological approach	28
2.1.2.The socially critical approach.....	30
2.1.3.Agency and participation strand.....	31
2.2.Emergent research in ECE in general and ECEfS in particular	32
2.2.1.Posthuman studies within ECE	32
2.2.2.Sustainability and environmental studies from a posthuman perspective within ECE	35
2.3.Sustainability studies within Swedish Early Childhood Education	38
2.4.Point of departure for this study	40
CHAPTER THREE: A POST-ANTHROPOCENTRIC CONCEPTUALIZATION OF EARLY CHILDHOOD EDUCATION FOR SUSTAINABILITY.....	43
3.1.The Post-anthropocentric turn.....	43

3.2.The ontological and epistemological multiplicity of Assemblage Theory.....	45
3.2.1.A Post-anthropocentric conceptualisation of subjectivity and agency.....	47
3.3.Anchoring concepts with the empirical Work	52
CHAPTER FOUR: METHODOLOGY AND NATURE OF INQUIRY ..	55
4.1. Interpretive descriptive component of the study	55
4.1.1.Systematic literature review	56
4.1.2.Curricula content analysis.....	57
4.2.Post-qualitative inquiry.....	59
4.2.1.Characteristics of post-qualitative inquiry	59
4.2.2 Empiricism and data in post-qualitative inquiry.....	62
4.2.3.Data assemblage.....	63
4.2.4.Researcher’s journey and experienced challenges	66
4.3.Ethical considerations	70
CHAPTER FIVE: SUMMARY OF FINDINGS	73
CHAPTER SIX: DISCUSSION.....	77
6.1.‘Becoming sustainable’	77
6.2.The unfolding relational and affective child.....	81
6.3.Rethinking education.....	83
6.4.Rethinking approach to inquiry in ECEFS.....	86
CHAPTER SEVEN: THE PURSUIT OF MULTIPLE WAYS OF KNOWING FOR SUSTAINABILITY: SUGGESTED WAYS FORWARD	89
SUMMARY IN SWEDISH.....	93
Syfte	93
Forskningsfrågor	94
Teori och metodologi.....	94
Kunskapsbidrag	98
REFERENCES.....	101
APPENDICES.....	116

Acknowledgements

Next to none, let the utmost praise be to the ALLMIGHTY LORD for his relentless love, protection and enabling grace that has hold me firm toward the successful completion of this long and demanding journey over the last four and half years.

I am deeply grateful to Carl Bennet A.B. for the generous provision of funding for the PhD.

I am thankful to several people who have involved me and helped me along the way. I would like to convey my deepest gratitude to my supervision team. I could not ask for a better and stronger team than working with three well-grounded scholars; professor Arjen Wals, associate professor Helena Pedersen and associate professor Benjamin Knutsson. Thank you for all the intellectual engagements we have had over the years.

Arjen-I am indeed fortunate to have had the opportunity to closely work with you. Thank you for believing in me and standing by me from the outset to the end of the journey. You have remained unreserved to care, lift me up, encourage and support me despite geographical limitations. Thank you for all the enriching conversations and scholastic engagement throughout the course of the research. You have given me experiences that I will cherish for the rest of my life in academia. I have learnt a great deal from you, and you have certainly left on me an indelible imprint of perspectives for my future research around sustainability issues.

Helena-thank you for being an integral person in the team. Particularly, your well reputed expertise pertaining to the conceptual aspect of the work has remained quite fundamental throughout the course of my work. You have been a critical friend, a thought partner and have challenged my thinking over the years, which has helped me adopt a critical stance towards the concepts I dealt with. I remain grateful for the vital role you played as a supervisor.

Benjamin-thank you for getting on board with me from the onset of this journey. I am very grateful for your meticulous reading and critical engagement with my text. It has been a worthwhile endeavor to engage with your critique and the key questions you pose. I have significantly benefited from your several strategic tips in text structuring, precise formulation, cautious word choice and

how to deal with reviewers' comments. I would also like to thank professor Ingrid Pramling Samuelsson who was part of the supervision team halfway through the project.

I am very grateful to the children, the teachers, the parents and the school administration for their warm welcome, enthusiasm and wonderful cooperation shown during my school visits.

I remain thankful to the discussants at my planning, mid and final seminars: Helene Brembeck, Anna Palmer and Anne Beate Reinertsen, whose insightful and constructive comments has been of paramount importance to move forward in the project.

I am very honored to collaborate with the Transnational Dialogues for Sustainability Research in Early Childhood Education research group. I cannot thank you enough for all the scholastic engagement I have had with such an amazing group of international scholars. We shared a range of experiences from writing a joint publication to conference collaborations and engagement in a PhD course.

I extend my gratitude to Olof Frank and Christina Osbeck for creating the wonderful opportunity to join the book project which made my first publication possible while serving as a spring board for other articles in the dissertation.

I am very appreciative to the staff at the Gothenburg Center for Sustainable Development, GMV. It has been quite a rewarding experience to work as sustainability coordinator and to collaborate with the environmental management team. Particularly, it has been quite an enriching experience to closely work with Eddi Omrcen and to initiate two successful projects: GUSTA (Gothenburg University's Sustainability Thesis Award) and a series of the ESD Forum that has been running since 2017. Eddi-thank you for the excellent leadership style you demonstrate within the team.

I will always remain indebted to the Department of Pedagogical, Curricular and Professional Studies for offering such a flexible and conducive work environment. Particularly, I am thankful to Jonas Emanuelsson and Anita Wallin for the warm welcome that helped me start the journey with ease. Angelika and Sylvana-thank you for efficiently continuing that which Anita started. Thank you for all the follow up and facilitation of my progress along the way. My gratitude also goes to the administrative staff at the department, particularly Rebecca Namanzi, Cristina Sorensen and Ewa Stackelius. You all have been keen to help me in various administrative issues. Evalise Johannisson

and Anna Rehn-thank you very much for your cooperation at the final printing stage of the dissertation.

I am grateful to the ESD research group for their various engagement with my work at different occasions. I would also like to convey my gratitude to Miranda Rocksén and Maria Svensson for creating the opportunity to join and collaborate in the STINT project. Miranda-thank you for all the support and care in various matters.

I am also very thankful to Simon Ceder and Martin Hauberg for their engagement in reading and commenting my draft in its early phase. Catarina Player-Koro, I am thankful for your comments on my proposal right before the planning seminar.

I owe a great deal of appreciation to Jason Travis, Mulugeta Hailemeskel and Catherine Gunnarsson for proofreading different sections of the dissertation at different times along the way. I am also deeply thankful to Marie Grice, Jonna Larsson and Anna Maria Hipkiss for their engagement in translating the Swedish summary.

Last, certainly not least, I am deeply grateful my wonderful wife, Meron Mekonnen, who shouldered the toughest and most important responsibility at the home front. You have elegantly nurtured our girls, Eliana and Abigail (the joys of our lives) while I spent longer and longer hours at the office wrestling with the dissertation. I certainly owe you a great deal. I am also thankful for my entire family, my father in particular, for having faith in me, which has remained a source of fresh impetus and helped me remain committed throughout the project work.

Gothenburg, 8th February, 2020

Chapter One: Introduction

1.1. Orientations of sustainability in Early Childhood Education

We are living in an era where we are facing runaway climate change leading to massive loss, and extinction, of biodiversity. Humanity bears the responsibility for both the out of control and the, by now, enormous impact of these interrelated phenomena, and not just on the human species. However, not all humans bear these responsibilities equally. Some contribute far more than others; some by choice, some by force; some unwillingly, without knowing, others, perhaps not willingly, but being fully aware. Although humanity is not one homogenous entity, it has, as a species, the responsibility to respond, restore and regenerate in order to find other ways of living on Earth, ways that consider the intrinsic value of all life on Earth, the complex web of life and the existence of planetary boundaries (Rockström et.al. 2009). One way to do this is to explore and try-out alternative ways of being and knowing that facilitate more sustainable ways of living. Education has a key role to play in enabling people to contribute to such ways of being and knowing (UNESCO, 2016b) but how to do this remains disputed.

In this thesis, I look particularly at the way ECE (early childhood education) can contribute to possible responses to global sustainability challenges. It has been widely known for a long time that what happens early in life is foundational for future behaviour, in general but also in relation to environment and sustainability (Wilson, 1996). Early childhood education has been considered to play a central role in shaping values, attitudes and fundamental perspectives early in life (Siraj-Blatchford, 2009).

Historically, some early childhood scholars and educators have tried to conceptualize and develop early childhood education in ways that would enable young children to engage with issues related to nature, environment and, more recently, sustainability (Davis and Elliott, 2014). Based on a review of some of the key sustainability literature in ECE (see Article I in the appendices and Chapter Two of this dissertation), there are three major strands/orientations of research that have informed sustainability within early childhood education: an

ecological one emphasizing connection with nature and the development of ecological literacy; a socio-critical political one focusing on collective change and challenging structures and power relations; and one focusing on agency and empowerment of the individual child.

The ecological approach, having its roots in nature conservation education, is one of the long-standing and widely employed approaches and emphasizes the need to teach children the knowledge required to love and care for nature (Tilbury et al., 2005). The socio-critical and political dimension of environmental education draws ideas from Paulo Freire's critical theory (Tsoubaris and Georgopoulos, 2013). By highlighting the need for democracy and social justice, this approach emphasizes the political dimension of learning, which calls for change through action and social justice (Kellett, 2011; Malone, 2013). More recently, scholars such as Arlemalm-Hagser and Davis (2014); Caiman and Lundegård (2014); and Davis and Elliot (2014), argued for the need and importance of recognizing and empowering children's agency and their active participation in global, societal and environmental challenges.

The aforementioned earlier approaches in early childhood education for sustainability (ECEfS) can be considered anthropocentric in that they do not actively or consciously seek to decentre the human perspective. In other words, the child and the child-rearing adults are not seen as an entangled part of nature or as equally important to other species but rather as powerful actors that can master and shape nature in good or harmful way. This anthropocentric tendency is not specific to early childhood education but has become, and always has been, a characteristic of most mainstream formal education. It may, however, unwittingly, reproduce the root problem leading to environmental vandalism that, to a large degree, can be attributed, to the prevailing idea that humans are something other than, and outside of nature, and that nature can be commodified, objectified and reduced to a passive resource to be exploited.

Recently, an alternative perspective has been emerging that advocates decentring the human and developing a more relational, collective and entangled way of being in the world (Taylor et al., 2012; Lenz-Taguchi, 2010; Cutter-Mackenzie et al., 2019). This might be a critically needed perspective for alternative ways of knowing which helps to foster sustainable ways of living. Grasping what such a perspective entails, specifically in the context of early childhood education for sustainability, lies at the heart of this thesis. The section below further develops the rationale for exploring perspectives that are more

relational and that decentre the human by first addressing potential shortcomings of the aforementioned earlier orientations.

1.2. Problematization of singling out the individual, agentic and empowered child

The aforementioned three perspectives have positively impacted the expansion of environmental and sustainability education for multiple decades. However, it has not been well explored how far they challenge the essentialist ontological and epistemological assumption that separates the child from the non-human world, i.e. other species and non-human forces. Recently, a number of scholars have pointed out the tendency of these perspectives to be anthropocentric and to create an artificial boundary between the child and the non-human world by solely focusing on human agency and by perceiving non-humans as passive (Cutter-Mackenzie et al., 2019; Malone, 2017; Taylor, 2013). The ontological and epistemological premises of these approaches tend to rely on human agency and subjectivity, which unintentionally disregard the agentic characteristics of other species and non-human forces.

By confining themselves to human subjectivity and stressing children's agency, these approaches reinforce the ontological separation between the human child and the natural environment or what is commonly referred as "nature" (Taylor, 2013; Cutter-Mackenzie et al., 2019). In doing so, these strands overlook the agentic characteristics of non-humans. They are child-centred and mainly aspire to build up children's agency, considering non-humans as a background for humans to act on. By doing this, they foster an ontological and epistemological separation between the human child and the wider physical and non-human world. Underpinning assumptions in these child-centred pedagogies and research approaches rely on a pre-existing, knowing human child and what he/she is able to think and do (Taylor et al., 2012). The child is considered to be the centre of knowledge production while the non-humans and the material world are considered to be passive beings awaiting children's action.

Although the idea of empowering agency has helped challenge the romanticized view of children, it has not offered a way out of the established anthropocentric worldview in educational practices. Put differently, emphasizing children's agency has not (by and large) led to the recognition of

the entanglement of humans and the environment/"nature". The fundamental premises of this tenet relied solely on human subjectivity.

In particular, the focus on children's ability to think, understand, recognize and act has created a gap for the inclusion of non-human actors, as it often grants and attributes consciousness and agency to the human. The 'agentic child' perspective tends to emphasize the importance of the human and ignores that of the non-humans, the natural phenomena and their vital materialities. As a result, such a perspective is inadequate to challenge the deep-rooted anthropocentric approach which creates the divide between human and non-human. This is problematic when considering the realization of humans intricate entanglement with non-human others as a key stepping stone towards sustainable living.

I argue that a sole focus on children's agency is preventing us from rethinking the deep-rooted anthropocentric assumptions and practices that tend to dominate ECEfS. Emphasizing children's agency may also obscure other possibilities by perpetuating the existing anthropocentric practices (Weldemariam, 2017a, 2017b). It should be noted that my intent is not to disregard agency and empowerment of children, but rather to challenge the excessive emphasis and weight put on children's agency at the expense of others' (non-humans') agentic characteristics.

Although sustainability has been widely conceptualized in ECE, it has not adequately been empirically investigated in practice, particularly from a post-anthropocentric perspective. Therefore, drawing on concepts from the philosophy of posthumanism, I empirically explore whether such a relational and post-anthropocentric way of being in the world could be another way of knowing and becoming more sensitive to addressing global environmental challenges. How such perspective can be enacted and performed in practice is indicated in Articles III and IV.

Arguably, young children have not yet been enculturated with an anthropocentric perspective as much as their adult counterparts. The cultivated and, conditioned separation of the world into subject and object is not yet as well established in young children. In a sense this, perhaps somewhat ironically, offers better possibilities still for conserving and enhancing more relational ways of being in the world. Conventionally, early years education promotes an approach wherein children are guided and taught about the world by adults and learn from different experiences, which possibly creates division between human and non-human. This assumption entails that children are considered as

“isolated” subjects who are expected to learn and get it right, and eventually become environmental stewards.

1.3. (Re) conceptualizing sustainability in ECE

Despite its continuous expansion, reconceptualization and methodological rethinking within childhood studies, ECEFS has not been rigorously challenged from a conceptual and methodological point of view. How the notion of sustainability is understood, and how the complex concept of sustainability plays out in the lifeworld of children, its curricular manifestation and the accompanying pedagogical practices have not been sufficiently explored, and in some cases have remained vague and challenging to implement (Strange and Bayley, 2008). For instance, Inoue et al. (2016) show early childhood teachers in Japan and Australia do not have a well-developed set of ideas and practices in education for sustainability (Inoue et al., 2016).

This urges me as a researcher to interrogate the conceptualization of sustainability in early childhood. I argue that there is a need for more fruitful and generative conceptualizations of sustainability. The current focus on children’s agency does not offer an adequate way to deal with sustainability challenges. Since curricula are important documents shaping practice, how sustainability manifests itself in curricula documents is an important question. This question is central in the second article of this dissertation where we (myself and international colleagues) conduct a cross-national dialogue on curricular manifestations of sustainability.

These questions are even more important in the current Anthropocene predicament. The Anthropocene highlights the era wherein human activities have increasingly and widely altered the planet’s ability to regulate and sustain itself (Crutzen & Stoermer, 2000). The Intergovernmental Panel on Climate Change (Allen et al., 2014) has clearly indicated the precarious state of the planet, and that humanity has a dwindling window of opportunity to do something about it.

As many argue, there is a need to rethink our way of being in the world, to find an alternative way of knowing and a new ethical value: otherwise we, potentially, jeopardize our own existence as a species. For instance, Gibson et al. (2015) argue that to reverse the damaging human-centric behaviours, we first need to question our way of thinking and “become aware” of dysfunctional ontological predispositions, and to articulate and enact alternative ones.

Scholars such as Ives et al. (2018) attribute environmental sustainability problems to humans' lack of connectivity and relations with the world that we are enmeshed in and with other species. This attribution relates to the anthropocentric conceptualization of sustainability which is shown in Articles I and II of this dissertation.

Education has to play an important and pivotal role in rethinking our ways of being and ways of knowing. UNESCO's (2016b) global education monitoring report has emphasized the potential and critical role that education plays in connecting people and planet. Although there have been different efforts to reorient education towards sustainability and sustainable development, there has not been adequate research to suggest alternative ways of being to rethink humans' relationship with the planet. Among the existing efforts include the research by the Common Worlds Research Collective (2018), which challenges the ingrained idea of an autonomous individual child and reconceptualization of the child as entangled with the more-than-human world (Abram,1999)-particularly animals. Pedersen (2019) also challenged the taken-for granted human-animal relationship (animals as necessary resource to be utilized for teaching-learning process) that modern education perpetuates and introduced disruptive actions that could possibly lead to the liberation of animals. Hence, a corresponding pedagogy that nurtures a collective and a more relational way of being in the world might be one way out of this negative spiral towards unsustainability.

1.4. Sustainability and ECE in a United Nations context

There have been several global initiatives within education to address global environmental challenges. One significant initiative was the introduction of United Nations Decade of Education for Sustainable Development (2005-2014) aimed at integrating the principles, values and practices of sustainable development into all aspects of education and learning. However, this initiative has an inherently anthropocentric bias. Highlighting the limitations of the initiative, Kopnina (2014) pointed out that "ESD masks its anthropocentric agenda and may in fact be counterproductive to the efficacy of environmental education in fostering a citizenry that is prepared to address the anthropogenic causes of environmental problems" (p.73).

INTRODUCTION

In common with other stages of education, the prevailing precarious state of the planet has continued to spur a lot of debate in early childhood education (ECE), which brings about different views regarding the position of young children. On the one hand, there is a view that promotes the idea of children as important agents, who hence have to engage, and act, to save their future (Watts et al., 2015; UNICEF, 2014). This posits children as important actors in dealing with environmental sustainability challenges. Others, for instance climate change deniers, are sceptical of both the problem per se and the need for children's involvement, and even consider this as an inappropriate manipulation of children to advance a particular socio-political agenda.

With the continuous increase in humans' extractive and destructive behaviour, children of the 21st century will be disproportionately affected by uncertain ecological futures as manifested in runaway climate change (IPCC, 2018) and the accelerating loss of biodiversity (Bongaarts, 2019). Given the urgency and complexity of the problem, ECE in particular has an important role to play helping young people cope with, challenge and respond to what some refer to as systemic global dysfunction (Lotz-Sisitka et al., 2015). Hence, the early years are considered to be a particularly phase in a child's life, where ways of being and ways of knowing are "established" that are crucial for future life chances and prospects. It is argued that if children are not engaged and involved in the endeavour towards sustainability from a young age, they will be forced to live in a world that adults create and design for them (Malone, 2017).

Yet, the wider educational practice in childhood in general and ECEfS in particular still remains resistant to change and retains an inherently anthropocentric world view, which is inadequate in dealing with the current planetary challenges. The learning theories in ECE are still predominantly based on child-centred sociocultural, social constructivist and Piagetian developmental approaches (Lave and Wenger, 1991; Piaget, 1997; Vygotsky, 1986). Parallel to the learning theories, different research paradigms have been used in ECE for the last 20 years.

Predominantly, most of the research within ECE in general and ECEfS in particular tends to have positivist, hermeneutic and interpretative characteristics. These dominant theoretical orientations and research paradigms emphasize children's social worlds, cognitive processes and human interactions, which leave humans to remain within habitual anthropocentric ways of learning and looking at the world. It is this deeply rooted and inherent problem that this

study tackles to offer a post-anthropocentric alternative way of conceptualizing and enacting sustainability in ECE.

1.5. Sustainability in ECE in a Swedish context

The Swedish preschool curriculum has for a long time been promoting the need to engage young children in environmental and societal issues. Preschools in Sweden are expected to engage children with activities addressing pertinent issues such as nature and the environment, as well as democratic values and social interaction (Skolverket, 2010). More recently, the new curriculum for preschool explicitly highlights the need to emphasize sustainable development in early childhood education (Skolverket, 2018). The preschool has a duty to ensure that children develop respect for all forms of life and care for the surrounding environment (Skolverket, 2018). Features of a strong nature-oriented outdoor education tradition and an ecological approach have long been evident in Swedish preschool education (Halldén, 2011). Children are viewed as part of nature and its cycle; how people, nature and society influence each other; conservation and caring attitudes towards nature have remained an important focus in the curriculum (Skolverket, 2010, 2018). However, the wider understanding and the pedagogical approaches employed focus on children's agency and their empowerment, i.e. they do not explicitly recognize the agentic characteristics of the non-human world.

1.6. Point of Departure

As indicated in the systematic review (Article I of this dissertation), there is a deeply rooted anthropocentric tendency in ECE, which is key obstacle in moving towards sustainability. This thesis challenges this tendency and looks for alternative post-anthropocentric approaches that are more relational and collective, which in turn require conceptual rethinking and alternative ways of knowing and being. Posthuman scholars such as Ferrando (2016) are calling for:

...“a post-anthropocentric turn by emphasizing the fact that the Anthropocene and the actual ecological collapse are only the symptoms; it is time to address the causes, which have been detected in the anthropocentric worldview based on an autonomous conception of the human as a self-defying agent...and hence a theoretical and pragmatic post-anthropocentric shift in the current perception of the human” (P.159).

INTRODUCTION

How can we challenge, if not completely let go of, the deep-rooted and inherent anthropocentric privilege/child-centred approach within ECEfS? This further brings about a question on the underpinning ontological and epistemological assumptions within the field. Thus, environmental sustainability education within early childhood education might benefit from working with an ontological and epistemological precondition that acknowledges children in relation to the non-human environment, other species and material forces.

This necessitates alternative ways of being and knowing, which in turn brings about rethinking of existing approaches around environmental sustainability. Therefore, I began this study with an exploration of its conceptualization and the accompanying practice within the wider historical, policy, practice and research discourse in the field. This led to the need to be critical and explore alternative pathways and vantage points that have the potential for illuminating the entanglements and deep-rooted connections between humans and non-humans and possibly changing our ways of knowing/being and relationships.

1.7. Research aims

The purpose of this dissertation is twofold.

- First, it explores how the notion of sustainability is conceptualized within early childhood education discourses and how it is manifested in early childhood curricula.
- Second, the dissertation explores post-anthropocentric possibilities of sustainability within early childhood education.

1.8. Research Questions

In an effort to achieve the above aims, the study seeks answers to these key questions.

- How is the notion of sustainability typically understood and conceptualized within the ECEfS field?
- How is sustainability manifested and articulated in national early childhood curricula documents?
- How may post-anthropocentric analyses generate alternative ways of conceptualizing “sustainability”?

- What “learning spaces” might emerge in and from post-anthropocentric analysis of sustainability in the context of ECEfS?

1.9. Concepts and Methods

As stated in the point of departure section above, this study begins by unveiling and investigating existing ECEfS conceptualizations to be able to sketch a more comprehensive approach for conceiving sustainability from a broader context that includes and embraces a multitude of human and non-humans actors, subjects, forces and agents. In doing so, the study itself attempts to decentre the human and brings in non-human others and focuses on their relationship and entanglement with the human child (children, teachers and myself as a researcher), i.e. a post-anthropocentric perspective.

This study is intended to expand and enrich this very slim but emerging perspective in the context of finding more sustainable ways of living. In ECEfS particularly, empirical studies with post-anthropocentric analysis are very limited. Thus, drawing on some empirical data, I am striving to contribute to both theory (use of specific concepts) and methodology development (post-qualitative inquiry) for sustainability research in early childhood education.

Conceptually, this study draws ideas from posthuman theories. The study highlights post-humanist thinking (Haraway, 2008, 2016) and its subsumed notion of new materialist (Bennett, 2010) thinking as less utilized perspectives in ECEfS, essentially making it difficult to attune to human’s inevitable entanglement with the more-than-human world (Abram, 1999). Posthumanism criticizes anthropocentric humanism and opens its knowledge enquiry to other species and the non-human world.

In doing so, it calls for rethinking subjectivity and agency. It perceives agency as “distributed” (Bennett, 2010) and subjectivity as a “non-unitary” entity (Olsson, 2009). In other words, it is not conceptualized as something that is inherent only within conscious and intentional individual beings, but, rather, something that emerges in and through relations between humans and non-humans. Likewise, in posthuman thinking, knowledge is not just a cognitive entity that is acquired through. It rather embraces the whole socio-emotional-cognitive, affective, entangled and enmeshed way of being and knowing. Details of the theoretical framework and discussion of specific concepts employed are presented in Chapter Three.

INTRODUCTION

The first part of the thesis, Article I, begins by investigating and challenging the notion of sustainability and how it has been conceptualized and evolved ever since it was introduced to the field of early childhood education. The second part of the thesis, Article II, looks at the place of sustainability within national curricula and examines how different nations (Australia, England, Norway, Sweden and the USA) embrace sustainability in their curricular frameworks. The last two studies, Articles III and IV, offer empirical cases in order to provide examples of how sustainability can be analyzed in early childhood education from a post-anthropocentric perspective. Article III addresses possibilities of engaging with ecological and climate issues by engaging with materialities of the weather. Article IV indicates alternative ways of engaging with species extinction issues through becoming-with animals, bees in particular.

Systematic literature review and curricula content analysis are employed as methods for Studies One and Two respectively. Studies Three and Four draw ideas from post-qualitative inquiry. Post-qualitative inquiry is a generative way of experimenting with the world (St. Pierre, 2018). It challenges the traditional conception of data, the position of the researcher and the concept of empiricism. In a post-qualitative inquiry, data is not something external to be collected by the researcher, but the researcher himself/herself “becomes-with” and “knows-with” the data. In doing so, it introduces the concept of infra-empiricism (Clough, 2009; MacLure, 2011), which is an expanded empiricism that embraces forces and perspectives beyond the perception of the conscious human subject. Thus, data is understood as an assemblage of the human researcher, human children, other forces and the wider non-human world. Studies three and four, in this dissertation, particularly focus on Nordstrom’s (2015) concept of data assemblage, which helps to empirically demonstrate possibilities of learning for sustainability with the non-human world/non-human actors, i.e. other species and material forces.

1.10. Dissertation Organization

The dissertation is composed of four introductory chapters and three synthesizing chapters. Chapter one introduces the purpose, perspectives and concerns of the dissertation. Chapter Two presents previous studies. Chapter Three presents the theory and discussion on specific concepts employed. Chapter Four presents the methodology and nature of inquiry section, which

consists of: systematic review for Article I, curricula content analysis for Article II and post-qualitative enquiry for Article III and IV. Chapter Five offers a summary of the findings in the four articles. Chapter Six presents a meta-level discussion and critical reflection by offering the knowledge contribution and broader implications of the study for sustainability education at large and ECEfS in particular. Chapter Seven contains ending remarks, recommendations and highlights the need for continuous quest for ways of knowing for sustainability. Table 1 provides an overview of the dissertation.

Table 1. Summary and tabular presentation of the dissertation

Introductory Chapters	
<ul style="list-style-type: none"> • Purpose, perspectives and concerns. • Previous work on ECEfS and sustainability. • Theory and key concepts. • Methodology and nature of inquiry. 	
Article I	Article II
<ul style="list-style-type: none"> • Conceptualization of sustainability in the history, policy and research within the field of ECEfS. • Systematic literature review. 	<ul style="list-style-type: none"> • Current status quo of sustainability as manifested in national curricula frameworks. • Curriculum content analysis.
Article III	Article IV
<ul style="list-style-type: none"> • Post-anthropocentric-analysis- Example I • Child-weather assemblage • Post-qualitative inquiry 	<ul style="list-style-type: none"> • Post-anthropocentric analysis - Example II • Becoming-WITH the bees • Post-qualitative inquiry
Synthesizing Chapters	
<ul style="list-style-type: none"> • Summary of “findings” • Discussion and critical reflections: Rethinking sustainability, education, the child and nature-of inquiry • Implications: Towards a relational pedagogy for ECEfS • Way Forward: The Pursuit of Multiple Ways of knowing for Sustainability 	

Chapter 2: Earlier and Emergent Research on Sustainability within Early Childhood Education

It is widely acknowledged that the quality of childrens' experiences in the early years can have lasting effects on lifelong learning and well-being, educational attainment, and, on society as a whole (Siraj-Blatchford et al., 2008; Karoly et al., 2005). As values, attitudes, behaviours and skills are formed during the early years, scholars argue that sustainability education needs to be featured in early childhood education (Cutter-Mackenzie & Edwards 2013; Pramling Samuelsson, 2011; Siraj-Blatchford, 2009; Davis, 2008).

The recognition of the link between environmental sustainability issues and early childhood education (ECE) dates back to the 1990s. Davis and Elliott (2014) argue that it is the recognition of the unique affordances of children's curiosity that has led to the identification of ECE as a foundation for lifelong learning and the development of pro-environmental values and attitudes. Despite this recognition and movement, until recently, the notion of sustainability had not been widely researched or overtly incorporated into ECE policy frameworks and pedagogical practices. UNESCO's first official report on the subject, *The Contribution of Early Childhood Education to a Sustainable Society*, by Pramling Samuelson and Kaga (2008), was the first initiative to explicitly address sustainability within ECE. This report contributed to an increased interest in the concept of sustainability within early childhood pedagogy, curricula and research. Building on the work of UNESCO, the World Organisation for Early Childhood Education (OMEP) made a plea for the expansion of the field by highlighting the link between ECE and sustainability (Siraj-Blatchford et al. 2010). Today, although there is an expansion of the body of knowledge, there is still a need for more research in the field to inform practice (Somerville and Williams, 2015).

In this chapter, I present and discuss earlier and more recent studies relevant to the aim and the research problem in focus. I will first present and discuss earlier studies focusing on: their thematic focus, their theoretical and philosophical approaches and their methodological orientations. I will then

discuss emerging trends of posthumanist research within ECEfS. Subsequently, I will zoom in on studies within the Swedish context, as this is the context in which my research is located. In the closing section of the chapter, I will demarcate the point of departure of the present study and indicate how it relates to existing bodies of knowledge.

2.1. Earlier Research on Sustainability within Early Childhood Education

As indicated in Chapter One, there are three major strands of sustainability research informing early childhood education: ecologically oriented, socio-critically oriented and studies oriented towards agency and participation. Research within these three strands has played an important role in shaping sustainability education in early childhood education. These studies have employed different theoretical/philosophical and methodological orientations including: positivist, interpretivist/hermeneutical, critical-theory oriented and rights-based approaches. Detailed descriptions of each strand follow in the sections below.

2.1.1. Ecologically Oriented Research/The Ecological Approach

Emanating from nature conservation education, the ecological approach has long been emphasizing the need to teach children the knowledge and sensitivity required to love and care for nature. Among other things, this includes the knowledge-based approach (Tilbury et al., 2005) and the immersive learning approach influenced by Jean-Jacques Rousseau's classical work which promotes children's learning in "nature" (Rousseau, 1979). Oftentimes, experiential and immersive pedagogy is advocated to intensify children's exposure and connection to nature. Drawing from Jean-Jacques Rousseau (1979) and, more recently, Richard Louv (2008), outdoor education is considered critical in creating possibilities for children to develop love and care for nature. Rather than the explicit teaching of nature as a topic, the immersive approach considers "nature" as a natural learning context (Sobel, 1996; 2008; Louv, 2008). While this approach has been a common practice in different parts of the world, it has been given explicit emphasis in the Scandinavian context (Robertson, 2008).

EARLIER AND EMERGENT RESEARCH

Most of the studies within this strand are conducted within the so-called positivist empirical analytical research paradigm which considers children as a research object and education as an intervention that can be designed, implemented and evaluated on the extent to which they achieve pre-determined outcomes. Positivist studies within ECEfS are often quantitative in nature, and tend to examine behavioral aspects such as: children's environmental knowledge, attitudes and beliefs regarding the environment and how environmental education influences these 'behavioral components'. For instance, Hadzigeorgious et al. (2011) made a comparison of teaching methods, and concluded that storytelling is a better pedagogy to teach young children about the value of trees than directly teaching about trees. Other studies within this vein explore children's knowledge and awareness of environmental issues such as global warming; tropical rainforests; biodiversity loss; and waste management (Palmer, 1995; Palmer & Suggate, 2004) or their attitudes, beliefs, perceptions and achievements in environmental education and outdoor learning spaces (Kahriman-Öztürk et al., 2012; Hadzigeorgious et al., 2011). Typically pre and post tests and control groups are used to show whether a particular educational intervention leads to a change in these behavioural aspects.

A range of methods has been employed by positivist studies having an ecological focus. For instance, scholars such as Ergazaki & Andriotou (2010); Palmer et al. (2003); and Palmer & Suggate (2004) used individual interviews, illustrations and photographs to explore children's knowledge, awareness, understanding, thoughts and views. Others used a questionnaire to explore preschool children's environmental attitudes and the level of their environmental knowledge (Grodzieska-Jurczak et al., 2006).

Another theoretical orientation is the interpretative hermeneutical approach. Scholars using this approach are mainly situated within dominant "connection to nature" and "children's rights" discourses (Gambino et al., 2009; O'Gorman and Davis, 2013). Emanating from the legacy of Rousseau, studies that are situated within the "connection to nature" discourse are concerned about children's alienation from nature, and they stress the need to reconnect children to nature (Taylor, 2013). An assumption underlying these studies is that children are alienated from nature - and that they should be reconnected to it. Implicit here is the notion that nature and culture are separate entities. Likewise, an interpretative study by Cutter-Mackenzie & Edward (2013) has revealed the

possibility of intentionally integrating sustainability issues, such as biodiversity, in to children's pedagogical play.

Research within this strand emphasizes behavioral change for a sustainable future, that is, they are human/child-centred and rely on the cognitive and meaning-making processes of the autonomous and learning child.

2.1.2. The Socially Critical Approach

The socially critical approach recognizes that there are powers and structures at work that steer away from a more relational and equitable way of being in the world and promote the need to challenge, question and change these powers and structures.

Some of the research under this strand addresses children's rights (Engdahl and Rabusicova, 2010) and is mostly related to the ESD initiatives by the UN and is oriented towards the three pillars of sustainability: environment, society/culture and economy (Brundtland, 1987). Research within this paradigm is not so much pre-occupied with dissecting children's behaviour into variables and understanding how they influence each other, but rather in coming to understand the world of children 'through the eyes of the children' and interpreting what that might mean for how we might best support their learning.

Researchers within this strand employ a critical perspective and allow teachers and children to be involved in the research process, and the purpose is to bring about change and transformational processes. An example of this is a study by O'Gorman & Davis (2013), who analyzed preservice teachers' and students' responses to an ecological footprint calculator as a tool for engaging staff and students in the learning and teaching of sustainability. Likewise, guided by critical theory and an ecofeminist perspective, Ärlemalm-Hagsér (2013) conducted a curriculum-oriented study that examined children's agency and meaning making within sustainability pedagogy in preschool. Her study indicated the prevalence of sustainability issues in a preschool setting as a content-based and thematic approach within the curriculum. This study also indicated the potential of preschool as a transformative arena for the expression of different political and practical agendas. Unlike the ecologically oriented strand, research within the socially critical strand puts much weight on coming to understand what role resilient structures and power relationships play in shaping the world of the child and children's learning.

EARLIER AND EMERGENT RESEARCH

Another widely employed theoretical orientation under the socially critical strand is the constructivist and sociocultural framework. Researchers using this orientation are interested in children's learning for sustainability within their social context and surrounding community, involving teachers, parents and the wider community. These researchers emphasize the importance of home/school partnerships, children's community experience and active participation as citizens (Barratt et al., 2014; Engdahl and Årlemalm-Hagsér, 2014; Ji and Stuhmcke, 2014; Mackey, 2014; Phillip, 2014; Young and Cutter-Mackenzie, 2014). This framework indicates the need for those involved in ECE to facilitate and organize such opportunities for children.

Research within this strand tends to employ mixed method approaches to generate data from children, teachers and parents with various degree of participation. As children do not always have a wide range of first-hand personal experiences of people and society, they depend on indirect and socially mediated sources of information, such as parents, teachers, friends, siblings and TV (Barrett & Buchanan-Barrow, 2005). There are some studies that have explored the influence of parents' attitudes and behaviours on children's attitudes and practices in terms of environmental issues. The results indicated a positive relationship between child and parent attitudes and behaviors (Grodzieska-Jurczak et al., 2006; Musser & Diamond, 1999). Within this approach, there is a tendency to conduct research with children, although the analysis of these studies is dominated by adults.

2.1.3 Agency and Participation Strand

In the past few years, the early childhood field has continued to emerge as an important phase in education that can contribute meaningfully and significantly to the quest for sustainability and sustainable development (Engdahl, 2015). In line with this, the international OMEP world project revealed the power of children's voices on issues pertaining to sustainability (Engdahl & Rabušicová, 2010), which led to the emergence of the agentic child discourse. According to this initiative, the notion of children as active citizens and important stakeholders in this endeavor, has become an important agenda item for researchers, educators and advocates. Altogether, this has led to the expansion and promotion of children as active agents and meaning makers. This brings about the necessity to pay attention to children's voices and perspectives, and

hence to their active engagement in the data collection process, i.e. research by children approach.

The notion of children as agents for critical change has been strongly promoted and represents a counter reaction to the idea of children as immature beings who are on their way to becoming adults (Taylor, 2013; 2017). This conceptualization of the agentic child has continued to shape research, policy, curriculum and pedagogy in early childhood education. Apart from challenging a romanticized view of young children, the agentic child discourse has enhanced the field of Early Childhood Education for Sustainability (ECEfS) by emphasizing their role in societal global challenges. This has resulted in the notion of children's agency becoming a widely accepted and celebrated view in early childhood education (Caiman and Lundegård, 2014)).

2.2. Emergent Research in ECE in general and ECEfS in Particular

This section presents and discusses emerging posthuman research within early childhood education in general and ECEfS in particular. In the first half of this section, I will present general studies on posthumanism in early childhood education. The second half specifically focuses on sustainability studies from a posthuman perspective.

2.2.1 Posthuman Studies within ECE

There is a growing body of research within early childhood studies that uses posthuman theories and explores issues beyond the human child. A study by Bradley et al. (2012) examines infants' mealtime from an assemblage point of view within Australian family day-care. Using the concept of assemblage, which will be elaborated in Chapter Three, the study described how a group of toddlers interacted during mealtime through verbal and non-verbal means such as touching and the exchange of food and beverages. In this study, the assemblage is constituted by not just the human child but also the non-humans involved - the bottles, highchairs, technologies, regulations, food, gravity, etc. While embracing the ethos of participation, the study steps away from a binary logic of identity (e.g. self-other, adult-infant, subject-object) that usually implicitly underpins such approaches. Instead, it demonstrates the generativity of concepts of 'assemblage,' 'event,' 'line of flight,' in rethinking what should form the focus for the theorizing, pedagogy and practices surrounding infants

EARLIER AND EMERGENT RESEARCH

and toddlers. The study indicated that a recognition and appreciation of this complexly assembled relations helped the researchers unpack some of the layered effects of connection, power and becoming. Through the relations afforded by and made between these diverse elements, the descriptions of mealtime show how highchairs and their allies may afford a new infant world symbiosis that entails not just a time and place to eat, but access to unanticipated relations of power, opportunities for connection, and ways of becoming (Bradley et al., 2012).

A multi-sensory ethnography by Renold and Mellor (2013), involving working-class children in the UK, explored how children are “doing gender” in the social, material and cultural world of the nursery. It examined how gender works on, in and across bodies and things while focusing upon the affective and actively embodied aspects of nursery-room assemblages. They describe infants’ relations within the nursery environment as an assembled series of multisensory doings: ‘a complex affective assemblage of other bodies and things’ (p. 24).

While much of the literature on ‘place-based pedagogy’, for example, Somerville (2015) and Duhn (2012), argues for a commitment to place-based local environments as a counterpoint to globalization, ‘place-as-assemblage’ circumvents such politics of resistance. Instead of critique and opposition, the emphasis lies on finding ways for critical engagement and new perspectives through an understanding of the forces and forms that make places, and shape pedagogies (Duhn, 2012). The article draws on New Zealand-based research to reconsider the often taken-for-granted relationship between place and pedagogy.

Drawing on the notion of assemblage, Duhn (2012) challenges the well-established subject-object binary thinking within early childhood pedagogy. She considered that ‘place’ as “an assemblage of humans and their multiple ‘others’ puts emphasis on the productive nature of forces and forms as vibrant matter” (p.99). Her notion of ‘place-as-assemblage’ overcomes the conventional understanding of place-based pedagogy which considers local places as a counterpoint for dealing with and learning about global issues. In doing so, she demonstrates how understanding place as assemblages of vibrant material opens up possibilities for critical engagement and new perspectives, which in turn shape pedagogies (Duhn, 2012).

Building on Loris Malaguzzi’s concept of environment as a third teacher, Bone (2013) challenges the taken-for-granted human-animal relationships. She

highlighted the need to consider human and animal relationships in early childhood settings in all their complexity and variety, which calls for a new ethical dimension (Bone, 2013). She argued that animals need to be acknowledged as the fourth educator and they need to be considered respectfully as a pedagogical support and motivator for learning. This in turn suggests the need to ensure similar benefits to be accrued for both animals and young children in the settings where they are learning to live together (Bone, 2013). Similarly, using animals as figures, Blaise (2014) challenges the thoughts around children, race, and class in contemporary Hong Kong. In both examples, the animals are active agents in relation to human beings: both as part of a temporary interaction and as a part of a deeper entanglement.

Timmerman and Ostertag (2011) challenges human-animal relationships portrayed in children's media such as books, toys, songs, clothing, and electronic media. Their study urges parents and environmental educators to question and challenge the message conveyed in the media. Their study particularly demonstrated "how young children's media reinforces anthropocentrism by mis-and dis-placing animals, anthropomorphizing animals, and silencing animals' subjectivity (p.31)". They in turn argue that "media diminishes the possibilities for children to know and learn from/with the more-than-human before they learn to read, write, or even speak" (p.31).

Moreover, Prout (2005) challenged the well-established child-centric way of theorizing childhood which has been widely discussed within developmental and social constructionist theory. Prout called for the re-theorization of childhood as a heterogeneous assemblage (Deleuze and Guattari, 1987), consisting of humans and a range of non-human entities including child/family/reproductive technology assemblages; child/pharmaceutical/school assemblages; and child/animal/popular culture assemblages. Olsson (2009) argues against the idea of measuring and governing children with predetermined standard measures and instead calls for more open, fluid and process-oriented ways of learning. She concludes her study of young children's relational learning in a Swedish early childhood centre by characterizing learning itself as the effect of mutable 'assemblages of desire' (pp. 133–178).

In her doctoral thesis, Hultman (2011) examined how subjectivity in preschool pedagogical practice is constituted by the interplay between humans and nonhuman materiality. Using actor-network theory, Hultman (2011) argues that children are constantly engaged in significant relations, both with humans

EARLIER AND EMERGENT RESEARCH

and nonhuman matter, and that nonhuman materiality such as pedagogical material, toys and furniture partake in and play an important role in the construction of children's subjectivities. Her study empirically exemplifies that a spade, chairs, or a ruler are not just passive tools to be used by a human agent, but also agents that affect the child and co-constitute their subjectivity.

Drawing on Barad and Deleuze, Lenz Taguchi's research (2010) promotes the agentic characteristic of pedagogical documentation in a learning environment, and introduces the notion of intra-active pedagogy. In doing so, Lenz Taguchi's research has highlighted the agential materiality of education, and the need to understand agency as an "entangled becoming" as opposed to an autonomous human subject acting alone. It is this research of hers that contributes to the disruption of hegemonic binary thinking such as: theory - practice, mind - body, and material - discursive (Lenz Taguchi, 2010). As such she argues that learning has to be conceived of as a series of post-anthropocentric intra-actions in a state of potential transformation - not just a process within a separate, independent and autonomous human/individual subject. Thus, Lenz Taguchi (2010) points out the limitations of early childhood education that focuses on measuring children's abilities in order to compare them to a specific norm of expected development, and instead argues for the idea that children "co-exist and are in a state of becoming-with each other" (Lenz Taguchi, 2010, p. 87). These important contributions suggest that the expansion of posthuman theories within ECE research might be generative.

2.2.2. Sustainability and Environmental Studies from a Posthuman Perspective within ECE

More recently, a few studies within early childhood have started to approach sustainability and environmental issues from a posthuman perspective. Highlighting the agential nature of place and its elements, Somerville and Green (2015) point out how understanding children's embeddedness in everyday local place provides a rich, natural and non-hierarchical context for connecting and engaging children with sustainability matters. By highlighting examples from children's imaginative play, they elucidate how the material and agentic qualities of place offer possibilities for learning through a direct relation with place. According to them, place offers: 'a common language that can link the local and global, indigenous and non-indigenous and different disciplinary orientations' (Somerville and Green, 2015, p. 17). They introduce a conceptual framework

of place in sustainability education that includes concepts and ideas like: ‘thinking through country’, ‘place as region’, a ‘global sense of place’ and ‘place as assemblage of more-than-human-worlds’ (p. 9).

Drawing on the notion of relationality and Maori indigenous values, Ritchie (2013) argues and empirically demonstrates how children’s understanding of their inter-connectedness and interdependence to living creatures (humans and non-humans) and non-living matter, can be pedagogically extended, as a stepping stone for enacting ecological sustainability. Ritchie (2013) points out that educators need to provide opportunities and nurture children with dispositions of relationality to humans and more-than-humans with whom we share our place and spaces in the planet.

In his study of children’s engagement in an Auckland city council’s recycling project in New Zealand, Tesar (2017) shows how having a materialist lens helps expose a force that unintentionally keeps children from becoming engaged in the project. His visual data portrays children passing by a row of huge plastic waste bins without noticing them since the bins were taller than the children. Thus, the encountered proximity between the large sized recycling bins’ bodies and the smaller bodies of the children, witnessed the “absence” of the children in the waste project. So, the encounter reveals how the non-human plastic enacts its agency and in turn elucidates how the children were overlooked in the city’s waste management project.

In an effort to respond to the critique of the anthropocentric view of nature and to disrupt the nature-culture binary, Cutter-Mackenzie et al. (2019) introduce and argue for the concept “childhoodnature” which highlights children’s entanglement with nature, and hence the need to rewrite children as nature, not separate from nature. The coined concept of childhoodnature refutes the notion of humans as the sole superior agents to care for and safeguard nature. This is also in line with Taylor’s (2017) critique of the notion of stewardship, which simply relies on human agency and the glossing over of the agency of nature/the more-than-human world. In a similar fashion, drawing on Deleuze and Guattari’s concept of becoming, Reinertsen (2016) proposes that humans need to build partnerships with the Earth and introduce the concept of “becoming Earth”. She argues that humans at large and children in particular, are not ontologically separate from the Earth. She instead calls for an educational direction that creates knowledge and practices that ensure children’s partnership with the natural world with all its inherent agentic values (Reinertsen, 2016).

EARLIER AND EMERGENT RESEARCH

With a view to rethinking child-animal relationships and pertinent pedagogies, scholars have been calling for a paradigm shift that promotes the entanglement and enmeshment of human/children with the more-than-human world at large and other forms of life in particular. A notable example is the Common Worlds Research Collective (2018), which challenges the ingrained idea of an autonomous individual child, and introduces the common worlds framework which calls for the reconceptualization of the child as entangled with the more-than-human world – particularly animals. They argue that this entanglement has concomitant ‘ethical, political and pedagogical’ implications (Taylor, 2013, p.115). Scholars within the collective (e.g. Nxumalo & Pacini-Ketchabaw, 2017; Taylor et al., 2012; Taylor & Pacini-Ketchabaw, 2015; Taylor & Pacini-Ketchabaw, 2018) have been advocating a collective future rooted in a more-than-human entanglement thinking that intentionally invites children to ‘learn-with’ other species in their everyday common world in a non-hierarchical manner.

Drawing on the case of child-pet encounters in urban classrooms, Nxumalo & Pacini-Ketchabaw (2017) highlight the inadequacy of simplistic and anthropocentric relationships to loving, caring and learning about animals. Instead, they underline the need to engage with situated, complex and emerging temporal relationships producing different affective and ethical engagements while learning with the animal. They suggest this is a pre-requisite for learning how to deal with contemporary anthropogenic challenges that children are inheriting. Likewise, Nxumalo (2018) reveals how children’s everyday entanglement with the dying bumblebees offers possibilities to relate to, learn with and respond to anthropogenic loss through various affective and embodied modes of knowing.

Moreover, drawing on the case of the swamp hen, eel and the turtle, Gannon (2017) demonstrates how an encounter with these animals can serve as a pivotal point for affective and creative engagement leading to critical inquiry and multiple modes of responding to their coexistence with humans. Although Gannon’s work is empirically anchored with secondary school students, its conceptual approach is situated within the ‘common worlds’ framework of early childhood studies. While Nxumalo & Pacini-Ketchabaw (2017) employed a multispecies ethnography to explore children’s encounter with a walking stick pet introduced to a classroom, Nxumalo (2018) employed a worlding methodology as a mode of attuning to the child-bee encounter.

The aforementioned examples highlight how a child's life is always entangled with other agents which include: materialities, the atmosphere, artefacts, places and other species and the difficulty of exploring research and practice without being mindful of such an ontological coexistence. The examples elucidate that knowledge production for environmental and sustainability learning is not necessarily limited to the human subject, but also includes other non-human subjects and their capacity to act and create affect in both humans and non-humans-see definition and description of affect in chapter three. Although the potential of posthuman thinking for addressing environmental and sustainability issues has been pointed out by the aforementioned scholars, not much work has been done on how such thinking can be employed for sustainability research. In particular, studies with post-qualitative research orientations are very scarce in environmental sustainability research within ECE. This study seeks to expand this emerging approach to ECEfS and to doing research.

2.3. Sustainability Studies within Swedish Early Childhood Education

In Sweden, where this project is mainly located, children have long been recognized as important agents for change. Preschools in Sweden have been working on various aspects (environmental, social and economic) of sustainability for a long time (Ärlemalm-Hagsér, 2013; Dahlbeck, 2014; Dahlbeck & Tallberg Broman, 2011). All the three earlier research strands can be found in the Swedish context. Topics such as personal health, lifestyle issues, individual competence and children as actors shaping a better future society, characterized by social stability, health, and economic progress, have been deep rooted in preschool pedagogical activities (Dahlbeck, 2012). Children have long been recognized as important agents influencing the moral and ethical values of families and the wider community (Dahlbeck, 2012; Dahlbeck and Tallberg Broman, 2011).

As clearly pointed out both in the earlier and recently revised Swedish curriculum for the preschool, nature-oriented outdoor education has a longstanding tradition in Swedish preschool (Skoleverket, 2011, 2018). The curriculum highlights that themes such as: cycles in nature-the importance of connections between species, interdependence; relations, caring and empathy; and ecological relationships have remained an inherent tradition in the early

EARLIER AND EMERGENT RESEARCH

years education. More recently, such focus has been made even more explicit. The revised preschool curriculum states that “Education should be undertaken in democratic forms and lay the foundation for a growing interest and responsibility among children for active participation in civic life and for sustainable development-not only economic, but also social and environmental” (Skoleverket, 2018, p.5).

Despite such well-reputed practices, research on sustainability related topics is scarce but is expanding. One of the early works by Pramling Samuelsson & Kaga (2008) demonstrates several different examples from all over the world and explores examples of life questions, gender perspectives on outdoor education and communicating science in the Swedish context. Another study, drawing on data from a nine-month ethnographic study with six Swedish preschoolers, by Endghal (2012) focuses on social sustainability with an emphasis on democracy and gender issues. Endghal’s study has particularly focused on toddlers’ social competence and how they form friendships. The study shows the various ways through which children make friendships.

A study concerning teachers’ understanding of and work with Education for Sustainability (EfS) was conducted in 187 Swedish preschools and the data was gathered through the use of a questionnaire. The results showed that EfS was mainly associated with environmental issues, such as nature experiences, recycling, reuse of resources and reduction of waste (Årlemalm-Hagsér & Sundberg, 2016).

Hedefalk et al. (2014) explicitly focus on Education for Sustainable Development (ESD) and action competence as a theme and explore various aspects of ESD which include: education about, in and for the environment; education including economic, social and environment pillars; and also teachers’ understandings of ESD and how it can be implemented, its curricular integration, pedagogical adaptation and children’s meaning making for ESD. Considering teaching and children’s participation as meaning making, they explored how pedagogies and critical actions are executed in Swedish preschool settings. Drawing on John Dewey’s notion of pragmatism, Hedefalk and her colleagues observed the meaning making activities that take place in the preschool setting which revealed that: children’s development of action competence depends on the actions considered important by adults; and teachers’ moves have been identified as an important factor influencing the meaning-making process; along with children’s experience of critical actions involving making value judgments. The work by Hedefalk et al. (2014) calls for

a shift from literacy to action-oriented education (i.e. children as competent actors).

More recently, drawing on social learning theory, Borg (2017) examined children's knowledge and practices of sustainability as a way of caring for people and the planet. Focusing on eco-certified schools in Sweden, this study explored the role and impact of ecocertification in children's learning for environmental and sustainability issues. In doing so, Borg investigated and compared the knowledge and practices of sustainability among children attending eco-certified and non-eco-certified preschools. The study employed mixed methods, using interviews with children and questionnaires for guardians. Borg (2017) also explored preschool and home-related factors in children's learning for sustainability. She indicated that children's understanding was enhanced by: discussion with teachers, involvement in recycling and the priority preschool gives to EfS. Children's practical knowledge benefitted from active participation in activities, e.g. recycling, visit to recycling station with teachers.

As described above, all the earlier research strands can be found in the Swedish context. Yet, the emerging posthuman strand is not employed for addressing sustainability issues in early childhood education. Given this particular gap in the Swedish context, this study seeks to contribute to both a new conceptualization as well as a new methodological approach to sustainability in Swedish early childhood education.

2.4. Point of Departure for this Study

As described earlier, the ecological, socially critical and agency/empowerment strands have been identified as the most common approaches in the field. These research orientations tend to address human characteristics, focusing on the learning child, its knowledge and its agency. As indicated in the previous section, it is possible to see that the earlier research strands tend to have some biases, preferences and directions that are, albeit useful in their time, are omitting other perspectives that, given the current sustainability challenges, seem to have merit and are worthy of further exploration. Most of the aforementioned research in the three strands unintentionally reiterates the nature-culture divide, by separating humans and their activities from the rest of the world (Lenz Taguchi 2010; Taylor 2013). Thus, they fall short when it comes to acknowledging the agency and intelligibility of the more-than-human world. Consequently, their theoretical and philosophical orientations do not disrupt

EARLIER AND EMERGENT RESEARCH

the privileging of the human and the underlying humanist epistemological assumption.

A dominant characteristic of these earlier studies is their tendency to emphasize the cultures of human meaning-making and agencies, and to overlook what might be learnt with/from non-human agents. Hence, the ontological, and epistemological underpinnings of these studies remain human-centered. The human-centered bias in ECE-research, calls for different, alternative and broader theoretical orientations, especially when considering the challenges posed by realizing a more sustainable world. It is this gap or 'blind spot' that this study wants to empirically illuminate within the field of ECEfS. Besides exploring new theories, there is also a need for a broadening of methodological perspectives that can overcome the methodological limitations that underlies many of the earlier approaches to sustainability in the aforementioned research strands.

As a response to this prevailing discourse, I point out the limits and inadequacies of the practices within the existing body of knowledge and its anthropocentric narrative. Subsequently, I argue for the need to change our underlying way of being, thinking and living, which in turn can help re-shape our conceptualization of and our approach to sustainability education and the way it is researched. Current dominant knowledge within ECEfS is grounded in the notion of children's agency and it largely neglects the role of non-human factors in the children's learning for sustainability. Furthermore, non-humans (animals, objects and material forces) are usually considered as something to be used as instruments, not as actors.

However, as indicated in this review, it should be noted that this study is not the first one to approach sustainability from a posthuman perspective. There is a small emergent strand of research that employs contemporary learning theories, posthumanism in particular, and investigates the relationship between human and non-human from a non-anthropocentric point of view (Cutter-Mackenzie et al., 2019; Reinertsen, 2016; Somerville and Green, 2015; Taylor, 2017; and Taylor & Pacini-Ketchabaw, 2018). Despite the few existing conceptual studies, the post-anthropocentric approach to sustainability has not been widely applied in empirical studies. It is within this emergent strand of research that I am empirically exploring a post-anthropocentric way of understanding sustainability in early childhood education. In doing so, I employ specific posthuman concepts to uncover and address the blind spots of earlier conceptualizations and theorizations of ECEfS. By doing so, I question the

notion of subjectivity, agency and what it means to be human, but also prevailing norms about childhood and learning in ECEFS.

So, by building on emerging posthuman thinking, I investigate whether a post-anthropocentric perspective indeed presents a comprehensive context which can offer alternative ways of looking at sustainability within ECEFS. Joining these emerging posthuman initiatives, and following the recommendation by Somerville and Williams (2015) to explore the potential of post-humanism for researching planetary sustainability, I argue for the greater use of this perspective as an important theoretical/ philosophical lens for rethinking methodologies and methods when addressing research, pedagogy and curricular endeavours within ECEFS. In doing so, I strive to pay attention to the ontological and epistemological multiplicities that posthumanism offers and attempt to engage with the agency of non-humans, and to explore how such an endeavor contributes to a reconceptualization of sustainability. In that, I employ a post-qualitative inquiry approach that calls for an ontological, epistemological and axiological shift that allows for a non-anthropocentric understanding of the world.

The next chapter discusses concepts and illuminates how they help and enable me to conceptualize sustainability from a post-anthropocentric perspective.

Chapter Three: A Post-anthropocentric Conceptualization of Early Childhood Education for Sustainability

This chapter presents the conceptual premises of the dissertation, i.e. the post-anthropocentric conceptualisation of Early Childhood Education for Sustainability (ECEfS). It begins by describing the early signs of a post-anthropocentric turn in education in general and in early childhood education in particular. This is followed by a discussion of the notion of “assemblage” which, in this dissertation, is employed as an overarching concept to challenge child-centric thinking in order to open up possibilities for ontological and epistemological multiplicity. While assemblage is used as an overarching concept, other subsumed concepts such as subjectivity, agency, becoming and affect are also discussed.

3.1. The post-anthropocentric turn

Post-anthropocentric thinking emanates from the challenge and critique posed to the anthropocentrism of poststructural thinking by the posthuman turn (posthumanism), the material turn (new materialism) and the animal turn (Taylor, 2018). These three concepts, which are not mutually exclusive to one another, extend and deepen understandings of children’s subjectivity, their agency and their becomings. Since this dissertation is situated around the first two turns I will briefly describe both.

Posthumanism, by and large, seeks to reposition the human subject within a web of other non-human actors/agents. Although there are various branches of posthumanism, one of its important tenets is to challenge human exceptionalism in order to become aware of, problematize and, ultimately, avoid (as much as possible), anthropocentrism and species hierarchy (Braidotti, 2013). Posthumanism accepts the premise of critiquing transcendent explanations of human existence, but it decentres and redefines the human as a

part of (not separate from) the natural world, other species, technologies and other materialities. It challenges the longstanding idea of looking at the human subject as an exceptional and political agent, and considers the privileging of the individual human subject to be highly problematic, especially when confronted with those political problems that affect the human subject's very identity and anthropocentric actions (Braidotti, 2013; Poe, 2011).

Parallel to posthumanism, new materialism refutes the idea of considering matter and the material world as passive and inert entities to be perceived only by an active and agentic human subject. Instead, new materialist scholars argue that subjectivity is not limited to conscious subjects such as the human, but also recognize the subjectivity, vitality and responsiveness of unconscious subjects such as matter and the material world at large (Bennett, 2010). It recognizes the potentiality in an object/matter itself, which is not always identified and represented by humans and language. As such, a new materialist perspective advocates a monistic and entangled position where the human is enmeshed within the material world which encompasses humans and non-human forces.

Both posthumanism and new materialism promote the notion of humans as embedded within a more-than-human network or an assemblage (Deleuze and Guattari, 1987), and not alone as a sole agentic force in the world. From this notion flows the need to rethink agency and subjectivity, which ultimately reposition the human within a complex relationship with the non-human world. Hence, I draw on the significant commonality of posthumanism and new materialism perspectives in critiquing anthropocentric humanism to address sustainability in early childhood education (ECE) beyond its anthropocentric limitations.

Many scholars have criticized anthropocentric learning for its isolation of humanity from other realities and the rest of cosmic energy (Braidotti, 2013). These scholars argue for the need to recognize various ways of post-anthropocentric thinking. For instance, Braidotti (2013) advocates a vital materialism that identifies the whole of the universe as one infinite and indivisible substance. Likewise, Bennett (2010) introduces the concept of vital materiality and argues that things and objects are not just passive entities, but rather vibrant and agentic. McKenzie & Bieler (2016) and Poe (2011) highlight how humanity disregards the agency of the non-human, and in turn continue to dominate over the environment and other entities to continue as the Earth falters. Thus, post-anthropocentric thinking promotes the ontological multiplicity that precedes the constituency of subjects and actors.

In ECE, anthropocentrism has also been challenged from various perspectives. For instance, Lenz Taguchi (2009) highlights the need to rethink pedagogy and introduced the notion of intra-active pedagogy, while Clark (2012), MacRae (2012), Pacini-Ketchabaw et al. (2016) used new materialist thinking for re-theorizing arts education. Rautio and Winston (2015) challenge the conventional discursive aspects of children's learning and argue for the need to consider materiality. Hackett and Somerville (2017) employ new materialist thinking in order to decentre the human in their concern for planetary wellbeing. Moreover, Malone (2015) and Nxumalo and Cedillo (2017) have challenged anthropocentric ways of engaging with nature and the environment. Likewise, scholars within so-called 'commonworld' collectives (Pacini-Ketchabaw et al., 2016; Pacini-Ketchabaw and Taylor, 2016) have been challenging anthropocentrism by employing, what they refer to as, multispecies thinking which decentres the child and recognizes the agency of the more-than-human world (animals, plants, materials and places) and its entanglement with human life in children's immediate environment. However, these scholars have emphasized that decentring the human/the child is not an easy endeavour and suggested the idea of learning with/from the more-than-human world as a strategy to decentre the human (Pacini-Ketchabaw et al., 2016).

3.2. The ontological and epistemological multiplicity of Assemblage Theory

There are different types of post-anthropocentrism and they all vary in their way and extent of decentring the human. This section discusses one possible way of post-anthropocentric thinking by conceptualizing the notion of assemblage as an overarching concept, i.e. 'a post-anthropocentric perspective' through assemblage thinking. Early childhood education scholars have been employing different concepts from Deleuze and Guattari (1987), thereby introducing a conceptual and ontological shift in research and practice. Some of these concepts include: assemblage, affect, becoming, deterritorialization and immanence-see description of these concepts later in this chapter. Yet, despite their increasing use in early childhood, it should be noted that for Deleuze and Guattari concepts are not necessarily fixed and static entities, but they are in dynamic flux and their meaning might alter in different contexts.

One of the key concepts, encompassing most of the other concepts, which is widely used to challenge anthropocentrism is the notion of assemblage. The

term assemblage, emanating from the French word *agencement*, is a philosophical term introduced by Deleuze and Guattari (1987) with the literal meaning “arrangement”, “connectivity”, “fitting”, “fixing” or “composition”. The term broadly refers to a set of entities gathered in a context with some kind of dynamics that shift (e.g. change of meaning) and produce new affects which creates some impact in the course of the assemblage.

Assemblage provides a framework for analysing social complexity by emphasizing fluidity, exchangeability, and multiple functionalities through entities and their connectivity (Deleuze and Guattari, 1987). Assemblage theory asserts that, within a body (human or non-human), the relationships of component parts are not stable and fixed; they can be displaced and replaced within and among other bodies, thus approaching systems through relations of exteriority (Deleuze and Guattari, 1987; Braidotti, 2006). Assemblages are never fixed but their collective elements are always reconfiguring, transmuting and generative, and hence always do something and produce effects (Deleuze and Guattari, 1987).

Thus, the notion of assemblage assumes the interconnected nature of human and non-human entities and forces. While challenging the notion of agency as a uniquely human attribute, assemblage highlights the mutually constitutive relations between all human and non-human elements. It calls for the notion of relational and distributed agency which further questions human exceptionalism and the idea of the rational human. In doing so, assemblage thinking allows us to consider research within a ‘web of forces, intensities and encounters’ (Braidotti, 2006, p. 41) between human and non-human elements that produce multiple specifying and aggregating affects and effects. Hence, it is used as a thinking tool to help pay attention to humans’ intricate entanglement within more-than-human assemblages, which problematizes anthropocentrism, nature/culture dualism, species hierarchy, and considers more-than-human others as social, agentic and political participants in world-making and becoming with humans (Haraway, 2008).

According to Deleuze and Guattari, assemblages can be of two types: machinic assemblages and collective assemblages of enunciation. Machinic assemblages have to do with materials and social flow while assemblages of enunciation have to do with sign regimes or linguistic structures and language (Deleuze and Guattari, 1987). Both types of assemblages have relevance for this study as the encountered forces, intensities and affects created have social,

material and linguistic (e.g. the utterances from children, teachers and myself as a researcher) aspects.

Within early childhood education, the concept of assemblage offers a tool to break away from an exclusive focus upon the autonomous child and instead takes account of the complexity of relational events that constitute children's lives and produce specific effects. Employing assemblage thinking has allowed several posthuman researchers in ECE to critique and challenge the well-established child-centric approach which focuses on the child's meaning-making practices and subject formation. For instance, Taylor and Pacini-Ketchabaw (2015) argue for a shift away from child-centred developmental and environmental pedagogies toward pedagogies that bring attention to children's entanglements within multiple human and more-than-human assemblages/relations. Hence, assemblage provides a useful theoretical tool to decentre the human child and to see the world without being constrained by an anthropocentric view, instead opening up alternative ontological perspectives that might be generative in moving towards more sustainable human ways of being in the world.

An assumption underlying this dissertation is that assemblage thinking extends and deepens understandings of children's becomings. How these interrelated concepts (subjectivity, agency, affect and becoming) provide a stimulus for rethinking the ontological and epistemological conditions underpinning sustainability education, will be discussed next.

3.2.1 A Post-anthropocentric Conceptualisation of Subjectivity and Agency

Historically a *subject* is understood as a doer of an action, which mostly signifies it as proprietary to the human. However, posthumanism and post-anthropocentric thinking unsettles and challenges established ways of being as a subject and instead opens up new and generative possibilities of subjectivities. Drawing on the work of Deleuze, Braidotti (2002) refers to subjectivity as 'an assemblage of flows of desire and affect of varying speeds and intensities, not bounded but constituted in relation to other human and nonhuman subjects, spaces, times, surfaces and events.....a subject is always 'non-unitary' and 'inhabits a time that is the active tense of continuous becoming' (p. 62). Likewise, Olsson (2009) points out that from a post-humanist point of view, subjectivity is not confined to the individual child, but instead it remains open

and refers to a collective and connected affective assemblage of other bodies, matter and things. Additionally, Kuby et al. (2018) stated that human beings are multiplicities, relational, embedded, always already material-discursive, co-evolutionary with other species, affected by pre-conscious and non-volitional forces, and thoroughly entangled with materials and technologies. While making the distinction between human and posthuman subject, Kuby et al. (2018) stated that while “the humanist subject sought to control the environment from outside, the posthumanist subject finds itself immersed in a network of vital relations, not autonomous, yet autopoietic, reproducing and transforming in relation to assemblages of which she is part” (p.185). Moreover, Mazzei highlighted that subjectivity is never an individual affair; rather, it is a “process of couplings and connections of different bodies, places, spaces, times, utterances and becomings” (2016, p.154).

Drawing on the above conceptualization and thinking with assemblage, a subject does not exist in isolation, but it is constituted within the assemblage dynamics. Therefore, from a post-anthropocentric perspective, instead of asking what or who the subject is, it is more relevant to ask: under what conditions do we become subjects? Put differently, subjectivity becomes a relative concept because it does not stand alone. As it calls for the decentring of the human, one cannot just stick with a subject or subjectivity, but rather an intersubjectivity and intrasubjectivity is called for. In doing so, post-anthropocentric thinking challenges the liberal human subject and urges a shift from the notion of an independent isolated individual to a co-existing relational being.

Agency is another key concept that is often discussed together with subjectivity. Different scholars within the posthumanist and new materialist landscape, describe agency in different, but overlapping manner. For instance, Alaimo (2017a) defined agency as “the ability to act in such a way as to produce particular results” (Alaimo, 2017a, p.415). It is not something that only humans’ possess, but rather emerges in a relationship (Bennett, 2010). As pointed out by Cielemecka & Daigle (2019), “all beings have the capacity to act, to impact others, even if they may not be exercising a willful agency like the human that, for example, decides to pluck a flower and offer it to a loved one and carries through its intention”(p.7). Barad (2007) describe agency as “a matter of intra-acting; it is an enactment, not something that someone or something has....Agency is “doing” in its intra-activity...Agency is about changing

possibilities of change entailed in reconfiguring material-discursive apparatus of bodily production”(p.178).

From the aforementioned description, agency is not an entity that is bound to an intentional subject, but is diffused across multiple entities and achieves its capacity within assemblages. It is fundamentally understood as a porous, relational, inclusive and distributed/collective entity. Thus, from a post-anthropocentric perspective, it is relevant to talk about what happens to agency or who/what becomes agentic in a given situation or context instead of who or what an agent is. However, it should be noted that a non-anthropocentric reconceptualization of agency does not absolve human responsibility. It simply challenges the “vertical or dualist ontologies” in an effort to “pave the way for a more eco-centric environmentalism” (Coole, 2013, p.461) and encourage “an enlarged sense of inter-connection between self and others, including the non-human or ‘earth’ others” (Braidotti, 2010, p.47).

Such a rethinking of subjectivity and agency opens up possibilities and has allowed me to look at the notion of ‘sustainability’ beyond the discursive level and expand it to ontological multiplicities of vital materialities and forces, affective becomings, encounters and relationships. This in turn paves the way to interrogate and re-conceptualize what ‘becoming sustainable’, ‘sustainable becomings’ or ‘learning for sustainability’ would mean in early childhood education.

While arguing for the agency and vitality of matter, Jane Bennett offers a critique of the traditional understanding which considers non-living matter as passive and lifeless entities that simply await and receive action and direction from agentic and rational humans (Bennett, 2010). In doing so, she introduces the notion of vital materiality which recognizes the vital and agentic characteristics of forces and matter. Vitality refers to “the capacity of things - water, storms, land, flora, fauna, and the elementals in all their permutations to impede or block the will and designs of humans to act as agents with forces, intentionalities, propensities or tendencies of their own” (Bennett, 2010, p.2). Thus, Bennett argues that non-living materials are vital and lively and have the power to act, to create affect and effect, to alter the course of events, and hence to make a difference in the world. Bennett borrows and builds on Latour’s notion of actant to characterize the vitality and agentic characteristic of non-living matter. An actant refers to “something that acts or to which activity is granted by another...an actant can literally be anything provided it is granted to be the source of action” (Latour, 1996, p.373). Yet, the limitation of Bennett’s

above definition of vitality is that she merged all the non-humans (including animals and plants) into one whole thing, which is not in line with my post-anthropocentric stance in this dissertation.

Bennett points out that vital materiality is not within each separate actant, but is rather a relational ‘swarm of vitalities at play’ (2010, 32). The agency is distributed and it swarms, or intensifies when things, forces, or materialities come together within an assemblage. Bennett explains that all actants within the swarm are agentic, with their own unique efficacy, trajectory and causality. Efficacy refers to “the creativity of agency, to a capacity to make something new appear or occur” (ibid., 31). “A body’s efficacy or agency always depends on the collaboration, cooperation, or interactive interferences of many bodies and forces” (ibid., 21). Trajectory refers to an agent’s “directionality or movement away from somewhere even if the toward-which it moves is obscure or even absent” (ibid., 32), and causality refers to the “contingent coming together of a set of elements” (ibid., 34).

Again, drawing on Deleuze and Guattari and Latour’s notion of assemblage, Bennett introduces the notion of “agency of the assemblage” (ibid., 20), which sees agency beyond the moral human subject and highlights its distributive nature across a swarm of simultaneous actants and vital materialities. Hence, Bennett’s notion of agency “does not posit a moral subject as the root cause of an effect” (ibid., 31), but rather a collection of actants within a lively assemblage. She defines an assemblage as “an ad hoc grouping of diverse elements, of vibrant materials of all sorts” which helps us to understand agency “as a confederation of human and nonhuman elements” (ibid., 23). She argues that we humans are in an inextricable enmeshment with these webs of forces that she refers to as an assemblage.

For Bennett, assemblages are constituted of affective bodies, which she describes as “associative bodies within an assemblage which are continuously affecting and being affected by other bodies while entering a relationship, an assemblage” (ibid., 21). She argues that “the more kinds of bodies with which a body can affiliate, the better. As the body is more capable of being affected in many ways and of affecting external bodies...so the mind is more capable of thinking. Therefore, bodies enhance their power in or as a heterogeneous assemblage” (ibid., 23). The notion of affective bodies has urged me, in the third paper of this dissertation, to look into the affect created within weather-child assemblages and the thinking it might provoke.

Along with subjectivity and agency, the notion of *affect* and *becoming* are key concepts that are concurrently discussed within assemblage thinking. The concept of affect has been described in different ways by various theorists. Drawing on Spinoza, Massumi (1987) refers it as body's (of humans' and non-humans') capacity to act or be acted upon. According to this description, how a practice may enhance or diminish a body's capacity or power to act or be acted on is dependent on its affective characteristics. Likewise, Deleuze & Guattari (1987), drawing on Spinoza, describe an affect as an action or force that operates at the moment of contact of a body to another body (human and non-human bodies). Put differently, Deleuze and Guattari (1987) describe affect as a becoming, a pre-personal and inorganic force that drives transformative movements of becoming through the power "to affect and be affected" (p. 261). While Barad (2007) conceptualizes affect as a phenomenon, Braidotti calls it a force for "successive waves of becoming" (2013, P.136). Although there seems to be a slight difference in the conceptualisation of affect, the aforementioned descriptions commonly point to a certain characteristics of vitality, movement, persistence and change.

Affect theory allows for posthumanism to highlight the "non-cognitive and non-volitional expression of life, including feeling, animation, tactility and habituation" (Roelvink & Zolkos, 2015, p.1). In doing so, the concept of affect serves to draw attention to what moves us, that is, to relations in which the children either expand or restrict their capacity to act and respond. In this dissertation, affect is conceptualized as it occurs through relationships of bodies (of human and non-humans) in Article III and through events and performance in Article IV.

Parallel with affect, *human becomings* occur within relational assemblages of heterogeneous elements which might include: objects, other living bodies, affects, practices and semiotics (Deleuze and Guattari, 1987). Ferrante and Sartori (2016) also argue that "human identity is an impure product derived from an ongoing miscegenation and contamination with the non-human, which entails that human beings become such only through a process of hybridization with the environment, as well as with those forms of otherness that inhabit it, which can be considered as co-evolutionary partners" (P.177). In line with this, Haraway (2008) pointed out that 'to be one is always to become with many' (p. 4).

In early childhood education, unlike the developmental psychologist's understanding of the child as one who is heading to become a mature and

rational adult, the posthuman becoming is understood as a desire-driven and relational way of being with the more-than-human world (Taylor, 2017). The concept of becoming entails a relational, open-ended, transformative, fluid and affective way of approaching children's subjectivities and modes of being through which children relate to other species, non-human forces and move through the world around them (Olsson, 2009; Lenz Taguchi, 2014). It challenges the developmentalist assumption which views the child as a unified individual subject and primary unit of study. Thus, children's subjectivity and becoming is continuous and emergent from their relations (embodied, affective) with the more-than-human world around them (Davies, 2014; Somerville, 2011). Children's relations with the weather (embodied relations) and the bees (affective relations) are empirically explored in Articles III and IV of this dissertation. Thus, children's subjectivities emerge through 'becoming worldly with' (Giugni, 2011).

3.3. Anchoring Concepts with the Empirical Work

In this dissertation, two (Articles III and IV) of the four articles empirically investigate post-anthropocentric analysis of sustainability. Article III addresses possibilities of engaging with ecological (e.g. climate) issues by engaging with materialities of the weather. Article IV indicates alternative ways of engaging with species extinction issues through becoming-with animals, bees in particular. In doing so, the concept of agency, affect, becoming and subjectivity are employed. It should be noted that these concepts are inextricably intertwined and reinforce one another. The following paragraphs describe how these concepts are empirically put to work in article III and article IV of this dissertation.

Thinking through the intersection between the weather and Bennett's notion of vitality and lively assemblages, in Article III, I have extended and reconceptualized the ongoing child-weather relationships at the preschool. In doing so, I see weather as a constitutive vital force acting within human-non human assemblage (Bennett 2010). This conceptualization allows me to see child-weather relationships beyond the limits of anthropocentrism (only ever thinking about the agentic child), but rather enmeshed within lively assemblages. Besides, Bennett has reminded us that whether we recognize and

experience it or not, the force of matter (e.g. the weather) exists regardless, and can and will thwart human intentional agency.

Haraway's notion of "becoming WITH others" has been particularly useful in article IV as she is concerned about real-life multi-species relations (Haraway, 2008), which has an implication for sustainability. The notion of becoming WITH suggests a relational being in the world that is both present and emergent at the same time. As such, being and becoming are relational as a result of relations that are formed, maintained and lost in an assemblage constituted of vital materialities and the agency, subjectivity and affect they generate.

Haraway is concerned about actual human-animal relations, which is more relevant to the situation of the dying bees in Article IV of this dissertation and to sustainability education at large. Although real bees are not part of the theatrical assemblage, it is designed based upon real bee behaviours with pedagogical intent. Moreover, real bees joined the assemblage at a later stage of the becoming-with process, which makes Haraway more relevant here although her concept of becoming-with builds on Deleuze and Guattari who originally introduced the term.

In Article IV, Haraway's (2008) concept of 'becoming-with' as a practice of 'becoming worldly' (p. 3) has helped me rethink humanness and experience "bee-ness". Haraway points out that being human is inextricably tied to 'becoming with' multi-species others. Haraway specifically writes about political 'becoming with' in cross-species relations, i.e. becoming-other of humans. While working with Haraway's notion of becoming-with, Giugni (2011) highlights that 'cross-species relational entanglements are useful to transgress all kinds of "borders" of "self", "other", spaces, places, languages, politics, pedagogies in new ways' (p. 12). By highlighting the entangled world we live in and share with multiple other species, Haraway's (2008) notion of becoming-with captures the relationality and interdependence between humans and non-humans, which could have significant implications for sustainability education. Humans and non-humans (e.g. animals) share agency and become together while influencing each other. As much as what humans do matters and affects the bees, what the bees do also matters and affects humans. Hence, the theatrical performance of the child-bee assemblage helps make the entanglement explicit.

In her book, 'When Species Meet', highlighting her relationship with her dog, she emphasizes the need to think deeply and take seriously "our" relationship, entanglement and encounter with other species, which has a

potential for the “redoing” of each other (Haraway, 2008). She argues that to be a human is always to be in a relationship with a host of others: plants, animals, humans, dead, living, and to be on earth is to be in a companion-species relationship in the sense of coming into being with a crowd of others, and in the sense that we shape and reshape each other into what we are (Haraway, 2008; 2016). She calls for a rethinking of our perspective towards being in tune with both history and the tangled complexities of now. Doing so will force us to be aware of many things and might make us more responsible, ethical, connected, ecological, and sustainable (Haraway, 2016). Likewise, her relational ‘worldly’ ethics foregrounds the ways in which human lives are discursively and materially entangled with other species, multispecies co-existence (Haraway, 2008).

Haraway argues that these new ways of thinking, which involve others and our entanglement with others, will help humans affectively embrace the challenges of the 21st century better. Among the questions she poses are the following: how can we live better and beyond the nature-culture binary, with the unfolding relational and entangled worlds with other critters? (Haraway, 2008).

In Article IV, I employ Haraway’s concept of becoming-with by analysing the theatrical performance of a child-bee assemblage. The assemblage enacts the collective agency of bee-ness where children are performing ‘becoming-bee’ and enacting ‘bee collective agency.’ The theatre invites the children: to become bee-like, to try out bee behaviour, and enact bee concerns. The theatrical assemblage is constituted of: actors (in bee suits), a bee set and props, children-becoming-bee-like, and an ecological narrative about bee pollination. In doing so, the theatre captures the urgency and what is at stake within the temporality of the created space (see Article IV). However, it should be noted that Haraway has not paid appropriate attention to power asymmetries in her “multispecies” analyses.

In this chapter, I have introduced the key concepts in the dissertation which include: assemblage, agency, subjectivity, affect and becoming. The concepts used and perspective taken also has methodological consequences. These methodological implications will be discussed in the next chapter.

Chapter Four: Methodology and Nature of Inquiry

This PhD dissertation is composed of four studies. Each study addresses different questions, and the nature of each question drives the methodology and associated methods employed. The methodology section is organized into two different major parts: the interpretive hermeneutical part and the post-qualitative part. The focus on new, or rather alternative, ontological perspectives in ECE in relation to emergent sustainability questions, called for a research design that allowed for adaptation of the guiding of questions as the research unfolded. Indeed, the nature of questions shifted during the course of the research, as did the methodological approach used to investigate them. With the shift in the nature of the questions, the methodology shifted from an interpretative descriptive one (the world can be analyzed, interpreted and described) towards a one that precludes initial framing and interpretation to allow for immanence and emergence. Such an approach strives to be methodology-free which indeed might seem impossible, but as will be elaborated in 4.2, post-qualitative inquiry “encourages concrete, practical experimentation and the creation of the not yet instead of the repetition of what is” (St. Pierre, 2018, p.1).

4.1. Interpretive descriptive component of the study

The first part, which covers the first two studies, is of an interpretive descriptive nature. Study one (which engages with the conceptualization of sustainability) constitutes a systematic literature review of the history, policy and research within Early Childhood Education for Sustainability (ECEfS). Study Two, which explores curricular manifestation of sustainability within early childhood education, is a content analysis of national curricula. Studies Three and Four draw on post-qualitative ideas.

4.1.1. Systematic Literature Review

The first theoretical study is a systematic literature review that examines the notion of sustainability within early childhood education from a posthumanist and new-materialist perspective. In a broader sense, a systematic literature review is a method to review relevant literature in a particular field through a systematic process. Fink (2005) describes a systematic literature review as a systematic, explicit, comprehensive and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners. Systematic review involves examination of contents in the field using certain methods and criteria. It requires an a priori specification of the review question, the methods of searching, methods of quality appraisal and methods of synthesis (Silverman, 2011).

Highlighting its benefits, Webster and Watson (2002) indicate that a systematic literature review "...creates a firm foundation for advancing knowledge... facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed" (p8). The main purpose of this systematic review was to engage and familiarize myself with the field and to develop an overall understanding of the conceptualisation of sustainability in the history, policy and research activities within the field of ECEfS.

Accordingly, the review provides an overview of the current state of the art and prevailing research discourses within ECEfS and briefly summarises the content of the available publications and policy documents in the field from 1996 (earliest traced) onwards. While searching for publications, key terms such as: childhood and sustainability; early childhood and environmental education, early childhood and ESD, and early childhood education for sustainability were used to search for articles, books, book chapters, special issues, review articles, research collectives and policy reports within different databases which included: Scopus, ERIC, Web of Science and Google Scholar. Moreover, cross referencing and hand searching of key journals and policy documents were employed as part of the searching strategy.

Although this search generated quite a number of references, specific inclusion criteria were employed to obtain the most relevant ones for analysis. These criteria were: 1) the material had an educational aspect, i.e. is published within educational studies or a related field; 2) the material focused on early

childhood education, i.e. 0-8 years, and 3) the material also focused on the environmental aspect of sustainability, and hence should address nature and environmental issues. The search was made within the field of environmental education research, early childhood research and sustainability research.

While laying the foundation for my empirical research, the systematic review broadened my understanding of how sustainability is conceptualized within ECEfS. The review helped me identify what is done, how the history evolved over time, what pertinent policies in the field exist, what theory and method are used and what conceptualizations are made. This in turn elucidated a limitation in underpinning ontological and epistemological assumptions within ECEfS, which serves as a backdrop, and paves the way, for the empirical part of the dissertation—Articles III and IV. This has helped me build a knowledge base which lends itself to generating an alternative conceptualization of sustainability within ECE, but also enabled me to develop an appropriate form of methodological inquiry for the empirical part of the dissertation.

4.1.2. Curricula Content Analysis

After obtaining a better understanding of the historical development of the field of ECEfS and of the conceptualization of sustainability, the next step was to look into current scenarios of how sustainability is enacted in practice. As curricula are critical documents that govern practice, examining current curricula seemed to be a sensible step towards understanding the manifestations of sustainability in practice. Accordingly, the second study in this dissertation endeavours to form a content analysis of five early childhood curricular documents, addressing the question of how sustainability is embraced and integrated in the documents.

The purpose of the content analysis is to provide an overall picture of curricular manifestation of sustainability within early childhood curricula. Content analysis is “a research technique for making replicable and valid inferences from data to their context” (Krippendorff, 1980, p. 21). Content analysis is chosen as it offers the opportunity to answer questions directly related to the materials analysed through simple classification or tabulation of specific information (Borg and Gall, 1989).

With the intention of broadening the scope and coverage, I organized and led a group of international scholars with a similar research interest. An opportunity at my disposal was the Transnational Dialogues for Sustainability

Research in Early Childhood Education research group, which is an international research group of which I have been a member since 2014. In one of our meetings, I proposed a possible collaboration for comparative study. Six members of the team, from four different countries, accepted my proposal to engage in a cross-national study and dialogue on how sustainability is manifested in ECE curricula frameworks. This led to the formation of a group with seven scholars representing five different countries: Australia, England, Norway, Sweden and the USA.

Since content analysis does not necessarily require the physical presence of the collaborating researchers, it has become a suitable method for a long distance collaboration endeavour. The joint force among international authors allowed the possibility of collaborative inquiry to conduct a comparative content analysis of the 5 early childhood national curricula based on four criteria: sustainability presence, views of the child, human-environment relationship, and philosophical/theoretical underpinnings on ideas expressed about sustainability.

The group pursued the project by collecting data within a table using a collaborative file-hosting service (Dropbox). The table and the ensuing bodies of text were scripted through an online word processor (Google Docs). This community of practice (Lave and Wenger, 1991) was further enhanced by face-to-face meetings in Boston, USA, in September 2016. The analyses were guided by critical inquiry using a posthumanist framework as a backdrop. Critical inquiry is a dialectical process involving the comparative weighing of a variety of positions and arguments, while argumentation is seen as a way of arriving at reasoned judgements on complex issues (Battersby and Bailin, 2011). The posthumanist framework is mainly utilized to look into the human-environment relationship and how it is manifested in the curricula.

At first, the primary investigation of the individual early years' curriculum was conducted by each author–researcher in their home country. Each author drew on local knowledge and experience, thus enhancing the grounding of the investigation. This was followed by successive discussion amongst the research team which resulted in the identification of the four curricular aspects on which to focus in order to guide the comparative analysis. In addition, we (the researchers/authors) shared the “coding frame” (Silverman, 2011, p. 65) during the data collection and analysis processes through completion of an evolving “running” table with the commonly identified four curricular aspects of sustainability: sustainability presence, views of the child, human-environment

relationship, and philosophical/theoretical underpinnings on ideas expressed about sustainability. While focusing on the identified four aspects of the curricula, an inductive thematic analysis (Guest et al., 2012) was employed. As the process developed, the interplay between individual and group reflection was conducted through dialogues (Bray et al., 2000) which sometimes led to a rethinking of our own knowledge and understanding of our “home” curriculum frameworks. For a meaningful exemplification and elucidation of curricular characteristics, various excerpts are quoted in the findings section. See details of the methodology in Article II.

4.2. Post-Qualitative Inquiry

The second methodological part, which comprises the latter two empirical studies, addresses the post-qualitative aspect of the dissertation. Studies Three and Four have a similar underlying question, and both seek a post-anthropocentric analysis and conceptualization of sustainability. To make this possible, a methodological shift towards post-qualitative inquiry was realized. This section has two sub-sections. The first sub-section offers an overall description of the essence and characteristics of post-qualitative inquiry. The second sub-section offers two examples of post-qualitative inquiries, which draw ideas from Nordstrom’s (2015) concept of data assemblage.

4.2.1. Characteristics of Post-Qualitative Inquiry

Post-qualitative inquiry emerges as a critique of the conventional humanist qualitative study (language and interview based) and aims to think, and do, educational inquiry outside normalized structures of humanist epistemology, ontology, and methodology (St. Pierre, 2015). Ontology refers to ‘claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other. In short, ontological assumptions are concerned with what we believe constitutes social reality’ (Blaikie, 2000, p. 8). Likewise, Blaikie (2000) describes epistemology as ‘the possible ways of gaining knowledge of social reality, whatever it is understood to be. In short, claims about how what is assumed to exist can be known’ (p.8).

Post-qualitative inquiry works with an ontology of immanence (Deleuze and Guattari, 1987) which challenges and denies the popular dominance of the signified and refutes the language that is so often seen as immutable.

Immanence ontology rather calls for a horizontal relationship/entanglement that entails embeddedness, immersion and connection from within. As St.Pierre (2018:4) puts it “in an ontology of immanence, one becomes less interested in what is and more interested in what might be and what is coming into being”. Thinking with immanence implies that data is not out there to be collected. It is everywhere but indeterminate, not yet created, not yet individuated and organized into the definite. It is the not yet, the yet to come characteristics of data that marks post qualitative inquiry (St.Pierre, 2018).

In post-qualitative inquiry, “the practices of knowing and being are not isolatable, but rather they are mutually implicated” (Barad, 2007, pp.829). Barad’s notion of “ethico-onto-epistem-ology (p. 90)” points out the inseparability of ethics, ontology and epistemology when engaging in (scientific) knowledge production, with scientific practices, and with the world itself and its inhabitants-human and non-human beings that intra-actively co-constitute the world (Barad, 2007). Barad (2003) argues that that the practices of knowing cannot be fully claimed as human practices, not simply because we use non-humans elements in our practices but because knowing is a matter of the world making itself intelligible in relation to another part.

A central idea in post-qualitative inquiry is to highlight the integral role that theory, concepts and philosophy play in governing research activity, as opposed to letting research be driven by method and methodology. For post-qualitative researchers, theory is the driver of their inquiry and method is kept in the periphery (Lather, 2012; St. Pierre, 2015). Post-qualitative researchers strongly stresses the importance of theory and argue that researchers need to become engaged in thinking with theory and spend more time in reading theory than being dictated to by rigid methodology (St.Pierre, 2015).They claim that concepts allow researchers to experimentally engage with the world and think with data as opposed to gathering pre-existing data (Lather, 2012; Lather & St.Pierre, 2013). Thus, post-qualitative research doesn’t have a pre-existing method and practice to be applied.

One important difference between post-qualitative inquiries and more traditional/conventional methodologies is its underpinning ontological assumption. The former are based on empiricism while the latter are based on rationalism (Lather, 2009; Lather & St.Pierre, 2013). By acknowledging radical empiricism emerging with the ontological and material turns, post-qualitative researchers challenge the ontological standpoint that solely relies on a speaking human subject and calls for decentring a pre-existing knowing and agentic

METHODOLOGY AND NATURE OF INQUIRY

human subject. They rather argue that subjects are co-constituted with objects, and data comes to life at the intersection/entanglement of subject and object - what Barad (2007) refers as agential realism.

Proponents of this approach also challenge the adequacy of language in representing knowledge, and argue for researching without representation (MacLure, 2013), for example with the help of affects, intensities and force. Scholars such as St.Pierre (2015), Lather, (2012); MacLure, 2011, 2013) argue that language has become a signifying regime that unwillingly marginalises other forms of empirical and virtual existence and representation. They strongly question whether language can represent everything that happens in the world that we tend to explore in our research. They point out that in order to demystify the hidden or overlooked powers and forces within nonhuman actors, which are intrinsically resistant to representation, one has to work with affects and learn how to be affected (MacLure, 2013; St.Pierre, 2015, 2018). Hence humans as subjects and agents of research are not there in the field to simply observe, act, do, perform, speak or assess but also to be affected by others - the more-than-human intelligence.

A major critique that post-qualitative researchers make of conventional methodologies is that they consider method as a pre-existing structure or pathway that governs and normalizes thinking which produces “minds in a groove” (St.Pierre, 2015). They argue that method is a recipe that closes possibilities instead of opening up multiplicities. They essentially “trap”, control and discipline researchers, which hinders the critical level of their inquiry, and forces them to simply follow a prescribed order of thought and practices (St.Pierre, 2015). Such a *modus operandi* denies the experimental nature of transcendental empiricism (see further explanation below), and makes it difficult, if not impossible, to keep up with events, and prevents them from coming to existence. As St.Pierre (2015) has pointed out, this is why students need to learn more about ontology and epistemology rather than learning how to follow a rigid method. Hence, advocates of post-qualitative inquiry object to forms of method-driven qualitative inquiry which heavily relies on practices of formalization. In the words of Deleuze and Guattari (1987), a method can be conceived of as “a striated space that draws a path that must be followed from one point to another” (p.377). Instead, they suggest a methodology which they call “methodology unfold”, which has later been developed by St. Pierre (2018). As post-qualitative inquiry has no model to be applied, it should be noted that

there is no single specific post-qualitative method. It is rather situated, experimental, emergent and, inevitably and intentionally somewhat vague.

4.2.2 Empiricism and Data in Post-Qualitative Inquiry

Empiricism in a post-qualitative inquiry has a philosophical basis and does not entail a typical empirical experience as in conventional humanist qualitative research. As St.Pierre (2018) puts it, “the image of thought that guides post qualitative inquiry relies on an ontology of immanence and transcendental empiricism (p.4)”. Transcendental empiricism problematizes classical ontology and transcends time and space, i.e. it works with the ontology of immanence.

Such empiricism has been described by various scholars in a more or less similar manner. Drawing on Deleuze’s concept of ‘transcendental’ empiricism (1994:181), Massumi (2002) refers such an empiricism as ‘expanded’ empiricism. Clough (2009:2) calls it ‘infra-empiricism’ and argues that such empiricism embraces forces beyond human conscious perception. Clough (2009) argues that infra-empiricism permits a rethinking of bodies (human and non-human), matter and other non-humans through encounters and affect.

MacLure (2010:2) also used Clough’s concept and argues that infra-empiricism does not privilege human interpretation or conscious perception but it rather ‘attends to affects, forces and movements in bodies, in matter, as well as between individuals and groups’. This is where post-qualitative differs from phenomenological studies which rely on human perception. Phenomenology addresses what is available to human consciousness, but transcendental empiricism goes beyond human’s phenomenological gaze of a lived experience. Infra-empiricism is materially engaged and experimental in nature, and hence, it traces intensities of affect that move and connect bodies physically and culturally (MacLure, 2010).

In post-qualitative research, inquiry and data are not perceived exclusively in connection with methods. Post-qualitative scholars argue that researchers are already entangled with data from the very onset of their project. They claim that researchers’ mundane encounter in everyday life, their reading of the literature, their writing, discussions with family, friends and colleagues are all possible sources forming data (St.Pierre, 2015; MacLure, 2013).

Data emerges in and with more-than-human research assemblages- it does not represent a pre-existing entity to be collected by an outside researcher. One does not collect data, but enters a form of experimental engagement with the

world in an effort to think with data as opposed to gathering a preexisting data (Lather, 2012; Lather & St.Pierre, 2013). Data is co-created with the researcher and the researched and there is no “official” data collection place and time. Thus, taking immanent ontology and transcendental empiricism into account, post-qualitative inquiry is an ongoing process that happens in multiple ways, such as reading, writing, discussing, and thinking, and data might emerge any time along the way (St.Pierre, 2015; Richardson & St.Pierre, 2008).

In this same vein, one avoids procedurally analyzing and coding empirical data with the search for “themes and patterns” to emerge because every data is unique and different. Post-qualitative inquiry opens a room for speculation, and hence everywhere is a potential research site. Viewed as such, a research site is a transcendental field that is limitless and has not yet been actualized into real experience (St.Pierre, 2018). As a result, a post-qualitative inquirer is always empirical and always in the field because the virtual cannot be systematized.

It is also important to understand that post-qualitative inquiry is not one definite method that can be applied. There are countless ways of doing a post-qualitative inquiry. One possible way of carrying out a post-qualitative study is to consider research as an assemblage (Nordstrom, 2015; Nordstrom, 2018; St.Pierre, 2018; Fox & Alldred, 2015) and speculatively search for multiplicity of affective relations in the research process, including the ‘events’ to be encountered and researched. Events to be researched within an assemblage could be any instance of bodies, things, settings, languages/utterances or social formations, or of assemblages of these; research tools such as recording devices, field notes, theoretical frameworks and hypotheses; research literatures and findings from earlier studies; the ‘data’ generated by these methods and techniques; and the researchers themselves (Fox & Alldred, 2018). In particular, this study employs Nordstrom’s (2015) concept of data assemblage which I will discuss in the next sub-section.

4.2.3. Data Assemblage

This sub-section discusses the two post-qualitative empirical studies in Articles III and IV. For both studies, I have employed Nordstrom’s (2015) concept of data assemblage. Nordstrom (2015) states that “Data assemblage is a dynamic onto-epistemological entity in which the constitutive lines open up new ideas of thinking about data in a study and what that data can do and become” (p.166). I will first discuss Article III and then move on to Article IV.

During the process of “data generation”, I spent about 6 months (December 2016 – June 2017) at a preschool following 16 children and three teachers, documenting various encounters forming more-than-human assemblages, and exploring how these formed assemblages could open up possibilities for analysing sustainability issues from a post-anthropocentric perspective. Throughout this period, the inquiry attempted to probe deep into these assemblages, and their implications for sustainability. Video recordings, audio recordings and field notes were used as a tool for capturing children’s, teachers’ and my own encounters and entanglements, and were all combined to form ‘data’. Although the study began with open-ended assemblages (without pre-defining the non-human aspect), the study has been framed around weather and bees as non-human subjects (see Articles III and IV respectively).

Article III discusses the emergence of generative child-weather assemblages. As indicated by St. Pierre (2018, p.9), one way of carrying out a post-qualitative inquiry is to “begin with the fortuitousness of the encounter (not with method) that guarantees the necessity of what it forces us to think”. This particular inquiry began with the data that emerged from my random bodily encounter with a rain shower on a stormy morning, which elicited and lent itself to the emergence of multiple other forms of encounters with elements of the weather. I lingered, immersed in the moment, and began to consciously attend to the encounter, which rhizomatically elicited different forces and weather encounters, which led me to think of “data as an assemblage” (Nordstrom, 2015, p.167) of different forces: some human (children, teachers and myself) and some non-human (different elements of weather, slide/metal, flashcards, weather charts etc.), which can be seen in the vignettes in Article III.

The thinking that started with my own bodily encounter with the rain has opened up different lines of thought, which in turn enabled different materially and discursively generated weather events to enter the data assemblage. The assembled data in this article formed a dynamic line of thought that offered varieties of data (Nordstrom, 2015, 2018). Children’s and teachers’ conversations during the preschool’s calendar routine, the researcher’s reading about weather and several other material and discursive manifestations of the weather, all formed the assemblage. Thus, the concept of data-assemblage allowed me to assemble data from different weather encounters and weather-generated vignettes, which are presented as narrative snapshots of the weathering-child assemblages. The vignettes are analysed and discussed in light of Bennett’s (2010) concepts such as: ‘material vitality’, ‘lively assemblage’,

METHODOLOGY AND NATURE OF INQUIRY

‘distributed agents’, ‘swarms of vitalities’, ‘efficacy’, ‘trajectory’ and ‘causality’ (see Article III for details on this inquiry).

Article IV discusses how my inquiry began with an intelligible random encounter with a theatrical performance of child-bee assemblage that compelled and pressed me to think with the bees. The theatre was hosted by a grocery called COOP and the idea was to create ecological awareness, ideas about organic food and sustainable environmental thinking among children (3–7 years old). We (children, teachers and myself) encountered the theatre during an educational excursion to the grocery. While beginning and thinking with the encounter, I speculated on what might possibly emerge, which St Pierre refers to as the ‘not yet’ (St. Pierre, 2018), rather than articulating what is expected or planned for, as tends to be the case in conventional structured methodology.

While serving as a moment of potentiality, the encounter created an affect that forced me to rethink and feel the threats posed to the bees. The theatre presents a moment portraying humans’ encroachment in the bees’ life through destruction of their habitats. My prior knowledge of the central role bees play in the ecosystem, in the real-world entangled scenario, was activated and urged me to rethink humans’ entanglement with this insect, and the resulting vulnerability. The theatre not only created affect in me, it also affected the children and the teachers, who were captivated and drawn to the bees and their threatened predicament.

Thinking and becoming-with the theatre has elicited different responses, affects and effects in the children’s verbal reactions (discursive responses) and doings (material responses), forming what Nordstrom (2015) refers to as data assemblage. During the weeks and months after the theatre, the children and also the teachers had been repeatedly coming back to the bees every now and then in relation to their everyday pedagogical activities, mundane conversations, outdoor free play, and other instances in the pre-school environment. Various verbal utterances, comments, a song about a flower, bee drawings, bee crafts and a bees’ ‘swimming pool’ also constitute the data assemblage.

In Articles III and IV, Nordstrom’s (2015) data assemblage inquiry approach is chosen to overcome the child-centric/anthropocentric methodological individualism that underlies dominant approaches to sustainability in early childhood education. By doing so, such an approach offers a more comprehensive context that is inclusive of different ways of being and knowing that are typically left out of sustainability and environmental discourse in general and within ECEfS in particular. Thus, drawing on the notion of posthumanism,

the data assemblage has helped me to seek and illuminate relational ways of being in the world and develop a deeper and entangled understanding of interspecies and material connectedness.

Apart from methodological implications, assemblage theory served as an analytical framework for the study. Such analysis shifts attention away from the individual child to the relationships and becomings within the material assemblages of bodies, things, ideas and social institutions, and focuses upon the micropolitics of research and the capacities these assemblages produce (Fox and Alldred, 2015). For Deleuze and Guattari (1987), an assemblage is a machine that links affects together to produce or do something. This perspective has helped me achieve a methodological (analytical) objective by serving as a tool to capture the established interconnectedness and composition and flows of affects. Thus, the research capabilities (such as analytical framework) that are enabled as we consider the human (researcher, children, teacher), the more-than-human (weather, climate, bee) and the research process (field work, audio recording, video recording, pictures) as machines that are plugged into the research assemblage, have served as a unit of analysis for Articles III and IV. As such, the relationalities, the responses and the becomings produced within the assemblage are a central focus of the inquiry.

4.2.4. Researcher's Journey and Experienced Challenges

As stated in the beginning of this chapter, the nature of the research questions evolved during the course of the project, which in turn brought about a methodological shift towards post-qualitative inquiry for article III and IV. Having used Vygotsky's sociocultural theory and conducted interview-based studies in my Master's degree, making this shift was not easy for me. The challenges emanated from four main dimensions: adjusting my own subjectivity and ethical position as a researcher, adopting to conventional dissertation genre, engaging with the supervision team and also factors related to the research setting. I will describe each dimension in the following paragraphs.

One thing that post-qualitative research requires of the inquirer is to feel at ease, have trust in the world and hope for the "new" to emerge. I knew my interest is not what we (I, the children and the adults) think, know or say, but rather how we might be affected by non-human forces, events and other species that are entangled with us. This implies the need to decenter myself, as much

as possible, and not being in the lead position, but instead to assume an honest ‘not knowing’ position so that non-human actors and forces could come into play and act on different human and non-human bodies. Bringing in the humbleness and humility required to research within this new and ethical ecology of things and beings was challenging as it involves: repositioning myself from “researcher” to “researched”, from “knower” to “being affected”, from “knowing” to “becoming-with”, and from “responsible” to “response-able”.

Finding myself into ethical modes of becoming-with and affected by non-human others has been a constant struggle. It took me a while to learn not being preoccupied with the cognitive, but instead to affectively embrace and remain attuned to the agentic forces of the non-human world. As indicated in article three, the agentic force of the weather creates affect in my body. Thus, the attunement to physical encounter with the weather became a pivotal point and agentially changed me, and eventually the research process as well. So, attuning to the emerging lines of thoughts, which had the potential to agentially influence me as a researcher and the entire research process, was challenging. Language has also remained a major source of ethical, ontological and epistemological challenges. English language by default grants agency to human subjects as doers of actions, which contributes to the difficulty to ethically attribute and express the agentic characteristics of other non-human subjects in a written and spoken language.

The second dimension of challenge is in connection to the difficulty to avoid the hegemonic dissertation genre pertaining to methodology and theory. I struggled while framing the methodology section of the research proposal during the first planning seminar, which is mainly meant for examining and approving the overall research plan. As I was in the early stage of the project development, I was not completely certain on how to frame and “label” the methodology part of the proposal. In an effort to be obedient to what post-qualitative inquiry demands, I emphasized on the concepts (assemblage, affect, becoming-with, and agency) that guide my inquiry and left the “application” aspect somehow open-ended. As, St. Pierre (2018) argues there is, in fact, nothing to be applied in post-qualitative study, but instead to experimentally engage with the world. Additionally, the combination of “conventional qualitative” (systematic review and content analysis) and post-qualitative, contributes to the challenge in structuring the dissertation (e.g. theory-method invisibility) and creating the required command of language. As a result,

adopting to the hegemonic dissertation genre has remained a challenge through the writing process.

On top of that, there was an expectation and demand from supervisors and the discussant to have a methodological rigour. Some of the comments from my supervisors include: “the methodology section is a bit fussy and it will need strengthening-will you work more inductively or deductively or both-that could be clearer”. “How are you going to organize and analyze the data? Are you going to code and look for patterns and categorize data thematically?”. “You cannot leave the methodology open like this-be specific and state what you observe, the number of visits (months/weeks) and hours you will be at the preschool for data collection”.

These comments put me in dilemma of being either methodologically rigorous, thorough, logical, systematic, objective and ensure its validity and reliability or still have the trust and remain curious of what sort of affect and encounter might emerge while thinking with the concepts. This dilemma also inflicted a sort of fear and insecurity of not getting approval as it might be viewed as “unclear” or not “well thought out” project. This in turn led me wrestle with the balance between the formalization and the theorization aspect of the research development process.

The fourth confrontational point was during the fieldwork at the preschool. The preschool management asked me to write some brief information about myself, my research and what I intended to do during my stay at the preschool. I knew I had to be as clear as possible, and struggled a lot to find the “right” language that clarify my post-anthropocentric interest and the non-human world that I aspire to deal with, and also where to position the children in my description.

When I started the field work, I made a general introduction about my topic, research questions and some insights about the theory. I told the teachers (and also stated in the consent letter) that I will be at the preschool 2-3 times a week for a couple of hours for about six months. We agreed on that and the journey began. During the school visit, I simply availed myself and followed the flow of their everyday pedagogy. I went to the school with my field note book, a dictaphone and a video camera without knowing what to encounter, yet with the hope that something would emerge.

The teachers were not at ease seeing me there and simply following them without being proactive, lead, provoke and ask questions. After a couple of weeks, the teachers started posing questions to me: “what exactly are you

METHODOLOGY AND NATURE OF INQUIRY

observing, do you want to talk to/interview the children, perhaps in a smaller group? Or maybe one on one?" At this point, I was unsure of how much I could open up and explain about my inquiry approach. I responded to the teacher that I prefer to see as things unfold spontaneously and naturally. It looks like she was not contented with my answer. As we talked, she recalled and shared a story about a Master's student who visited the preschool a year before and did an interview with the teachers. She described how interesting the interview was. This made me realize that the teachers possibly have their own ideas about what constitutes good research.

I came to realize that perhaps unconsciously, despite being taught very clearly that the researcher is always entangled and involved in his or her research, I had nevertheless, in a sense tacitly, wanted to see myself as an observer, not contaminating the research. It seems as if the power of previous epistemologies lives on in the common sense thinking of culture and has a tendency to resurface in our unexamined views of self. Yet it's an impossible illusion. We are always entangled in our world, our research. There is no omniscient God's eye view (Alaimo, 2017b) for the researcher. As Haraway (1988, 581) pointed out, we are not performing a "god trick" and make "a conquering gaze from nowhere"(581), but we are always already situated: always already entangled with other species and non-human others.

A key message lying at the heart of my research is that in order to realize our entanglement and change how we relate to the environment, we need to change our way of knowing and being. There is no discrete 'we' hermetically cut off, cropped neatly and completely from an environment either stewarded or exploited. Rather there is an assemblage of agents-some human and some non-human. Similarly, this change in ways of knowing and being can and should lead to questions about the different cultural and geographic features of human actants.

My research does not primarily address this aspect (though neither is it immune to it as these reflections attempt to foreground). However, as humans are always entangled with the wider environment and other species of which they are apart, a researcher is also entangled with his or her stories of origin and culture. Reality is more complex and human existence, regardless of geographical differences, is not detached from the complex flaws and intricate entanglement with all sorts of fellow human species, other species, non-human others and material worlds. As such, there is a need to rethink the narratives of

environmental and sustainability education, but also of climate science, with the view to embrace diverse voices and influences.

In summary, despite the challenges I encountered along the way, the post-qualitative approach that I embarked on gave me the freedom and flexibility to be experimental and creatively engage with environmental issues such as climate and biodiversity issues. The methodological journey has taught me how difficult it is to unlearn earlier methodological approaches that were fossilized in my mind to try and learn to think afresh.

4.3. Ethical Considerations

The ethical implications of this study is an important aspect of the research. Children have rights which are specific to them and they should be treated and consulted accordingly while involved in research activities (Greig et al., 2013). Likewise, the study has been conducted in such a way that children's safety, participation, freedom, willingness to engage and rights to withdraw are handled in a professional, legitimate and respectful manner.

Before the commencement of the field work, consent from the children, parents, teachers and the preschool management was obtained. The purpose of the study, the procedure, the tools and devices to be used during field work were explained to the children, teachers and parents. An information letter with introductory information, coupled with consent forms, were prepared and signed by the participants before the "field work" began. Children's willingness (for me to join and follow the group) was sought verbally (asking their permission orally) and through their parents too. All confidentiality issues and the possibility of withdrawing at any point was explained and made clear to all involved though no one opted to withdraw during the process. Moreover, the children's comfort on a daily basis has been closely monitored. The study also adheres to the ethical rules for research in the humanities and the social sciences adopted by the Swedish Research Council.

However, this study is not limited by the aforementioned conventional humanist ethics, which describes human's responsibility as expressed through language. Post-human ethics includes non-human entities when considering "who matters and what counts" and when considering research practice (Taylor and Hughes, 2016). In posthuman thinking, ethics is contextual and entangled, framed from the dynamic relationalities of becoming of which we are part in the research process rather than as the traditional right response to an

METHODOLOGY AND NATURE OF INQUIRY

“exteriorized other” (Scantlebury and Milne, 2019). Ethics are not separate elements of human actions but are situated/entangled and emergent. Given the posthuman condition of ethics into account, I have remained vigilant for any unforeseen risk or ethical issues/dilemmas (on humans/more-than-human involved) that might emerge in different dimensions of the study. Yet, such ethical issue did not arise during the fieldwork.

In summary, this dissertation employs both conventional interpretative, descriptive methodologies (systematic literature review and curricular content analysis) and an emergent form of post-qualitative inquiry (data assemblage). This shift in methodological approach was necessitated by the nature of the key question that each study ended up posing. The next chapter presents the summary of the findings in the four articles constituting this dissertation.

Chapter Five: Summary of Findings

This thesis focuses on Early Childhood Education (ECE) in relation to sustainability. The thesis investigates post-anthropocentric possibilities of environmental sustainability within early childhood education. To this end, four different studies are used. This chapter presents the findings of each of the studies.

The first paper of this dissertation broadly traces the conceptualisation of Early Childhood Education for Sustainability (ECEfS) from its historical beginnings, through policy, pedagogy and research perspectives. Intrigued by contemporary posthumanist and new-materialist thinking, I pose fundamental questions about the underpinning ontological, epistemological and ethical starting points with the aim of inviting a rethinking of the notion of sustainability within early childhood education in general and in ECEfS in particular. By employing concepts borrowed from posthumanism, I problematize the human-centric tendency of present dominant forms of ECEfS, and its environment- and nature-focused predecessors. This tendency or bias prevents the agentic characteristics of the non-human world from entering ECEfS. In an effort to challenge and intervene in the prevailing anthropocentric notion of sustainability, I challenge the existing dominant child-centric discourses and call for the ECEfS field to consider the ontological, epistemological and ethical shifts that are provoked by a posthuman perspective.

Employing content-analysis as the key method, the second published article examines the manifestation of sustainability in the prevailing curriculum within five countries: Australia, England, Norway, Sweden and the USA. The analysis focused on four aspects of the curriculum: sustainability presence, views of the child, human-environment relationship, and philosophical and theoretical underpinnings of ideas expressed regarding sustainability. Critical inquiry with a posthumanist backdrop served as a guide for cross-national dialogue among the authors from the five countries. The results indicate that ideas about sustainability were more implicitly present than explicitly stated in most of the curriculum. It was not evident that children were viewed as world citizens with agency to help foster sustainability. With respect to human-environment

relationships, the framework from Australia expressed greater reciprocity and entanglement, while other frameworks were more anthropocentric, despite the variation among curricula. All five frameworks embodied a socio-cultural, human development approach with respect to the philosophical and theoretical underpinnings. The study suggests the need to consider alternative frameworks that offer broader and more inclusive worldviews about sustainability.

The third article of this dissertation shows how a materialist understanding of weather (and by implication climate) in early childhood education offers possibilities to move beyond anthropocentric and linguistic representations of weather towards more relational ones to provide a potential basis for sustainable living. This study highlights the importance of being attuned to and to learn to be affected by the vital materiality of weather as a way of knowing elucidates our enmeshed, embodied and embedded relationship with weather and climate. It is speculated that this way of knowing might provide a way into heightened ecological sensitivity and intimate attunement to climate. Drawing on weather-generated empirical data, the research demonstrates how humans, both young and old, are moved by the weather which calls for a relational epistemology that urges us to notice and engage with the vitality of weather. In the end the research suggests that child-weather assemblage thinking provides a possible way for pedagogically addressing children's entanglement with the weather. Such thinking and rethinking might pave the way for how weather pedagogy, as an exemplary relational pedagogy, could be enacted from a materialistic characteristics point of view.

Using species extinction as a critical sustainability challenge, Article IV explores the pedagogical possibilities of engaging young children in the potentially cataclysmic death of the honey bee. Drawing ideas from a post-qualitative inquiry, this study is empirically anchored in a narrative that emerges from a staged theatrical performance of child-bee assemblage that enacts the collective agency of 'bee-ness'. By enabling possibilities of 'becoming-with the bees', the performance lends itself to triggering response-abilities and the forming of relationships which enable a concomitant emotional affective response to the death of bees. Thus, the performance creates a temporal space that yields possibilities for children to de-territorialize and 'become-with' the bees, that is; to identify themselves with them, with their intertwined fates and consequences. The study suggests alternative directions for environmental sustainability pedagogy in early childhood education that represent a shift from

SUMMARY OF FINDINGS

loving, caring and preserving nature as an object outside ourselves, towards becoming nature, seeing humans as part of nature.

Informed by affect, Articles III and IV provide a way to attend to children's dynamic encounters between bodies, ideas, performances, materiality and forces, and other species, which characterize the children's engagement in sustainability issues such as weather and climate, and species extinction. As the children encountered the weather and the bee theatre, there was a change in their talk, action and engagement with the weather and the bees, which led to the emergence of different on-going responses. The affective dynamics operating in these contacts inscribe and transform the assemblage (child-weather assemblage and the child-bee assemblage) into a process of embodied repeated responses and engagements and response-abilities, through which feelings of joy and concern, as well as actions were created.

Chapter Six: Discussion

Informed and inspired by the research path travelled over a period of four and half years, this dissertation has made knowledge contributions in the following domains: rethinking of sustainability, education, the child and the nature of inquiry in Early Childhood Education for Sustainability.

6.1. 'Becoming Sustainable'

The anthropocentric approach to sustainability, despite, normally unintentionally, ultimately reiterating the human-environment binary, has for a long time produced useful knowledge. However, as we are entering a stage in the planet's history wherein we are obliged, as a matter of urgency and perhaps survival, to change the way we live, it is imperative to opt for alternative ways of being and knowing. We need to learn to recognize that we humans are a part of nature and nature is a part of us. Failure to do this jeopardizes our existence as well as that of other species. In this endeavor, education has a central role to play in the pursuit of new and alternative ways of theorizing and conceptualizing sustainability. I refer to the search for these alternative ways of knowing as 'becoming sustainable'.

'Becoming Sustainable' is a term that debunks the conventional understanding of sustainability as a "definite", known and pre-defined notion. As observed in Articles I and II, the current premises of sustainability education in general and ECEfS in particular, mainly draw on a humanist framework (i.e. capacitating and empowering humans) to cope and deal with sustainability challenges - i.e. to become environmental stewards who can take care of and sustain "nature". This approach, however, has several drawbacks.

To begin with, the conventional understanding of sustainability is limited by the idea of sustaining the current status quo, which implicitly conveys the idea of preserving what prevails rather than changing for better. Additionally, it is a one-sided discourse that unintentionally reiterates the human-environment binary, one that sustainability is, arguably, meant to transgress. Such an understanding of sustainability also has an inward-looking approach that centres on humans, and tends to ignore relationality by having a persistent bias

towards linear and causal thinking. As a result, it lacks the complexity to capture humans' entanglement and connection to the wider world, and the need to be tuned in with nature.

Likewise, the current ethos of sustainability in ECE pursues a normative ontological direction which is aimed at empowering agency and building certain predefined moral values in children. Such an ethos is not in line with the ontological, epistemological and ethical underpinnings that a post-anthropocentric framework introduces. Post-anthropocentric thinking calls for ontological and epistemological multiplicity and an ethics of "response-ability" (Haraway, 2016) and relational ethics. This begs the question: how productive and adequate is it to use the term sustainability and to what extent does it serve its purpose?

This conceptual fluidity in turn brings about a philosophical and scientific challenge to the conceptualization of sustainability in general and within ECEfS in particular. While challenging conventional understanding of sustainability as a "definite" state of affairs, Reinertsen (2017) reconceptualized sustainability as "processes of thinking/feeling that are pluralistic, nourishing, and restorative, all in all, as continuing processes of change that imply authentic, positive, or healthy contemporary becomings nomadically created and recreated over time" (p.242).

In the same vein, in my experimental inquiry with the weather and bees, I take a non-anthropocentric stance while drawing on ideas from posthumanist thinking. Article III and Article IV show how different modes of thinking (assemblage thinking and "becoming-with"), open up possibilities to challenge and reconceptualise our (humans') place and position in the world. The reconceptualization of the human and other beings, and viewing their relations as assemblages and becomings, can help us rethink the way we approach the non-human world and actual beings in the environment. In articles III and IV, sustainability is viewed as an "enactment of various assemblages of data, content, action...etc." (p.242). This in turn calls for concomitant changes in our approach and our very conception of sustainability as both a notion and practice.

This ultimately implies a shift from the conception of sustainability as something we can do by ourselves as a human species, towards what we need to do in order to become with others (e.g. other species and forces), forming what Deleuze and Guattari (1987) refer to as life-affirming assemblages. Doing so will require an expansion of the conceptualization of sustainability to include

DISCUSSION

the formation of spontaneous and emergent life-affirming assemblages. There is a need to re-examine our place in the world and our relationship with the more-than-human world and its vibrancy.

Attending to the vibrancy of the more-than-human world highlights the need to work within a new ecology, which Bennet (2010) refers to as the political ecology of forces and things that open up possibilities for becoming sustainable. When taking this position seriously, research on sustainability, perhaps especially, in the context of education, learning and capacity-building, could benefit from paying attention to the vibrancy of the non-human aspect of the world. Doing so opens up alternative ways of knowing such as affective and embodied ways of knowing which can help us move beyond humanist, cognitive and anthropocentric ontologies. Such an understanding offers the possibility to rethink and expand the notion of sustainability. Put differently, it becomes possible to move from sustainability as a discourse to sustainability as emergent property of entanglement in vibrant matter, forces, affects, encounters and relationships, which concomitantly leads us to the question: what might 'becoming sustainable' really mean for ECE?

As we are trying to rethink living in times of acute catastrophic climate change, loss of biodiversity and environmental disasters, such a creative rethinking of the concepts of sustainability and environmental issues are imperative for alternative knowledge (re)generation. Accordingly, as indicated in Article III, climate change can be addressed through embodied and affective engagements with the vibrancy of the weather. As weather and climate are two interlinked phenomena, the discussion on weather extends itself to how this might be extrapolated to the wider global challenge of runaway climate change. Climate is understood as a form of long-term weather that changes slowly and manifests itself over a longer time period. Given its subtle and inconceivable nature, it is difficult to have mastery and control over climate change. Yet, the now and present weather can be embodied and sensed as indicated in the vignettes in Article III.

In times when extreme weather events are increasing as a result of climate change, embodied and affective attunement to weather could very well lead to attunement to climate change. Thus, attuning to the vitality of weather and understanding the fragility, permeability, vulnerability and porosity of our bodies as affected by the force of the elements has the potential to lead to ecological sensitivity and possibly caring about climate change. The latter is

often considered as a slow and remote process, and hence an inconceivable and abstract phenomenon.

Therefore, drawing on the weather-generated empirical vignettes in Article III and becoming-with the bees in Article IV, this dissertation calls also for a different sustainability ethos; rather than viewing sustainability as a “definite” state of affairs that we can learn about as a pre-defined entity, it might better be understood as a generative concept that is beyond social, human and cognitive affairs. Generative conceptualisation of sustainability may include: sustainability as forming life-affirming assemblages; sustainability as becomings and response-abilities; sustainability as being affected rather than as something that can be mastered and controlled; sustainability as entanglement, interconnection and relationship with the environment/the more-than-human world; and sustainability as a sense of belonging to nature or a particular environment.

Put differently, borrowing the term from Deleuze and Guattari, I argue for the need to deterritorialize our conceptualisation of sustainability. In doing so, knowing for sustainability could alternatively be viewed as an iterative process of deterritorialization wherein humans/children become-with nature (bees in particular) and experience oneself as nature-not separate from it. Hence, such deterritorializing processes could be understood as one component (of many) contributing to a new/alternative conceptualisation of sustainability in ECEFS. Deterritorialization refers to a movement by which something escapes or departs from a given territory/context to another, and produces something new/new relations (Deleuze and Guattari, 1987, p508).

Yet despite the potential of these generative and emergent understandings of sustainability, it should be noted that there is an underlying normative aspect embedded within the notion of sustainability *per se*. This is the assumption that it is worthwhile that we humans survive on this planet in a good way, which makes us feel responsible and accountable towards other species and future generations. As a result, we are obliged to attend to and deal with the problems rather than passing on a damaged world to a future generation. However, our ability and intelligence do not allow us to know everything, yet we are responsible to play a critical role. The post-anthropocentric stance that I take in this dissertation is not intended to deny human agency, but to challenge the excessive emphasis it currently receives and to offer the possibility of learning alongside other agents and forces. In line with this post-anthropocentric perspective, Cielemecka & Daigle (2019) argue that we need to embrace “an inclusive posthuman approach to sustainability that decenters the human, re-

positions it in its ecosystem and, while remaining attentive to difference, fosters the thriving of all instances of life”(p.6).

6.2. The Unfolding Relational and Affective Child

As indicated in Articles I and II, ECEfS mainly draws on a humanist framework to promote children’s agency. Drawing on posthuman concepts such as assemblage, distributed agency and becoming-with, the third knowledge contribution area challenges the idea of producing a rational, ethical and agentic child, and explores possibilities for the unfolding relational and affective child and its implication for sustainability. From a post-anthropocentric perspective, the child is not a fixed autonomous and self-privileged subject, but rather situated within an agentic and assemblage world in which he/she becomes-with and is affected by multiple actors, forces and entities. Pedagogically, this moves ECEfS from the agentic child to diverse ways of coming to knowing such as: affective learning, embodied learning, learning with and becoming-with others. The agentic relational child emerges from entanglement, interaction and intra-actions.

Shifting from orthodoxies of child agency towards notions of a more distributed agency, where agency is shared with non-human materialities and other species, opens up possibilities for fundamentally rethinking children’s relationship with the world. This entails the requirement to liberate ECEfS from its confinement and celebration of the tenet of the agentic child towards an entangled, relational and affective subject who is constantly co-constituted together with non-human agentic forces.

In an effort to discuss this shift, I borrow Braidotti’s new-materialist understanding of the relational human subject, which suggests a non-anthropocentric subject position. As she points out: “Human subjectivity in this complex field of forces has to be re-defined as an expanded relational self, engendered by the cumulative effect of social, planetary and technological factors. The relational capacity of the post-anthropocentric subject is not confined within our species, but it includes non-anthropomorphic elements: the nonhuman, vital force of life...” (Braidotti, 2016, p.22).

Braidotti’s (2016) idea of human subjectivity as an expanded relational self urges us to rethink how subjectivity has been enacted in environmental education in general and within ECEfS in particular. Adapting a posthumanist

concept of subjectivity transcends a focus on the individual by moving towards the notion of a collective and connected affective assemblage of humans as well as other species, bodies and materialities.

Thus, rather than starting with the notion of a predefined agentic child subject, assemblage thinking has helped in recognizing the ontological multiplicity that challenges anthropocentric subjectivity. As can be seen in the empirical part of Article III and IV, subjectivity is co-constituted with the human children, the teachers, the researcher, the force of weather and the bees. Likewise, agency is shared among these co-existing subjects (children, adults/teachers, researcher, weather and bees) within an assemblage. This entails that there is not just a learning child but affective children alongside whom teachers and other agents also learn, interact and become-with. Thus, teachers need to pay attention to and engage with the children's affective relationship with the natural world as this might bring in something that might otherwise be overlooked.

Parallel with agency, ethics is another aspect that requires rethinking. Post-anthropocentric thinking challenges the idea of educating the rational and ethical child who knows the ethical principles and is capable of making rational ethical choices. Instead it calls for entangled and relational ethical practices, where vulnerability and suffering are shared in a collective manner. Such ethics call for an entangled subjectivity which "opens up possibilities for a shared pain and mortality and learning what that living and thinking teaches" (Haraway, 2008. p.83). The theatre in Article IV illustrates how such an ethics can take shape when the children are urged to share the pain of the bees. As portrayed in the theatre and by the response from the children, ethics takes on performative dimensions. The children perform the bees in their play, art work and outdoor activities. In doing so, ethics is articulated through children's touch (of the dead bee), hands-on activities (arts and crafts) and bodily movement (dance, music, theatre).

Relational ethics cultivate sensitivity towards the other and generate what Haraway (2008) refers to as "response-ability" (p.71). Such ethics challenge the notion of caring at a distance and help imagination to be articulated and experienced. Consequently, relational ethics urge us to be open and receptive to the suffering of others (e.g. the bees). Thus, ECE should not confine itself to educating children with abstract ethical principles, but instead open up possibilities for such response-abilities: not simply loving and caring from a distance. Therefore, ECEfs need to challenge the dominant and longstanding

DISCUSSION

orthodoxy narratives of the autonomous, moral and relational child and introduce the affective child which is not widely discussed in ECEfS research and pedagogy.

To be sure, this dissertation is not abandoning the idea of the rational and ethical child but rather challenges it by highlighting its limitations and by calling for an enrichment of that perspective by embracing and connecting with other actors and forces. In doing so, relational ethics opens up other possibilities for reflexive thinking, which allows us to recognize, mirror and confront our relationship with other species and forces.

6.3. Rethinking Education

Parallel to reconceptualizing the notion of sustainability and the notion of the child, there is a need to develop alternative ways of looking at education by embracing perspectives that have been absent in sustainability discussions. This entails examining the ontology, epistemology and axiology of educational thought underpinning sustainability education. As indicated in previous studies, sustainability education in general, and ECEfS in particular, mostly focus on building cognition, skills, attitudes and empowerment of children (Hadzigeorgious et.al 2011; Engdahl & Rabusicova, 2010; Caiman and Lundegård, 2014). Such an approach is confined to a conventional way of knowing and unintentionally overlooks alternative ways of knowing such as affective and embodied ways.

This calls for education and perhaps for ECEfS in particular, to enrich and broaden its context by recognizing that human beings are multiple and already enmeshed, embodied and affective, with other species and other forces within an assemblage. Yet in conventional ECEfS discourse, we often talk about learning to be and learning to care. Becoming with and learning to be affected are not well developed notions within ECEfS. However, to learn is also to 'become-with', to 'learn with' and to 'learn to be affected by' others. Viewed as such, sustainability education at large and learning/knowing for sustainability is not just a cognitive process to know, control and master the world, but it also embraces how one can deterritorializes (Deleuze and Guattari, 1987) and becomes-with non-human others.

Likewise, to teach for sustainability is not just to transfer predefined knowledge, but is rather a continuous search for generative ways of becoming. Teachers are not just hegemonic knowing agents, but rather they become-with

the children. Teachers are not meant to simply focus on children, but learn together with the children consciously trying to avoid dichotomies.

Hence, ECE should not solely focus upon the children, but rather explore what the shift, from individual child to assemblage and from being to becoming, might contribute to ECEfS pedagogies. From this vantage point, ECE serves as an emergent process that allows for the child to unfold and draws out relationality by permitting ways of being and becoming that lead to more sustainable ways of living as a continuous search. This entails the need to explore emerging notions of relational pedagogies (Ceder, 2015; Murriss 2017) for sustainability education.

An important dimension of enacting relational pedagogies in ECE is to have a more open view of subjectivity. Rethinking subjectivity, rather than aiming to teach any specific knowledge and skills that are deemed necessary for finding sustainability solutions, calls for repositioning the child and generating the knowledge and skills required to understand the expanded relational self. The human subject at large, and children in particular are multiple and pedagogies should be viewed as such. Thus, there is not just one idealized cognitively learning human subject but a range of subjects (humans and non-humans) and other agents in entangled relationships of emergent learning.

A subsequent question is whether any existing curriculum currently allows for such subjectivity to emerge in everyday learning spaces in the first place. Non-human agents are manifested in a non-linear and unprecedented manner requiring an emergent, living curriculum instead of a structured and predefined one. Teachers need to remain attuned to the emergent and non-intentional characteristics of sustainability activities and potential events (Reinertsen, 2017).

For instance, as observed in the case of Somerville and Green (2015), who refer to place as an agentic entity, there is demand for a curriculum of place and space rather than one confined to disciplines which, by default, draw boundaries between human (the learning subject) and non-humans (object to be learnt). Such a reconfiguration would, of course, require a deconstruction and reconfiguration of existing curriculum frameworks and pedagogical practices, and thus challenge established ways of being, and instead open up the ECE curriculum to new and generative possibilities.

Parallel to repositioning curricula, a pedagogical reorientation appears necessary as well. Moving towards a more relational pedagogy - or a pedagogy of entanglement - implies recognizing and embracing the agentic characteristics of non-humans as well as our inevitable embeddedness in a web of connections

DISCUSSION

and continuously evolving relations. While borrowing the term pedagogy of entanglement from Gannon (2016) and Letts and Sandlin (2017), I highlight its relevance and potential for rethinking sustainability pedagogy in early childhood education. Enacting a pedagogy of entanglement calls for a rethinking of our understandings of time and space in sustainability pedagogy. From this perspective, sustainability cannot always be considered as something that can be predetermined, predefined and ‘taught’, but rather as an emergent phenomenon of becoming with and relating to the aim of continuity of life in all its richness.

Recognizing and enacting the agency of non-humans requires teachers to have a key role by altering the pedagogical conditions. How teachers think about children, themselves and sustainability per se, and what conditions they can create or are able to find in the everyday pedagogical environment, is critical. If teachers are not in tune with the agentic qualities of the non-human world (e.g. materialities, other forces, animals, places), they might unintentionally “delearn” and “denature” children or keep things (i.e. assemblages and entanglements) from being recognized at best, or from happening at worst. If teachers are able to disrupt existing ontological and epistemological assumptions, new possibilities emerge for “rewriting children” with the natural world and sowing the seeds of entanglement before they become ingrained with the anthropocentric worldview they will likely encounter in their later schooling. Thus, the way we shape curriculum and pedagogy, and the kind of knowledge teachers appreciate, plays an integral role.

Assemblage thinking, which highlights children’s relational entanglements, has been identified as an important pedagogical tool to open up and recognize possibilities for rethinking children’s mundane and seemingly trivial everyday encounters with the non-human world in and around preschool settings. By acknowledging these entanglements and expanding children’s possibilities to be entangled with all that is around us, early childhood educators can provide an approach into a more connected way of being in the world. Doing this requires teachers to rethink and organize their activities as emergent and relational, so that all actors (humans and non-humans) are coming into play within an assemblage, without being constrained by predefined subject areas and prescribed goals. By acknowledging and foregrounding non-human agency, early childhood educators might be able to turn the pedagogical gaze towards relationality, reciprocity and entanglements of humans (children) and non-humans.

Traditionally, the pedagogy within early childhood education for sustainability (ECEfS) has taken a certain path which includes: nurturing love and care for nature and the need to preserve it; building agency; focusing on science and action-oriented practices. However, these approaches do not transgress or go beyond anthropocentrism. Teachers need to reflect on and ask important questions, such as: what kind of knowledge has the power to influence us (e.g. researchers and educators), and hence the children that we are educating?

Doing so calls for a transformative pedagogy that directly calls on teachers to elicit and reflect on the premises and assumptions underlying their pedagogical activities. A key point here is to possibly move away from viewing children as individual agents and autonomous learners or what Taylor (2017) refers to as environmental stewards. Instead, it is important to recognize ontological multiplicities—the different ways of being and relating with others—to allow children to think and learn with the non-human world, a world that they are inherently entangled with and one they constantly encounter in their everyday life.

In particular, this is important in early years of education, where socio-cultural and developmental pedagogy, which seek to promote a conscious meaning-making process, has remained dominant. Arguably, children see and are still open and able to see themselves as integral to this world, and are therefore better positioned to developing a symbiotic relationship of “becoming-with” the world. Manning and Massumi (2014) even argued that young children already know affect. Ironically most adults seem to have lost this affective and relational capacity to a large degree as a result of the education they received. Perhaps adults could learn from how children relate to the natural environment. Early childhood education is a uniquely positioned field as it allows us to see curriculum and learning in a holistic way rather than breaking it down into different domains and subjects, which can lay a foundation for a lifelong relational curriculum.

6.4. Rethinking Approach to Inquiry in ECEfS

The fourth knowledge contribution aspect involves the very process and practice of research (i.e. nature of inquiry) within Early Childhood Education for Sustainability. Sustainability challenges are complex and wicked and hence require a rethinking of our epistemological assumptions and a search for a more

DISCUSSION

complex and rigorous methodological engagement. By and large, earlier research orientation within ECEfS can be viewed as researching: about children, for children and with children. In this dissertation, I introduce the idea of researching with non-human forces and other species or what is commonly referred to as the more-than-human world.

While promoting the idea of researching with the more-than-human world, I argue that research within ECEfS can become richer when it does not confine itself to the humanist framework, by recognizing and utilizing non-humans as knowledge-creating actors/entities. This might help us engage with the vibrancy of the non-human aspect of the world and will allow ourselves to be affected by and work within this new ecology, which Bennett (2010) refers to as the political ecology of things and beings. Attuning and engaging with the vibrancy of the more-than-human world requires experimentation and methodological freedom. ECEfS researchers could utilize various thinking territories around them, and experimental approaches like post-qualitative inquiry opens up such possibilities. Doing so requires a rethinking and deterritorialization (Deleuze and Guattari, 1987) of the very process of research and consider the researcher as affective being entangled in the work that he/she explores.

In this dissertation, I have attempted to show how post-qualitative inquiry could serve as a possible alternative approach for methodological creativity and hence a possible way towards sustainability. However, the implications of a post-qualitative inquiry approach for our conceptualization and research of sustainability (which in its core seeks to sustain and preserve) and sustainable development (which is to sustain continuous change) needs to be further explored with more examples. Our role and position as researchers, what is to be researched, and the ontological and epistemological fine line between the two needs to be thoroughly examined and elucidated with more empirical studies.

Yet, it should be noted that post-qualitative inquiry and its accompanying ontological turn is not yet well established in ECEfS research. Therefore, empirical investigation of post-anthropocentric approach brings about challenges, which may include: institutional structures, research cultures and scientific challenges. This again necessitates the need for more research that demonstrates the potential of this approach.

Chapter Seven: The pursuit of multiple ways of knowing for sustainability: suggested ways forward

I bring this dissertation to an end by opening up a conversation and making suggestions that pave the way towards multiple ways of knowing for sustainability. I begin this conversation by interrogating the broader notion of science at large and research practices within ECEfS in particular. At the heart of hegemonic scholarship practices within ECEfS lie inherent separations of: the adult researcher from the researched child; the living from the non-living; theory from practice; and the human (children and adults) world from the material world. Within this tradition, both research and practice in ECEfS are stuck in a paradigm where binary thinking perpetuates the aforementioned separations. By contrast, in a posthuman line of thinking, the human world is inevitably entangled with the non-human world. As stated by Powell & Somerville (2018, p. 2), we are living in a world with “ever-changing becoming” where human and non-humans are intricately intermingled.

The adoption of a relational ontology, which refutes dualisms, has been identified as a mechanism to become and remain attuned and engaged with matter and the non-human (Bozalek & Zemblyas, 2016). Such an ontology leads to a more relational way of looking at humans and the environment on the one hand and at theory and practice in sustainability research at large, and within ECEfS in particular, on the other. Such a relational ontology paves the way for the possibility to see our interconnectedness without falling into the trap of binary thinking. Enacting such an ontology requires creative thinking which allows us to challenge paradigms that perpetuate boundaries. Affective, embodied and intuitive ways of knowing are examples indicated in Articles III and IV of this dissertation that could help overcome binaries and show a path to relational and sustainable ways of being.

Accordingly, teachers need to enact curriculum for children to know and act in relation to non-human others, i.e. other species and material forces. Knowing for sustainability should not just be conceived of as having the knowledge, the ‘right’ behaviour or the required ethical values, but also, and, indeed, foremost

be viewed as the ability to discern non-human vitalities (Bennett, 2010) and to attune to affect. This requires teachers to be creative and organize activities as emergent and relational.

One possible approach is to create or employ life affirming stories and narrations (like the bee theatre) for pedagogical purposes. As indicated in the empirical examples in Articles III and IV, the narratives and vignettes of stories of children and their childhoods allow adults to think with children and their assemblages with the non-human world serving as a bridge across other ways of knowing.

Additionally, there is also a need to interrogate the overemphasized notion of agency in ECEfS. Pointing out the limits of human agency, Cielemecka & Daigle (2019) highlighted that “we have been powerless since there have been so many more agents than the mere human agent and since the agentic capacities of other beings have often surpassed our own very limited powers and thereby have impacted us in ways we have not suspected”(p.2). Alaimo (2016) also pointed out that the Anthropocene is urging us to “rethink agency in terms of interconnected entanglements rather than as a unilateral ‘authoring’ of actions” (p.156). Existing knowledge in ECE largely focuses on what children are able to do without embracing the agentic characteristics of the non-humans. Both in research and practice within ECEfS, the agentic power mainly rests within the human (the child and the adult), and essentially inhibiting our engagement and attunement to humans’ entanglement and connectedness with other species and non-human forces.

This human-centric understanding of agency has in turn led to humans’ “absurdity” in believing that they can solve, represent, control and master the material world, which unintentionally obscures our enmeshed connectedness with it. Despite being inadequate, and at times even inaccurate, human representations (often linguistic) simply heighten the separation. Hence, shifting the gaze from human’s ability to control nature to attunement to nature creates alternative learning spaces where children can *learn-with* and *affected by* non-human agents.

Moreover, complex environmental problems such as climate change and loss of biodiversity are presently and urgently demanding a re-orientation of science that recognizes multiple other ways of knowing that can help us recognize our relations and connections with nature and the wider world. Within this vein, environmental sustainability and, more specifically, education for environmental sustainability in ECE, can be conceived as a continuous

SUGGESTED WAY FORWARD

quest for finding ways to live in tune with the material world and with other species. This quest implies the need to combine different ways of being and ways of knowing with a plurality of sciences and scientific practices.

An endeavour to go beyond empirical analytical science brings about the need to recognize ontological and epistemological multiplicities that permit creative and generative engagement with the problems. To this end, ECEfS can benefit from complementing a childhood studies lens with a new materialist and post-human lens. Given the freedom it offers to experiment, post-qualitative inquiry has a potential to generate alternative and creative ways of knowing for sustainability.

Besides, I argue for a rethinking of practice within ECEfS. Often, in education at large and ECE in particular, practice emanates from human representation that invites and cultivates binary thinking (Scantlebury & Milne, 2020). An approach to challenge binary thinking and to open up possibilities for a more relational ontology is not to confine oneself with representing the world or to have a solution-oriented approach.

Without being confined to representation and its application, practice can have more performative characteristics while we become-with (as in the case of becoming-with the bees in Article IV) and affected by (e.g. as affected by the weather in Article III) the non-human others. This entails that practice could come out of performance, i.e. practice could be considered as an emergent phenomenon. Hence, drawing on St. Pierre's (2018) refusal on the demand of application, I argue that practice within ECEfS is not necessarily guided by a model to be applied, but it could also be a happening or an event that can be created and performed with the children. To this end, post-anthropocentric concepts such as assemblage and becoming-with serve as a tool.

Again, as we do not have definite solutions for contemporary Anthropocene predicaments, we should not necessarily think of teaching children how to come up with solutions. Rather, there needs to be a mechanism to engage young children and ourselves to remain curious with the problems, such as climate crises and mass extinction, without seeking for definite solutions. Haraway's (2008) notion of 'staying with the trouble' reminds us the level of the destruction that we inherit and hold in our hands and the need to stay attuned to our contact zone of more-than-human relations.

It should be understood that we are not handing over certain answers and definite methods to our children on how to deal with these ecological challenges. Therefore, as an alternative pedagogical approach, ECEfS could

work on engendering relationality and life-giving processes (e.g. pollination in the bee paper) that can help children and us to stay curious with the questions without necessarily moving to solutions. This is in line with Haraway's (2016) notion of the art of staying with the trouble, which urges humans to be mindful of our entangled relations with "nature" i.e. other species and the non-human forces.

Finally, I emphasize that the aforementioned ontological and epistemological rethinking has a potential to make non-human agents intelligible. It does so by opening up spaces of attunement, which makes it obvious how human life at large and children's lives in particular are intricately connected with other species and non-human forces. When conceived of as such, ECEfS opens up alternative ways of knowing for sustainability.

However, it should be noted that this study not only indicates the limits of mainstream ways of conceptualizing sustainability, but also supplements them and offers different ways of conceptualizing and enacting sustainability. Hence, the post-anthropocentric approach is not presented as a panacea for solving the current ecological problems, rather it strives to decentre the human and see its relationality and entanglement with the non-human others. Although posthuman theories help identify and challenge our human-centric characteristics, they fall short in addressing the highly resilient power inequalities and dominant structures that make transitioning towards a more relational and emancipatory conceptualization and, indeed, enactment of ECEfS difficult. This certainly implies the need for more studies, not just of ECEfS pedagogy and practice but also of ECEfS governance and policy.

Summary in Swedish

Denna avhandling fokuserar förskola i relation till hållbarhet. Denna relation har i sin tur historisk precedens genom kopplingen mellan förskola och natur och miljö. Erkännandet av kopplingen mellan undervisning om miljö och undervisning av barn/förskola började med föresatsen att grunden för livslånga föreställningar och värden för miljövänligt agerande läggs i de tidiga levnadsåren (Carson 1965; Tilbury 1994; Wilson 1992). Sedan dess har flera angreppssätt använts för att involvera och engagera barn i miljö- och hållbarhetsfrågor. Några av dessa omfattar: det kunskapsbaserade angreppssättet (Tilbury et al. 2005); det immersiva inlärningsättet som influerats av Jean Jacques Rousseaus klassiska arbete som förespråkar barns lärande i naturen (Rousseau 1979); den politiska dimensionen av miljöundervisning som tagit intryck av Paulo Freires kritiska teori; och mera nyligen, känslan av delaktighet, barns agens och deras förmåga att kritiskt engagera sig i miljö- och hållbarhetsfrågor (Ärlemalm-Hagsér and Davis 2014; Caiman & Lundegård 2014; Davis and Elliot 2014).

Trots att de fyra nämnda angreppssätten har haft en positiv inverkan på miljöundervisningen i flera decennier, har de inte utmanat det ontologiska antagandet som skiljer barnet från den icke-mänskliga naturen. De ontologiska och de besläktade epistemologiska premisserna hos dessa angreppssätt vilar till stor del på mänsklig agens och subjektivitet (dvs. betonar det avsiktliga, medvetna och lärande barnet som subjekt), och har en tendens att förbise andra levande varelsers, icke-levande materia och krafters agensegenskaper. Föreliggande avhandling undersöker alternativa sätt att konceptualisera förskolepedagogik, sätt som betonar människans/barnens intrasslade relation till den mer-än-mänskliga naturen.

Syfte

Syftet med avhandlingen är tvådelat. För det första utforskar den hur föreställningen om hållbarhet konceptualiseras inom förskolepedagogisk forskning. För det andra utforskar avhandlingen ”post- antropocentriska” möjligheter för miljörelaterad hållbarhet i förskolans undervisning.

Forskningsfrågor

I ett försök att uppnå syftet ovan, strävar studien efter att besvara följande nyckelfrågor:

- Hur förstås och konceptualiseras föreställningen om hållbarhet inom förskolans undervisning?
- Hur konkretiseras och artikuleras hållbarhet i förskolans läroplan?
- Hur kan ”post-antropocentriska” analyser generera alternativa sätt att konceptualisera hållbarhet?
- Vilka lärandearenor kan uppkomma i och genom ”post-antropocentriska” analyser av hållbarhet i kontexten förskolepedagogik?

Teori och metodologi

Begreppsligt vilar denna studie på tankegångar från posthumanistisk teoribildning. Studien fäster uppmärksamheten på frånvaron av posthumanistiskt tänkande (Haraway, 2008, 2016) och dess inordnade föreställning om nymaterialistiska perspektiv (Bennett, 2010) inom förskola och hållbarhet. Denna frånvaro kan i grunden göra det svårt att förverkliga en pedagogik som tillåter barn att se sin (mänskliga) värld och den mer-än-mänskliga världen som intrasslade och sammanflätade. Posthumanismen kritiserar antropocentrisk humanism och öppnar kunskapsproduktionen för andra arter och den mer-än-mänskliga världen. Därmed kräver den en omprövning av subjektivitet och agens. Posthumanismen ser agens som distribuerad (Bennett, 2010) och subjektivitet som en ”icke-enhetlig” entitet (Olsson, 2009), inte något som är inneboende i individen, utan som uppkommer i och genom relationer och sammankopplingar mellan mänskliga och icke-mänskliga entiteter.

Metodavsnittet är indelat i två olika delar: en tolkande hermeneutisk del och en post-kvalitativ del. Systematisk litteraturstudie och läroplansanalys används som metod i den hermeneutiska delen av avhandlingen. Den systematiska översikten sammanfattar i korthet innehållet i tillgängliga forskningsöversikter, internationella forskningssammanställningar, policydokument, enskilda artiklar och bokkapitel inom fältet. Nyckeltermerna som: yngre barn och hållbarhet; förskola och miljöundervisning; förskola och lärande för hållbar utveckling användes för att hitta forskning i fyra olika databaser: Scopus, ERIC, Web of Science och Google Scholar. Läroplansanalysen undersökte hur föreställningar om hållbarhet integrerats i styrdokument för förskolan i Australien, England,

Norge, Sverige och USA. Analyserna baserades på kritisk teori och internationell dialog och fokuserade på fyra aspekter av styrdokumentet: förekomsten av begreppet hållbarhet, synen på barnet, förhållandet människa-miljö och den filosofiska/teoretiska underbyggnaden av formulerade föreställningar om hållbarhet. Post-kvalitativ forskning betonar vikten av teori och vidhåller att forskare behöver bli engagerade i tänkande med teori och ägna mer tid åt att läsa teori än att styras av en rigid metodologi som tillämpas av praktiska skäl (St. Pierre, 2015). Post-kvalitativa forskare hävdar att begrepp skapar möjligheter till och tänkande med data i motsats till insamling av befintliga data (Lather, 2012; Lather & St. Pierre, 2013). Med stöd av idéer från postkvalitativt tankesätt, används Nordströms (2015) begrepp dataansamling (assemblage), vilket tillåter en sammankoppling av data från möten med det mer-än-mänskliga. Som Nordström påpekar (2015), "Dataansamling är en dynamisk onto-epistemologisk enhet vars grundlinjer öppnar upp för nya idéer att tänka om data och vad denna data kan göra och bli" (p.166).

De olika studier som har använts för att besvara de fyra forskningsfrågorna har publicerats i fyra artiklar och presenteras kort nedan.

Artikel I: Utmanande och expanderande föreställningar om hållbarhet inom förskolepedagogik

Den första artikeln i denna sammanläggningsavhandling utforskar i vid bemärkelse föreställningar om hållbarhet inom förskolan, från forskningsfältets historiska uppkomst och framåt, via policy-, läroplans-, och forskningsperspektiv. Inspirerad av samtida posthumanism och nymaterialistiska tankesätt, granskas existerande föreställningar om hållbarhet inom förskolepedagogik i allmänhet och inom förskolans hållbarhetspedagogik i synnerhet. Med begrepp lånade från posthumanismen problematiseras den människocentrerade tendensen inom hållbarhetspedagogik i förskolan och dess miljö- och naturfokuserade föregångare. Detta görs genom en analys av ontologiska, epistemologiska och etiska utgångspunkter inom förskolepedagogik. Den människocentrerade tendensen eller ensidigheten kan hindra den icke-mänskliga världens agensegenskaper från att framträda i förskola och hållbarhet. I ett försök att utvidga befintliga föreställningar om hållbarhet, utmanar jag den rådande dominerande barncentrerade diskursen och uppfordrar fältet förskola och hållbarhet att beakta de ontologiska,

epistemologiska och etiska förändringar som genereras av det posthumanistiska perspektivet.

Artikel II: En kritisk analys av begrepp förknippade med hållbarhet i läroplaner för förskolan

Genom att använda innehållsanalys som nyckelmetod, undersöker den andra publicerade artikeln uttryck för hållbarhet i fem länders nationella läroplaner för förskolan: Australien, England, Norge, Sverige och USA. Analyserna fokuserar fyra aspekter av hållbarhet i läroplanerna: närvaro av hållbarhet, synsätt på barn, förhållandet människa och miljö, och filosofiska och teoretiska förstärkningar av uttryckta idéer om hållbarhet. Kritisk forskning med en posthumanistisk grund fungerar som vägledning för en internationell dialog mellan författarna från de fem länderna. Resultaten tyder på att föreställningar om hållbarhet är mer implicit närvarande än explicit uttryckta i läroplanerna. Det framgår inte att barn betraktas som världsmedborgare med agens att hjälpa till att utveckla hållbarhet. När det gäller förhållandet människa och miljö, uttryckte ramverket från Australien större reciprocitet, medan andra ramverk var mer antropocentriska, trots variationen i läroplanerna. Alla fem ramverk gav uttryck för ett sociokulturellt, människocentrerat perspektiv på utveckling. Studien visar på möjligheterna med att beakta alternativa ramverk som erbjuder vidare och mer inkluderande världsbilder av hållbarhet.

Artikel III: Lärande med vitala materialiteter: undervisning om väder i förskolan

Den tredje artikeln i denna sammanläggningsavhandling visar hur en materialistisk förståelse av väder (och implicit av klimat) i förskoleundervisning erbjuder möjligheter att gå bortom antropocentriska och lingvistiska representationer av väder mot mer relationella representationer för att bidra till en potentiell grund för ett hållbart liv. Denna studie lyfter särskilt fram betydelsen av att vara i samklang med och påverkad av vädrets nödvändiga materialitet som ett sätt att nå kunskap. Ett sådant epistemologiskt förhållningssätt skiljer sig från det empirisk-analytiska vetenskapliga sättet att nå kunskap, vilket strävar efter att kunna förutsäga och kontrollera vädret. Medan det vetenskapliga förhållningssättet hänför vädret till yttre orsaker och vidmakthåller den mänskliga/icke-mänskliga separationen, belyser det epistemologiska vårt invecklade, förkroppsligade och inbäddade förhållande till väder och klimat, vilket kan möjliggöra en väg till ökad ekologisk känslighet och

anpassning till klimatet. Med stöd av vädergenererade empiriska data, visar forskningen hur människor, unga som gamla, påverkas av vädret vilket påkallar behovet av en relationell epistemologi som uppmanar oss att uppmärksamma och engagera oss i vädrets kraft. Till sist tyder forskningen på att barn-väderfigurationer (assemblages) möjliggör ett sätt att tänka om barns förhållande till vädret. Ett sådant tänkande och omprövande kan bereda väg för hur väderpedagogik, som exempel på relationell pedagogik, kan iscensättas med nymaterialistiskt perspektiv.

Artikel IV: “Tillblivelse med bin”: affekt och responsförmåga med döende bin i förskoleundervisning

Genom artutrotning som en kritisk hållbarhetsutmaning, utforskar artikel IV de pedagogiska möjligheterna att engagera förskolebarn i den potentiellt katastrofala bi-döden. Understödd av idéer från postkvalitativ forskning är denna studie empiriskt förankrad i ett narrativ som uppstår i en barn-bi-figuration. Det iscensatta teaterliknande framträdandet förkroppsligar den kollektiva agensen av att vara ett bi. Genom att tillåta möjliggörande av tillblivelse med bin, inbjuder framställningen till en emotionell, affektiv respons på binas död. Följaktligen skapar iscensättandet ett temporalt utrymme som genererar potential för barnen att av-territorialiseras och ”bli till med” bina, det vill säga; identifiera sig med dem och med deras sammanflätade öden och konsekvenser. Studien föreslår alternativa riktningar för miljö- och hållbarhetsundervisning i förskolan som representerar en förskjutning från tillgivenhet till, omhändertagande och bevarande av naturen som ett objekt utanför oss själva, till att bli natur, människan som del av naturen.

Med stöd av affektbegreppet tillhandahåller artikel III och IV sätt att uppmärksamma barns dynamiska möten mellan kroppar, idéer, iscensättningar, materialitet, krafter, och andra arter, vilket kännetecknar barnens engagemang i hållbarhetsfrågor som väder och klimat, och artutrotning som uttrycks genom binas död. När barnen mötte vädret och biteatern, förändrades deras tal, handling och engagemang i vädret och bina, vilket ledde till olika responser. Den affektiva dynamiken som verkade i dessa möten formade och transformerade figurationen (barn-väderfigurationen och barn-bifigurationen) till en process av förkroppsligade, upprepade responser och engagemang och ”svaranden-an”, genom vilka såväl glädjekänslor och oro som handlingar av förkroppsligad intensitet skapades.

Kunskapsbidrag

Denna avhandling ger fyra kunskapsbidrag. Den första kunskapsbidragande aspekten efterlyser ett annorlunda hållbarhetssetos. Därmed förespråkas en utvidgad föreställning om hållbarhet snarare än att betrakta det som något som människor arbetar i riktning mot. Hållbarhet kan då förstås bortom sociala, mänskliga och kognitiva angelägenheter. Det finns ett behov av multiplicitet och en mer generativ förståelse av hållbarhet som kan innefatta: hållbarhet som formande av livsbejakande figurationer (assemblage); hållbarhet som tillblivelser och ”svaranden-an”; hållbarhet som att bli påverkad snarare än något som kan bemästras och kontrolleras; hållbarhet som sammanflätning, sammankoppling och förhållande till miljön/den mer-än-mänskliga världen; och hållbarhet som en känsla av tillhörighet med naturen eller en viss miljö. Dessutom kan hållbarhet betraktas som en iterativ process av avterritorialisering och återterritorialisering inom vilken barnen erfar sig själva som natur och inte som skilda från den.

Ytterst implicerar detta en förändring från konceptualiseringen av hållbarhet som något som vi kan göra för oss själva, till vad vi behöver göra för att bli till med andra (dvs. andra arter och krafter), och bilda vad Deleuze och Guattari (1987) hänvisar till som livsbejakande figurationer. Därmed krävs en utvidgning av konceptualiseringen av hållbarhet så att den omfattar bildandet av spontana och uppkommande livsbejakande figurationer. Det finns ett behov av att ompröva vår plats i världen och vårt förhållande till den mer-än-mänskliga världen och dess livskraft.

Den andra kunskapsbidragande aspekten gäller att undervisning (i synnerhet i relation till förskola och hållbarhet) behöver berika och vidga sin kontext genom att medge att hela människan redan är intrasslad, förkroppsligad och affektiv, med andra arter och andra krafter inom en figuration (assemblage). Likväl talar vi ofta i konventionell förskola-och-hållbarhetsdiskurs om att lära oss att vara och att lära oss att vårda. Tillblivelse med och att lära sig att bli påverkad är inte välutvecklade föreställningar inom förskola och hållbarhet. Emellertid är att lära också att bli till, att ’lära med’ och att ’lära att bli påverkad av’, inom en figuration. Betraktat på det viset blir lärande inte enbart en kognitiv process att kontrollera och bemästra världen, utan det omfattar också hur man åter-territorialiserar eller av-territorialiserar (Deleuze and Guattari, 1987) och hur man blir till med andra. På samma sätt bör inte undervisning för hållbarhet enbart ses som överföring av förutbestämda kunskaper, utan snarare ett

pågående sökande efter generativa sätt att bli till. Lärare är inte enbart hegemoniska agenter, utan de blir snarare till med barnen. Lärare ska inte bara fokusera på barnen, utan snarare lära sig tillsammans med barnen och medvetet försöka undvika dikotomier.

Med stöd av posthumanistiska begrepp som figurationstänkande, distribuerad agens och tillblivelse, utmanar det tredje kunskapsbidragsområdet idén om skapandet av det rationella, etiska och agensfyllda barnet, och utforskar möjligheter av öppnande för det relationella barnet, och dess betydelse för hållbarhet. Ur ett post-antropocentriskt perspektiv är barnet inte ett förutbestämt autonomt och själv-privilegierat subjekt, utan snarare situerat inom en värld i agens och figuration i vilken han/hon blir till och påverkas av multipla aktörer och krafter. Pedagogiskt sett flyttas förskola och hållbarhet från det agentiska barnet till flera olika sätt att nå kunskap: affektivt lärande, förkroppsligat lärande och lärande med andra. Det agentiska relationella barnet är symbiotiskt och framträder ur sammanflätningar och interaktion/intra-aktioner.

Den fjärde kunskapsbidragsaspekten berör forskningspraktik (forskningens karaktär) inom förskola och hållbarhet. I stort sett kan tidigare forskningsriktningar inom förskola och hållbarhet anses bedriva forskning om barn, för barn och med barn. I denna avhandling för jag fram idén om att forska med den mer-än-mänskliga världen. På samma gång vill jag föra fram att forskning inom förskola och hållbarhet kan bli mer inkluderande när den inte begränsar sig till det humanistiska ramverket, genom att tillskriva betydelse till och utnyttja icke-mänskliga entiteter som en kunskapsskapande arena. Detta kan hjälpa oss att engagera oss i livskraften hos den icke-mänskliga aspekten av världen och tillåta oss att bli påverkade av och arbeta i en ny ekologi vilket Bennett (2010) hänvisar till som den politiska ekologin om ting och varande. Att anpassa sig till och engagera sig i den mer-än-mänskliga världens livskraft kräver experimenterande och metodologisk frihet. Forskare inom förskola och hållbarhet skulle kunna utnyttja olika tanketerritorier som finns i deras närhet, och ansatser som postkvalitativ forskning öppnar för sådana möjligheter.

I denna avhandling har jag utforskat post-antropocentriska möjligheter av miljömässig hållbarhet inom förskolepedagogik. I denna process har postkvalitativ forskning tjänat som en möjlig ansats till metodologisk kreativitet och därmed en möjlig väg till hållbarhet. Emellertid behöver implikationerna av en postkvalitativ forskningsansats utforskas ytterligare med avseende på begreppsbildning och hållbarhetsforskning (som i grunden strävar efter att

upprätthålla och bevara) och hållbar utveckling (som innebär att upprätthålla ständig förändring). Vår roll och position som forskare, forskningsobjektet, och den ontologiska och epistemologiska snäva linjen mellan de två, behöver undersökas grundligt och klargöras med fler empiriska studier.

Dock ska tilläggas att postkvalitativ forskning och dess medföljande ontologiska vändning ännu inte är etablerad inom förskolepedagogisk forskning. Följaktligen kommer ytterligare studier med ett postantropocentriskt angreppssätt föra med sig förändringar, vilka kan omfatta: institutionell förändring, forskningskulturell förändring och vetenskaplig förändring. Återigen nödvändiggör detta behovet av mer forskning som visar ansatsens möjligheter.

Likväl ska det framhållas att denna studie inte bara vittnar om begränsningarna av gängse sätt att conceptualisera hållbarhet, utan även kompletterar dem och erbjuder andra sätt att tänka om och praktisera hållbarhet. Det postantropocentriska angreppssättet presenteras därför inte som en universallösning till de aktuella ekologiska utmaningarna. Snarare hjälper det oss att decentralisera människan och se hennes intrasslade relationer med det icke-mänskliga.

References

- Abram, D. (1999). A more-than-human world. In A. Weston (Ed.). *An Invitation to Environmental Philosophy*. New York: Oxford University Press.
- Alaimo, S. (2016). *Exposed: Environmental Politics and Pleasures in Posthuman Times*. Minneapolis: University of Minnesota Press.
- Alaimo S. (2017a). *Gender: Matter*. New York: Macmillan Reference.
- Alaimo, S. (2017b). Your shell on acid: Material Immersion, Anthropocene Dissolves. In R. Grusin (Ed.), *Anthropocene feminism* (pp. 89–120). Minneapolis: University of Minnesota Press.
- Ärlemalm-Hagsér, E. (2013). Respect for nature—a prescription for developing environmental awareness in preschool. *CEPS Journal: Center for Educational Policy Studies Journal*, 3(1), 25-44.
- Arlemalm-Hagser, E., & Davis, J. (2014). “Examining the rhetoric: A comparison of how sustainability and young children’s participation and agency are framed in Australian and Swedish early childhood education curricula”. *Contemporary Issues in Early Childhood*, 15(3), 231–244.
- Ärlemalm-Hagsér, E., & Sundberg, B. (2016) Naturmöten och källsortering—En kvantitativ studie om lärande för hållbar utveckling i förskolan. *Nordic Studies in Science Education*, 12(2), 140-156.
- Barad, K. (2003). Posthumanist performativity: Toward an understanding of how matter comes to matter. *Signs: Journal of women in culture and society*, 28(3), 801-831.
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham: Duke University Press.
- Barrett, M. D., & Buchanan-Barrow, E. (2005) *Children's understanding of society*. Hove: Psychology Press.
- Barratt, R., Barratt-Hacking, E., & Black, P. (2014). Innovative approaches to early childhood education for sustainability in England. In J. Davis

- & S. Elliot (Eds.), *Research in early childhood education for sustainability: International perspectives and provocations* (pp. 225-247). London: Routledge.
- Battersby, M., & Bailin, S. (2011). Critical inquiry: Considering the context. *Argumentation*, 25(2), 243–253.
- Bennett, J. (2010). *Vibrant matter: A political ecology of things*. Durham, NC: Duke University Press.
- Blaikie, N. (2000). *Designing social research*. Cambridge, England: Polity Press.
- Bray, J. N., Lee, J., Smith, L., & Yorks, L. (2000). *Collaborative inquiry in practice: Action, reflection and making meaning*. London: SAGE.
- Blaise, M. (2014). Interfering with gendered development: A timely intervention. Special issue: Negotiation of gender in early childhood settings. *International Journal of Early Childhood*, 46(3) 317-326.
- Bone, J. (2013). The animal as fourth educator: A literature review of animals and young children in pedagogical relationships. *Australasian Journal of Early Childhood*, 38(2), 57-64.
- Bongaarts, J. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services, IPBES. *Population and Development Review*, 45(3), pp.680-681.
- Borg, F. (2017). *Caring for people and the planet: preschool children's knowledge and practices of sustainability*. (79 Doctoral thesis, comprehensive summary, Umeå University, Umeå. Retrieved on 27 January 2018 from <http://urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-138098> DiVA database.
- Borg, W. R., & Gall, M. D. (1989). *Educational research. An introduction* (5thed.). White Plains, NY: Longman.
- Bozalek, V., & Zembylas, M. (2016). Critical posthumanism, new materialisms and the affective turn for socially just pedagogies in higher education: part 2. *South African Journal of Higher Education*, 30(3), 193-200.
- Bradley, B., Sumsion, J., Stratigos, T., & Elwick, S. (2012). Baby events: Assembling descriptions of infants in family day care. *Contemporary Issues in Early Childhood*, 13(2), 141–153.
- Braidotti, R. (2002). *Metamorphoses: Towards a materialist theory of becoming*.

REFERENCES

- Cambridge, UK: Polity.
- Braidotti, R. (2006). Posthuman, all too human: Towards a new process ontology. *Theory, Culture and Society*, 23(7-8), 197-208.
- Braidotti, R. (2010). On putting the active back into activism. *New Formations*, 68(68), 42-57.
- Braidotti, R. (2013). *The posthuman*. Cambridge: Polity Press.
- Braidotti, R. (2016). Posthuman critical theory. In *Critical posthumanism and planetary futures* (pp. 13-32). New Delhi: Springer.
- Brundtland, G.H. (1987). *Report of the World Commission on environment and development: our common future*. Geneva: United Nations.
- Caiman, C. & Lundegård, I. (2014). "Pre-school children's agency in learning for Sustainable development". *Environmental Education Research*, 20(4), 437-459.
- Carson, R. 1965. *The sense of wonder*. New York: Harper and Row.
- Ceder, S. (2015). Cutting through water. Towards a posthuman theory of educational relationality (PhD Dissertation).Lund: Lund University. Accessed 2016-05-17 from <http://lup.lub.lu.se/record/8410784>
- Cielemecka O. & Daigle C. (2019). Posthuman Sustainability: An Ethos for our Anthropocentric Future. *Theory, Culture and Society*. DOI: 10.1177/0263276419873710
- Clark, V. (2012). Art practice as possible worlds. *International Journal of Child, Youth and Family Studies*, 3(2-3), 198-213.
- Clough, P.T. (2009) The new empiricism: affect and sociological method. *European Journal of Social Theory*, 12(1): 43-61.
- Common World Childhoods Research Collective. (2018). *Common World Childhoods Research Collective website*. Retrieved on 24 September 2016 from: <http://commonworlds.net/>
- Coole, D. (2013). Agentic capacities and capacious historical materialism: Thinking with new materialisms in the political sciences. *Millennium*, 41(3), 451-469.
- Crutzen, P. J., & Stoermer, E. F. (2000). Global change newsletter. *The Anthropocene*, 41, 17-18.

- Cutter-Mackenzie-Knowles, A., Malone, K., & Hacking, E. B. (2019). *Research handbook on childhoodnature: Assemblages of childhood and nature research*. Cham: Springer International.
- Cutter-Mackenzie, A., & Edwards, S. (2013). Toward a model for early Childhood environmental education: Foregrounding, developing and connecting knowledge through play-based learning. *The Journal of Environmental Education*, 44(3), 195-213. doi:10.1080/00958964.2012.751892
- Dahlbeck, J. (2012). On Childhood and the Good Will: thoughts on ethics and early childhood education. PhD thesis, Lund University.
- Dahlbeck, J. (2014). On Following Commands: A Philosophical Inquiry into the Governing Values of Swedish Early Childhood Education. *Studies in Philosophy and Education*. 33(5), 527-544.
- Dahlbeck, J. & Tallberg Broman, I. (2011). Ett bättre samhälle genom pedagogik: Högre värden och barnet som budbärare [A better society through education: values and the child as a messenger], in P. Williams & S. Sheridan (Eds) *Barns lärande i ett livslångt perspektiv*. Stockholm: Liber.
- Davis, J. (2008). What might education for sustainability look like in early childhood? A case for participatory, whole-of-setting approaches. In Pramling Samuelsson & Y. Kaga, (Eds.), *The contribution of early childhood education to a sustainable society*. UNESCO Report. Paris: France.
- Davies, B. (2014). *Listening to children: Being and becoming*. London: Routledge.
- Davis, J. & Elliott, S. (2014). *Research in early childhood education for sustainability: International perspectives and provocations*: London: Routledge.
- Deleuze, G. & Guattari, F. (1987). *A thousand plateaus: Capitalism and Schizophrenia*. London: Continuum.
- Deleuze, G. (1994). *Difference and Repetition*. London: Continuum.
- Duhn, I. (2012). Making 'place' for ecological sustainability in early childhood education. *Environmental Education Research*, 18(1), 19–29.
- Engdahl, I. (2012). Doing friendship during the second year of life in a Swedish preschool. *European Early Childhood Education Research Journal*, 20(1), 83-98.
- Engdahl, I. (2015). Early Childhood Education for Sustainability: The OMEP World Project. *International Journal of Early Childhood*, 47(3), 347-366.

REFERENCES

- Engdahl, I., & Ärlemalm-Hagsér, E. (2014). Education for sustainability in Swedish preschools. In J. Davis & S. Elliot (Eds.), *Research in early childhood education for sustainability: International perspectives and provocations* (pp. 208–224). London: Routledge.
- Engdahl, I., & Rabušicová, M. (2010). *Children's Voices about the State of the Earth and Sustainable Development*. Paper presented at the Report to the OMEP World Assembly and World Congress.
- Ergazaki, M., & Andriotou, E. (2010). From “forest fires” and “hunting” to disturbing “habitats” and “food chains”: Do young children come up with any ecological interpretations of human interventions within a forest? *Research in Science Education*, *40*(2), 187-201.
- Ferrando, F. (2016). The Party of the Anthropocene: Post-Humanism, Environmentalism and The Post-Anthropocentric Paradigm Shift. *Relations: Beyond Anthropocentrism*, *4*(2), 159-173.
- Ferrante, A., & D. Sartori (2016). From Anthropocentrism to Post-Humanism in the Educational Debate. *Relations*. *4*(2), 175–194. DOI: 10.7358/rela-2016-002-fesa.
- Fink, A. (2005). *Conducting Research Literature Reviews: From the Internet to Paper* (2nd ed.). Thousand Oaks, California: Sage Publications.
- Fox, N. J. & Alldred, P. (2015). New materialist social inquiry: designs, methods and the Research-assemblage. *International Journal of Social Research Methodology*, *18*(4), 399-414.
- Fox, N. J., & Alldred, P. (2018). Mixed methods, materialism and the micropolitics of the research-assemblage. *International Journal of Social Research Methodology*, *21*(2), 191-204.
- Gambino, A., Davis, J. & Rowntree, N. (2009). Young children learning for the environment: Researching a forest adventure. *Australian Journal of Environmental Education* *25*: 83–94. DOI: <https://doi.org/10.1017/S0814062600000422>
- Gannon, S. (2016). ‘Local Girl Befriends Vicious Bear’: Unleashing Educational Aspiration Through a Pedagogy of Material-Semiotic Entanglement. In *Posthuman research practices in education* (pp. 128-148). Palgrave Macmillan, London.
- Gannon, S. (2017). Saving squawk? Animal and human entanglement at the edge of the lagoon. *Environmental Education Research*, *23*(1), 91–110.

- Gibson, K., Rose, D. B., & Fincher, R. (2015). *Manifesto for living in the Anthropocene*. Brooklyn: Punctum.
- Giugni, M. (2011). Becoming worldly with?: An encounter with the early years learning framework. *Contemporary Issues in Early Childhood*, 12(1), 11-27.
- Greig A., D., Taylor, J., & MacKay (2013). *Doing Research with Children: A Practical Guide*. SAGE; London.
- Grodzińska-Jurczak, M., Stepska, A., Nieszporek, K., & Bryda, G. (2006). Perception of environmental problems among pre-school children in Poland. *International Research in Geographical & Environmental Education*, 15(1), 62-76.
- Guest, G., Namey, E. E., & Mitchell, M. L. (2012). *Collecting qualitative data: A field manual for applied research*. Los Angeles, CA: Sage.
- Hackett, A., & Somerville, M. (2017). Posthuman literacies: Young children moving in time, place and more-than-human worlds. *Journal of Early Childhood Literacy*, 17(3), 374-391.
- Hadzigeorgiou, Y., Prevezanou, B., Kabouropoulou, M., & Konsolas, M. (2011). Teaching about the importance of trees: A study with young children. *Environmental Education Research*, 17(4), 519-536.
- Halldén, G. (Ed.). (2011). *Barndomens skogar*. Om barn och natur och barns natur [Forests of the childhood. Children and nature and children's nature]. Stockholm, Sweden: Carlsson.
- Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist studies*, 14(3), 575-599.
- Haraway, D. (2008). *When Species Meet* (Minneapolis, MN: University of Minnesota Press).
- Haraway, D. J. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Durham, Duke University Press.
- Hedefalk, M., Almqvist J. & Östman L. (2014). Education for sustainable development in early childhood education: A review of the research literature. *Environmental Education*, 21(7), 975-990.
- Hultman, K. (2011). Barn, linjaler och andra aktörer: Posthumanistiska perspektiv på subjektsskapande och materialitet i förskola/skola (Unpublished doctoral dissertation). Stockholm: Stockholms

REFERENCES

- Universitet.
- Inoue, M., O'Gorman, L., & Davis, J. (2016). Investigating Early Childhood Teachers' Understandings of and Practices in Education for Sustainability in Queensland: A Japan-Australia Research Collaboration. *Australian Journal of Environmental Education*, 32(02), 174-191.
- IPCC, Intergovernmental Panel on Climate Change (2018) Special report on global warming of 1.5 °C (SR15). Retrieved on 25 December 2018 from <http://www.ipcc.ch/report/sr15/>.
- Ives, C. D., Abson, D. J., von Wehrden, H., Dorninger, C., Klaniecki, K., & Fischer, J. (2018). Reconnecting with nature for sustainability. *Sustainability science*, 13(5), 1389-1397.
- Ji, O., & Stuhmcke, S. (2014). The project approach in early childhood education for sustainability. In J. Davis & S. Elliot (Eds.), *Research in early childhood education for sustainability: International perspectives and provocations* (p. 158). London: Routledge.
- Kahriman-Öztürk D., Olgan R. & Güler T. (2012). Preschool children's ideas on sustainable development: How preschool children perceive three pillars of sustainability with the regard to 7R. *Educational Sciences: Theory and Practice*. 12(4), 2987-2995. ERIC.
- Karoly, L.A., Kilburn, M.R., & Cannon, J.S. (2005). Early Childhood Interventions: Proven Results, Future Promise. RAND Corporation, Santa Monica, CA.
- Kellett, M. (2011). "Empowering children and young people as researchers: Overcoming barriers and building capacity". *Child Indicators Research*, 4(2), 205–219.
- Kopnina, H. (2014). Revisiting education for sustainable development (ESD): Examining anthropocentric bias through the transition of environmental education to ESD. *Sustainable development*, 22(2), 73-83.
- Krippendorff, K. (1980). *Content analysis: An introduction to its methodology*. London: Sage.
- Kuby, C. R., Spector, K., & Thiel, J. J. (Eds.). (2018). *Posthumanism and literacy education: Knowing/ becoming/ doing literacies*. New York, Routledge.
- Lather, P. (2009). Getting lost: Feminist efforts toward a double (d) science. *Frontiers: A Journal of Women Studies*, 30(1), 222-230.

- Lather, P. (2012). *Getting lost: Feminist efforts toward a double (d) science*. Albany, Suny Press.
- Lather, P., & St. Pierre, E. A. (2013). Post-qualitative research. *International Journal of Qualitative Studies in Education*, 26(6), 629-633.
- Latour, B. (1996). On actor-network theory: a few clarifications. *Soziale Welt*, 47(4), 369-381.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Lenz-Taguchi, H. (2010). *Going beyond the theory/practice divide in early childhood education: Introducing an intra-active pedagogy*. London: Routledge.
- Lenz Taguchi, H. (2014). New materialisms and play. In L. Brooker, M. Blaise, & S. Edwards (Eds.), *The Sage handbook of play and learning in early childhood* (pp. 79-90). London: Sage.
- Letts W. & Sandlin J. (2017). Grappling with curricular and pedagogical Entanglements. *Journal of Curriculum and Pedagogy*, 14(3), 181-183, DOI:10.1080/15505170.2017.1419774.
- Lotz-Sisitka, H., Wals, A. E., Kronlid, D., & McGarry, D. (2015). "Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction". *Current Opinion in Environmental Sustainability*, 16, 73-80.
- Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder* (2nd ed.). Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Mackey, G. (2014). Valuing agency in young children: Teachers rising to the challenge of sustainability in the Aotearoa New Zealand early childhood context. In J. Davis & S. Elliot (Eds.), *Research in early childhood education for sustainability: International perspectives and provocations* (pp.180–193). London: Routledge.
- MacLure, M. (2010). "Qualitative Inquiry: Where are the Ruins?" Keynote speech presented at the New Zealand Association for Research in Education Conference, Auckland, New Zealand, December 6–9, 2010.
- MacLure, M. (2011). Qualitative inquiry: Where are the ruins? *Qualitative Inquiry*, 17(10), 997-1005.
- MacLure, M. (2013). Researching without representation? Language and materiality in post- qualitative methodology. *International journal of qualitative studies in education*, 26(6), 658-667.

REFERENCES

- MacRae, C. (2012). Encounters with a Life (less) Baby Doll: rethinking relations of agency through a collectively lived moment. *Contemporary issues in early childhood*, 13(2), 120-131.
- Malone, K. (2013). 'The future lies in our hands': Children as researchers and environmental change agents in designing a child-friendly neighborhood. *Local Environment*, 18(3), 372-395.
- Malone, K. (2015). Posthumanist Approaches to Theorising Children's Human-Nature Relations. In K. Nairn & P. Kraftl (Eds.), *Space, Place and Environment, Volume 3, Geographies of Children and Young People Series*, (pp. 1-22). London: Springer.
- Malone, K. (2017). Ecological posthumanist theorising: Grappling with child-dog-bodies. In K. Malone, S. Truong, & T. Gray (Eds.), *Reimagining sustainability in precarious times* (pp. 161-172). Singapore: Springer. Doi: 10.1007/978-981-10-2550-1_11.
- Manning, E., & Massumi, B. (2014). *Thought in the act: Passages in the ecology of experience*. Minneapolis: University of Minnesota Press.
- Massumi, B. (1987) *Realer Than Real: The Simulacrum According to Deleuze And Guattari*. Retrieved on 22 January 2019 from http://www.anu.edu.au/HCR/first_and_last/works/realer.htm
- Massumi, B. (2002) *Parables for the virtual: movement, affect, sensation*. Durham, Duke University Press.
- Mazzei, L. A. (2016). Voice without a subject. *Cultural Studies Critical Methodologies*, 16(2), 1-11.
- McKenzie M. & Bieler A. (2016). *Critical Education and Sociomaterial Practice: Narration, Place and the Social*. Bern: Peter Lang Press.
- Murris, K. (2017). Reconfiguring educational relationality in education: the educator as pregnant stingray. *Journal of Education*, 69,117-138
- Musser, L. M., & Diamond, K. E. (1999). The children's attitudes toward the environment scale for preschool children. *The Journal of Environmental Education*, 30(2), 23-30. Doi:10.1080/00958969909601867
- Nordstrom, S. (2015). A data assemblage. *International Review of Qualitative Research*, 8(2), 166-193.
- Nordstrom, S. (2018). Antimethodology: Postqualitative Generative Conventions. *Qualitative Inquiry* 28(4), 215-226. DOI:10.1177/107780041770446946.
- Nxumalo, F. (2018). Stories for living on a damaged planet: Environmental

- education in a pre-school classroom. *Journal of Early Childhood Research*, 16(2), 148–159.
- Nxumalo, F., & Cedillo, S. (2017). Decolonizing place in early childhood studies: Thinking with Indigenous onto-epistemologies and Black feminist geographies. *Global studies of childhood*, 7(2), 99-112.
- Nxumalo, F., & Pacini-Ketchabaw, V. (2017). ‘Staying with the trouble’ in child-insect educator common worlds. *Environmental Education Research*, 23(10), 1414-1426.
- Olsson, L. M. (2009). *Movement and experimentation in young children’s learning: Deleuze and Guattari in early childhood education*. London/New York: Routledge.
- O’Gorman, L., & Davis, J. (2013). Ecological footprinting: its potential as a tool for change in preservice teacher education. *Environmental Education Research*, 19(6), 779-791.
- Pacini-Ketchabaw, V., A. Taylor, & M. Blaise. (2015). *De-Centring the Human in Multispecies Ethnographies*. In Posthuman Research Practices in Education, edited by C. Taylor and C. Hughes, 149-167. Houndmills: Palgrave Macmillan.
- Pacini-Ketchabaw, V., S. Kind, & L. Kocher. (2015). *Encounters with Materials in Early Childhood Education*. New York: Routledge.
- Pacini-Ketchabaw, V., & Taylor A. (2016). “Common World Childhoods”. In H. Montgomery (Ed.) *Oxford Bibliographies in Childhood Studies*. New York: Oxford University Press.
doi:10.1093/OBO/9780199791231-0174.
- Palmer, J. (1995). Environmental thinking in the early years; understanding and misunderstanding of concepts related to waste management. *Environmental Education Research*, 1(1), 35-45.
- Palmer, J. A., Grodzinska-Jurczak, M., & Suggate, J. (2003). Thinking about waste: Development of English and Polish children’s understanding of concepts related to waste management. *European Early Childhood Education Research Journal*, 11(2), 117–139.
- Palmer, J., & Suggate, J. (2004). The development of children’s understandings of distant places and environmental issues: Report of a UK longitudinal study of the development of ideas between the ages of 4 and 10 years. *Research Papers in Education*, 19(2), 205-237.
- Pedersen, H. (2019). *Schizoanalysis and Animal Science Education*. London: Bloomsbury Academic.

REFERENCES

- Poe, A. (2011). Diana Coole and Samantha Frost (Eds), *New Materialisms: Ontology, Agency, and Politics*. *Journal of French and Francophone Philosophy*, 19(1), 153-164.
- Piaget, J. (1997). Development and learning. In M. Gauvain & M. Cole (Eds.), *Readings of the development of children* (pp. 19–28). New York: W.H. Freeman and Company.
- Phillips, L. (2014). I want to do real things. In J. Davis & S. Elliot (Eds.), *Research in early childhood education for sustainability: International perspectives and provocations* (pp. 194–207). London: Routledge.
- Powell, S., & Somerville, M. (2018). Drumming in excess and chaos: Music, literacy and sustainability in early years learning. *Journal of Early Childhood Literacy*, doi: 10.1177/146879841879260.
- Pramling Samuelsson, I. P. (2011). Why we should begin early with ESD: The role of early childhood education. *International Journal of Early Childhood*, 43(2), 103-118.
- Pramling Samuelsson, I., & Kaga, J. (2008). *The contribution of early childhood education to a sustainable society*. UNESCO: France.
- Prout, A. (2005). *The future of childhood*. London: RoutledgeFalmer.
- Rautio, P., & Winston, J. (2015). Things and children in play—improvisation with language and matter. *Discourse: Studies in the Cultural Politics of Education*, 36(1), 15-26.
- Reinertsen, A. B. (2016). *Becoming Earth*. In *Becoming Earth* (pp. 1-13). Rotterdam, AN: Sense Publishers.
- Reinertsen, A. B. (2017). The A/Un/grammatical child/hood/s and writing: Nature/culture edusemiotic entangling with affective outside encounters and sustainability events to come. *Qualitative Inquiry*, 23(3), 240-248.
- Renold, E., & Mellor, D. (2013). Deleuze and Guattari in the nursery: Towards a multi-sensory mapping of gendered bodies and becomings. In R. Coleman & J. Ringrose (Eds.), *Deleuze and research methodologies* (pp. 23–41). Edinburgh: Edinburgh University Press.
- Richardson, L., & St Pierre, E. (2008). A method of inquiry. *Collecting and interpreting qualitative materials*, 3(4), 473.
- Ritchie, J. (2013). Sustainability and relationality within early childhood care and education settings in Aotearoa New Zealand. *International Journal of Early Childhood*, 45(3), 307–326.

- Robertson, J. (2008). I Ur och Skur “Rain or Shine”: Swedish Forest Schools. Retrieved on 26 september 2017 from www.friluftsfamjandet.se/c/document_library/get_file?folderId=39265&name=DLFE-5521.pdf
- Rockström, J., Steffen, W. L., Noone, K., Persson, Å., Chapin III, F. S., Lambin, E., ... & Nykvist, B. (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and society*, 14(2), 32. Retrieved on 7 january 2012 from <http://www.ecologyandsociety.org/vol14/iss2/art32/>
- Roelvink, G. and Zolkos, M. (2015). Posthumanist Perspectives on Affect: Framing the Field. *Angelaki: Journal of the Theoretical Humanities*, 20(3), 1-20.
- Rousseau, J. J. (1979). *Emile, or On Education (1762)*. Trans. Allan Bloom. New York: Basic Books.
- Silverman, D. (Ed.). (2011). *Qualitative research: Issues of Theory, Method and Practice (3rd ed.)*. Thousand Oaks, CA: Sage.
- Scantlebury, K., & Milne, C. (2019). *Material practice and materiality: Too long ignored in science education*. Switzerland: Springer.
- Scantlebury, K. & Milne, C. (2020). Beyond dichotomies: 21st century post humanities ethics for science education using a Baradian perspective. In K. Otrell-Cass, M. Ryu & M. Andree (Eds.). *Examining ethics in contemporary science education research-being responsive and responsible*. New York: Springer.
- Siraj-Blatchford, I., Taggart, B., Sylva, K., Sammons, P., & Melhuish, E. (2008). Towards the transformation of practice in early childhood education: the effective provision of pre-school education (EPPE) project. *Cambridge Journal of Education*, 38(1), 23-36.
- Siraj-Blatchford, I. (2009). Conceptualising progression in the pedagogy of Play and Sustained Shared Thinking in early childhood education: A Vygotskian perspective. *Educational and Child Psychology*, 26(2), 77-89.
- Siraj-Blatchford, J., Smith, K. & Pramling Samuelson, I. (2010). Education for Sustainable Development in the Early Years. *Gothenburg: World Organization for Early Childhood Education. (OMEP)*. Retrieved on 10 October 2015 from

REFERENCES

- http://www.omep.org.gu.se/English/news/news_detail//newbook-for-practitioners.cid952209
- Skolverket. (2010). *Läroplan för förskolan Lpfö 98*. Stockholm: Skolverket.
- Skolverket. (2018). Curriculum for the preschool Lpfö 18. Stockholm, Sweden: The Swedish National Agency for Education. Retrieved on 15 December 2018 from <http://www.skolverket.se>
- Sobel, D. (1996). *Beyond ecophobia: Reclaiming the heart in nature education*. Great Barrington, MA: The Orion Society.
- Sobel, D. (2008). *Children and nature: Design principles for educators*. Portland, ME: Stenhouse Publishers.
- Somerville, M. (2011). Becoming-frog: Learning place in primary school. In M. Somerville, B. Davis, K. Power, S. Gannon, & P. de Carteret (Eds.), *Place, pedagogy, change* (pp. 65–80). Rotterdam/Boston/Taipei: Sense Publishers.
- Somerville, M. (2015). Environment and Sustainability Education: A Fragile History of the Present. In Wyse D. et.al. (2015). *The SAGE Handbook of Curriculum, Pedagogy and Assessment*. London; Sage Publication.
- Somerville, M., & Green, M. (2015). *Children, place and sustainability*. Basingstoke: Palgrave MacMillan.
- Somerville, M., & Williams, C. (2015). Sustainability education in early childhood: An updated review of research in the field. *Contemporary Issues in Early Childhood*, 16(2), 102-117.
- Strange, T., & Bayley, A. (2008). *Sustainable development: Linking economy, society, environment*. OECD Insights, OECD Publishing.
Doi:10.1787/9789264055742-en
- St. Pierre, E. A. (2015). Practices for the “new” in the new empiri-cisms, the new materialisms, and post qualitative inquiry. In N. Denzin & M. Giardina (Eds.), *Qualitative inquiry and the politics of research* (pp. 75-95). Walnut Grove, CA: Left Coast Press.
- St Pierre, E. A. (2018). Post qualitative inquiry in an ontology of immanence. *Qualitative Inquiry*, doi: 10.1177/1077800418772634
- Taylor, A. (2013). *Reconfiguring the Natures of Childhood*. London: Routledge.
- Taylor, A. (2017). Beyond stewardship: Common world pedagogies for the Anthropocene. *Environmental Education Research*, 23(10), 1–14.
- Taylor, A. (2018). Engaging with the Conceptual Tools and Challenges of Poststructural Theories. In *International Handbook of Early Childhood*

- Education* (pp. 91-115). Springer, Dordrecht.
- Taylor, A., & Pacini-Ketchabaw, V. (2015). Learning with children, ants, and worms in the Anthropocene: Towards a common world pedagogy of multispecies vulnerability. *Pedagogy, Culture & Society*, 23(4), 507-529.
- Taylor, A., & Pacini-Ketchabaw, V. (2018). *The common worlds of children and animals: Relational ethics for entangled lives*. London: Routledge.
- Taylor, A., Pacini-Ketchabaw, V., & Blaise, M. (2012). "Children's Relations to the More-than-Human World". *Contemporary Issues in Early Childhood*, 13(2), 81-85.
- Taylor, C., & Hughes, C. (Eds.). (2016). *Posthuman research practices in education*. London: Palgrave.
- Tesar M. (2017). Tracing notions of sustainability in urban childhoods. In Malone K., & Truong S., Gray (Eds.). *Reimagining Sustainability in Precarious Times*, (pp.115-127). New York: Springer.
- Tibury, D. (1994). "The critical learning years for environmental education". In Environmental education at the early childhood level, edited by Wilson R., 11-13. Washington DC: North American Association for Environmental Education.
- Tilbury, D., Coleman, V., & Garlick, D. (2005). *A National review of environmental education and its contribution to sustainability in Australia: school education*. Canberra, ACT: Department of the Environment and Heritage.
- Timmerman, N., & Ostertag, J. (2011). Too many monkeys jumping in their heads: Animal lessons within young children's media. *Canadian Journal of Environmental Education*, 16, 59-75.
- Tsoubaris, D., & Georgopoulos, A. (2013). Gauging the Ppotential of socially Critical environmental education (EE): Examining local environmental problems through children's perspective. *Journal for Critical Education Policy Studies*, 11(4), 132-158.
- UNESCO. (2016a). *Education for people and planet: Creating sustainable futures for all*. Paris: UNESCO.
- UNESCO. (2016b). *Global education monitoring report: Education for people and planet*. Paris: UNESCO.
- UNICEF. (2014). The challenges of climate change: Children on the front line. Retrieved on 15. September 2018 from https://www.unicef.org/publications/index_74647.html
- Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: Harvard University

REFERENCES

- Press.
- Watts, N., Adger, W. N., Agnolucci, P., Blackstock, J., Byass, P., Cai, W., ... & Cox, P. M. (2015). Health and climate change: policy responses to protect public health. *The Lancet*, *386*(10006), 1861-1914.
- Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS quarterly*, *26*(2), xiii-xxiii.
- Weldemariam, K. (2017). Challenging and expanding the notion of sustainability within early childhood education: Perspectives from post-humanism and/or new materialism. In O. Franck & C. Osbeck (Eds.), *Ethical literacies and education for sustainable development: Young people, subjectivity and democratic participation* (pp. 105-126): Palgrave Macmillan
- Weldemariam, K., Boyd, D., Hirst, N., Sageidet, B. M., Browder, J. K., Grogan, L., Hughes F.,(2017). A critical analysis of concepts associated with sustainability in early childhood curriculum frameworks across five national contexts. *International Journal of Early Childhood*. *49*(3), 333-351.
- Letts W. & Sandlin J. (2017). Grappling with curricular and pedagogical Entanglements. *Journal of Curriculum and Pedagogy*, *14*(3), 181-183.
- Wilson, R. A. (1992). "The importance of environmental education at the early Childhood Level". *International Journal of Environmental Education and Information*. *12*(1), 15-24.
- Wilson, Ruth A. (1996). *Starting Early Environmental Education During the Early Childhood Years* (ERIC Digest). Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education (ERIC Identifier ED 402147).
- Young, T., & Cutter-MacKenzie, A. (2014). An AuSSI early childhood adventure: Early childhood educators and researchers actioning change. In J. Davis & S. Elliot (Eds.), *Research in early childhood education for sustainability: International perspectives and provocations* (pp. 143–157). London: Routledge.

APPENDICES

Part A

Article I

Weldemariam, K. (2017). Challenging and expanding the notion of sustainability within early childhood education: Perspectives from post-humanism and/or new materialism. In O. Franck & C. Osbeck (Eds.), *Ethical literacies and education for sustainable development: Young people, subjectivity and democratic participation* (pp. 105-126): Palgrave Macmillan

Article II

Weldemariam, K., Boyd, D., Hirst, N., Sageidet, B. M., Browder, J. K., Grogan, L., Hughes F.,(2017). A critical analysis of concepts associated with sustainability in early childhood curriculum frameworks across five national contexts. *International Journal of Early Childhood*. 49(3), 333-351.

Article III

Kassahun Weldemariam (2020). Learning with Vital Materialities: Weather Assemblage Pedagogies in Early Childhood Education. Submitted.

Article IV

Weldemariam, K. (2019). 'Becoming-with bees': generating affect and response-abilities with the dying bees in early childhood education. *Discourse: Studies in the Cultural Politics of Education*, DOI: 10.1080/01596306.2019.1607402

Tidigare utgåvor:

Editors: Kjell Härnqvist and Karl-Gustaf Stukát

1. KARL-GUSTAF STUKÁT *Lekskolans inverkan på barns utveckling*. Stockholm 1966
2. URBAN DAHLLÖF *Skoldifferentiering och undervisningsförlopp*. Stockholm 1967
3. ERIK WALLIN *Spelling. Factorial and experimental studies*. Stockholm 1967
4. BENGT-ERIK ANDERSSON *Studies in adolescent behaviour. Project Yg, Youth in Göteborg*. Stockholm 1969
5. FERENCE MARTON *Structural dynamics of learning*. Stockholm 1970
6. ALLAN SVENSSON *Relative achievement. School performance in relation to intelligence, sex and home environment*. Stockholm 1971
7. GUNNI KÄRRBY *Child rearing and the development of moral structure*. Stockholm 1971

Editors: Urban Dahllöf, Kjell Härnqvist and Karl-Gustaf Stukát

8. ULF P. LUNDGREN *Frame factors and the teaching process. A contribution to curriculum theory and theory on teaching*. Stockholm 1972
9. LENNART LEVIN *Comparative studies in foreign-language teaching*. Stockholm 1972
10. RODNEY ÅSBERG *Primary education and national development*. Stockholm 1973
11. BJÖRN SANDGREN *Kreativ utveckling*. Stockholm 1974
12. CHRISTER BRUSLING *Microteaching - A concept in development*. Stockholm 1974
13. KJELL RUBENSON *Rekrytering till vuxenutbildning. En studie av kortutbildade yngre män*. Göteborg 1975
14. ROGER SÄLJÖ *Qualitative differences in learning as a function of the learner's conception of the task*. Göteborg 1975
15. LARS OWE DAHLGREN *Qualitative differences in learning as a function of content-oriented guidance*. Göteborg 1975
16. MARIE MÄNSSON *Samarbete och samarbetsförmåga. En kritisk granskning*. Lund 1975
17. JAN-ERIC GUSTAFSSON *Verbal and figural aptitudes in relation to instructional methods. Studies in aptitude - treatment interactions*. Göteborg 1976
18. MATS EKHOLM *Social utveckling i skolan. Studier och diskussion*. Göteborg 1976

19. LENNART SVENSSON *Study skill and learning*. Göteborg 1976

20. BJÖRN ANDERSSON *Science teaching and the development of thinking*. Göteborg 1976

21. JAN-ERIK PERNEMAN *Medvetenhet genom utbildning*. Göteborg 1977

Editors: Kjell Härnqvist, Ference Marton and Karl-Gustaf Stukát

22. INGA WERNERSSON *Könsdifferentiering i grundskolan*. Göteborg 1977
23. BERT AGGESTEDT & ULLA TEBELIUS *Barns upplevelser av idrott*. Göteborg 1977
24. ANDERS FRÄNSSON *Att rädas prov och att vilja veta*. Göteborg 1978
25. ROLAND BJÖRKBERG *Föreställningar om arbete, utveckling och livsrytm*. Göteborg 1978
26. GUNILLA SVINGBY *Läroplaner som styrmedel för svenske obligatoriska skola. Teoretisk analys och ett empiriskt bidrag*. Göteborg 1978
27. INGA ANDERSSON *Tankestilar och hemmiljö*. Göteborg 1979
28. GUNNAR STANGVIK *Self-concept and school segregation*. Göteborg 1979
29. MARGARETA KRISTIANSSON *Matematikkunskaper Lgr 62, Lgr 69*. Göteborg 1979
30. BRITT JOHANSSON *Kunskapsbehov i omvårdnadsarbete och kunskapskrav i vårdutbildning*. Göteborg 1979
31. GÖRAN PATRIKSSON *Socialisation och involvering i idrott*. Göteborg 1979
32. PETER GILL *Moral judgments of violence among Irish and Swedish adolescents*. Göteborg 1979
33. TAGE LJUNGBLAD *Förskola - grundskola i samverkan. Förutsättningar och hinder*. Göteborg 1980
34. BERNER LINDSTRÖM *Forms of representation, content and learning*. Göteborg 1980
35. CLAES-GÖRAN WENESTAM *Qualitative differences in retention*. Göteborg 1980
36. BRITT JOHANSSON *Pedagogiska samtal i vårdutbildning. Innehåll och språkbruk*. Göteborg 1981
37. LEIF LYBECK *Arkimedes i klassen. En ämnespedagogisk berättelse*. Göteborg 1981
38. BIÖRN HASSELGREN *Ways of apprehending children at play. A study of pre-school student teachers' development*. Göteborg 1981

39. LENNART NILSSON *Yrkesutbildning i nutidshistoriskt perspektiv. Yrkesutbildningens utveckling från skräväsändets uppbörande 1846 till 1980-talet samt tankar om framtida inriktning.* Göteborg 1981

40. GUDRUN BALKE-AURELL *Changes in ability as related to educational and occupational experience.* Göteborg 1982

41. ROGER SÄLJÖ *Learning and understanding. A study of differences in constructing meaning from a text.* Göteborg 1982

42. ULLA MARKLUND *Droger och påverkan. Elevalans som utgångspunkt för drogundervisning.* Göteborg 1983

43. SVEN SETTERLIND *Avslappningsstråning i skolan. Forskningsöversikt och empiriska studier.* Göteborg 1983

44. EGIL ANDERSSON & MARIA LAWENIUS *Lärares uppfattning av undervisning.* Göteborg 1983

45. JAN THEMAN *Uppfattningar av politisk makt.* Göteborg 1983

46. INGRID PRAMLING *The child's conception of learning.* Göteborg 1983

47. PER OLOF THÅNG *Vuxenlärares förhållningsätt till deltagarerbaheter. En studie inom AMU.* Göteborg 1984

48. INGE JOHANSSON *Fritidspedagog på fritidsbhem. En yrkesgrupps syn på sitt arbete.* Göteborg 1984

49. GUNILLA SVANBERG *Medansvar i undervisning. Metoder för observation och kvalitativ analys.* Göteborg 1984

50. SVEN-ERIC REUTERBERG *Studiemedel och rekrytering till högskolan.* Göteborg 1984

51. GÖSTA DAHLGREN & LARS-ERIK OLSSON *Läsning i barnperspektiv.* Göteborg 1985

52. CHRISTINA KÄRRQVIST *Kunskapsutveckling genom experimentcentrerade dialoger i ellära.* Göteborg 1985

53. CLAES ALEXANDERSSON *Stabilitet och förändring. En empirisk studie av förhållandet mellan skolkunskap och vardagsvetande.* Göteborg 1985

54. LILLEMOR JERNQVIST *Speech regulation of motor acts as used by cerebral palsied children. Observational and experimental studies of a key feature of conductive education.* Göteborg 1985

55. SOLVEIG HÄGGLUND *Sex-typing and development in an ecological perspective.* Göteborg 1986

56. INGRID CARLGREN *Lokalt utvecklingsarbete.* Göteborg 1986

57. LARSSON, ALEXANDERSSON, HELMSTAD & THÅNG *Arbetsupplevelse och utbildningsyn hos icke facklärla.* Göteborg 1986

58. ELVI WALLDAL *Studierande vid gymnasieskolans världlinje. Förväntad yrkesposition, rollpåverkan, själuppfattning.* Göteborg 1986

Editors: Jan-Eric Gustafsson, Ference Marton and Karl-Gustaf Stukát

59. EIE ERICSSON *Foreign language teaching from the point of view of certain student activities.* Göteborg 1986

60. JAN HOLMER *Högre utbildning för lågutbildade i industrin.* Göteborg 1987

61. ANDERS HILL & TULLIE RABE *Psykiskt utvecklingsstörda i kommunal förskola.* Göteborg 1987

62. DAGMAR NEUMAN *The origin of arithmetic skills. A phenomenographic approach.* Göteborg 1987

63. TOMAS KROKSMARK *Fenomenografisk didaktik.* Göteborg 1987

64. ROLF LANDER *Utvärderingsforskning - till vilken nytta? Göteborg 1987*

65. TORGNY OTTOSSON *Map-reading and wayfinding.* Göteborg 1987

66. MAC MURRAY *Utbildningsexpansion, jämlikhet och avlänkning.* Göteborg 1988

67. ALBERTO NAGLE CAJES *Studievalet ur den väljandes perspektiv.* Göteborg 1988

68. GÖRAN LASSBO *Mamma - (Pappa) - barn. En utvecklingssekologisk studie av socialisation i olika familjetyper.* Göteborg 1988

69. LENA RENSTRÖM *Conceptions of matter. A phenomenographic approach.* Göteborg 1988

70. INGRID PRAMLING *Att lära barn lära.* Göteborg 1988

71. LARS FREDHOLM *Praktik som bärare av undervisnings innebäll och form. En förklaringsmodell för uppkomst av undervisningshandlingar inom en totalförsvarsorganisation.* Göteborg 1988

72. OLOF F. LUNDQUIST *Studiestöd för vuxna. Utveckling, utnyttjande, utfall.* Göteborg 1989

73. BO DAHLIN *Religionen, själen och livets mening. En fenomenografisk och existensfilosofisk studie av religionsundervisningens villkor.* Göteborg 1989

74. SUSANNE BJÖRKDAHL ORDELL *Socialarbetare. Bakgrund, utbildning och yrkesliv.* Göteborg 1990

75. EVA BJÖRCK-ÅKESSON *Measuring Sensation Seeking.* Göteborg 1990

76. ULLA-BRITT BLADINI *Från hjälpskolelärare till förändringsagent. Svensk speciallärautbildning 1921-1981 relaterad till specialundervisningens utveckling och förändringar i speciallärares yrkesuppgifter.* Göteborg 1990

77. ELISABET ÖHRN *Könsmönster i klassrumsinteraktion. En observations- och intervjustudie av högstadielärares lärarkontakter.* Göteborg 1991
78. TOMAS KROKSMARK *Pedagogikens vägar till dess första svenska professur.* Göteborg 1991

Editors: Ingemar Emanuelsson, Jan-Eric Gustafsson and Ference Marton

79. ELVI WALLDAL *Problembaserad inläring. Utvärdering av påbyggnadslinjen Utbildning i öppen hälso- och sjukvård.* Göteborg 1991
80. ULLA AXNER *Visuella perceptionsvärigheter i skolperspektiv. En longitudinell studie.* Göteborg 1991
81. BIRGITTA KULLBERG *Learning to learn to read.* Göteborg 1991
82. CLAES ANNERSTEDT *Idrottslärarna och idrottsämnet. Utveckling, mål, kompetens - ett didaktiskt perspektiv.* Göteborg 1991
83. EWA PILHAMMAR ANDERSSON *Det är vi som är dom. Sjuksköterskestuderandes föreställningar och perspektiv under utbildningstiden.* Göteborg 1991
84. ELSA NORDIN *Kunskaper och uppfattningar om maten och dess funktioner i kroppen. Kombinerad enkät- och intervjustudie i grundskolans årskurser 3, 6 och 9.* Göteborg 1992
85. VALENTIN GONZÁLEZ *On human attitudes. Root metaphors in theoretical conceptions.* Göteborg 1992
86. JAN-ERIK JOHANSSON *Metodikämnet i förskolläraryrket. Bidrag till en traditionsbestämning.* Göteborg 1992
87. ANN AHLBERG *Att möta matematiska problem. En belysning av barns lärande.* Göteborg 1992
88. ELLA DANIELSON *Omvårdnad och dess psykosociala inslag. Sjuksköterskestuderandes uppfattningar av centrala termer och reaktioner inför en omvårdnadssituation.* Göteborg 1992
89. SHIRLEY BOOTH *Learning to program. A phenomenographic perspective.* Göteborg 1992
90. EVA BJÖRCK-ÅKESON *Samspel mellan små barn med rörelsebehinder och talhandikapp och deras föräldrar - en longitudinell studie.* Göteborg 1992
91. KARIN DAHLBERG *Helhetsyn i vården. En uppgift för sjuksköterskeutbildningen.* 1992
92. RIGMOR ERIKSSON *Teaching Language Learning. In-service training for communicative teaching and self directed learning in English as a foreign language.* 1993
93. KJELL HÄRENSTAM *Skolboks-islam. Analys av bilden av islam i läroböcker i religionskunskap.* Göteborg 1993.

94. INGRID PRAMLING *Kunskapens grunder. Prövning av en fenomenografisk ansats till att utveckla barns sätt att uppfatta sin omvärld.* Göteborg 1994.

95. MARIANNE HANSSON SCHERMAN *Att vågra vara sjuk. En longitudinell studie av förhållningssätt till astma/allergi.* Göteborg 1994

96. MIKAEL ALEXANDERSSON *Metod och medvetande.* Göteborg 1994

97. GUN UNENGE *Pappor i föräldrakooperativa daghem. En deskriptiv studie av pappors medverkan.* Göteborg 1994

98. BJÖRN SJÖSTRÖM *Assessing acute postoperative pain. Assessment strategies and quality in relation to clinical experience and professional role.* Göteborg 1995

99. MAJ ARVIDSSON *Lärares orsaks- och åtgärdstankar om elever med svårigheter.* Göteborg 1995

100. DENNIS BEACH *Making sense of the problems of change: An ethnographic study of a teacher education reform.* Göteborg 1995.

101. WOLMAR CHRISTENSSON *Subjektiv bedömning - som besluts och handlingsunderlag.* Göteborg 1995

102. SONJA KIHLMAN *Att vara förskollärover. Om yrkets pedagogiska innebörder.* Göteborg 1995

103. MARITTA LINDAHL *Inläring och erfarenhet. Ettäringars möte med förskolans värld.* Göteborg. 1996

104. GÖRAN FOLKESTAD *Computer Based Creative Music Making - Young Peoples' Music in the Digital Age.* Göteborg 1996

105. EVA EKEBLAD *Children • Learning • Numbers. A phenomenographic excursion into first-grade children's arithmetic.* Göteborg 1996

106. HELGE STRÖMDAHL *On mole and amount of substance. A study of the dynamics of concept formation and concept attainment.* Göteborg 1996

107. MARGARETA HAMMARSTRÖM *Varför inte högskola? En longitudinell studie av olika faktors betydelse för studiebegärade ungdomars utbildningskarriär.* Göteborg 1996

108. BJÖRN MÅRDÉN *Rektorers tänkande. En kritisk betraktelse av skolledarskap.* Göteborg 1996

109. GLORIA DALL'ALBA & BJÖRN HASSELGREN (EDS) *Reflections on Phenomenography - Toward a Methodology?* Göteborg 1996

110. ELISABETH HESSLEFORS ARKTOFT *I ord och handling. Innebörder av "att anknyta till elevers erfarenheter", uttryckta av lärare.* Göteborg 1996

111. BARBRO STRÖMBERG *Professionellt förhållningssätt hos läkare och sjuksköterskor. En studie av uppfattningar.* Göteborg 1997

112. HARRIET AXELSSON *Våga lära. Om lärare som förändrar sin miljöundervisning.* Göteborg 1997

113. ANN AHLBERG *Children's ways of handling and experiencing numbers*. Göteborg 1997
114. HUGO WIKSTRÖM *Att förstå förändring. Modellbyggande, simulering och gymnasieelevers lärande*. Göteborg 1997
115. DORIS AXELSEN *Listening to recorded music. Habits and motivation among high-school students*. Göteborg 1997.
116. EWA PILHAMMAR ANDERSSON *Handledning av sjuksköterskestuderande i klinisk praktik*. Göteborg 1997
117. OWE STRÅHLMAN *Elitidrott, karriär och avslutning*. Göteborg 1997
118. AINA TULLBERG *Teaching the 'mole'. A phenomenographic inquiry into the didactics of chemistry*. Göteborg 1997.
119. DENNIS BEACH *Symbolic Control and Power Relay Learning in Higher Professional Education*. Göteborg 1997
120. HANS-ÅKE SCHERP *Utmanande eller utmanat ledarskap. Rektor, organisationen och förändrat undervisningsmönster i gymnasieskolan*. Göteborg 1998
121. STAFFAN STUKÁT *Lärares planering under och efter utbildningen*. Göteborg 1998
122. BIRGIT LENDAHL ROSENDAHL *Examensarbetets innebörder. En studie av blivande lärares utsagor*. Göteborg 1998
123. ANN AHLBERG *Meeting Mathematics. Educational studies with young children*. Göteborg 1998
124. MONICA ROSÉN *Gender Differences in Patterns of Knowledge*. Göteborg 1998.
125. HANS BIRNIK *Lärare- elevrelationen. Ett relationistiskt perspektiv*. Göteborg 1998
126. MARGRETH HILL *Kompetent för "det nya arbetslivet"? Tre gymnasieklasser reflekterar över och diskuterar yrkesförberedande studier*. Göteborg 1998
127. LISBETH ÅBERG-BENGTSSON *Entering a Graphicate Society. Young Children Learning Graphs and Charts*. Göteborg 1998
128. MELVIN FEFER *The Conflict of Equals: A Constructionist View of Personality Development*. Göteborg 1999
129. ULLA RUNESSON *Variationens pedagogik. Skilda sätt att behandla ett matematiskt innehåll*. Göteborg 1999
130. SILWA CLAESSION *"Hur tänker du då?" Empiriska studier om relationen mellan forskning om elevuppfattningar och lärares undervisning*. Göteborg 1999
131. MONICA HANSEN *Yrkeskulturer i möte. Läraren, fritidspedagogen och samverkan*. Göteborg 1999
132. JAN THELIANDER *Att studera arbetets förändring under kapitalismen. Ure och Taylor i pedagogiskt perspektiv*. Göteborg 1999
133. TOMAS SAAR *Musikens dimensioner - en studie av unga musikers lärande*. Göteborg 1999
134. GLEN HELMSTAD *Understanding of understanding. An inquiry concerning experiential conditions for developmental learning*. Göteborg 1999
135. MARGARETA HOLMEGAARD *Språkmedvetenhet och ordinläring. Lärare och inlärare reflekterar kring en betydelsefälsövning i svenska som andraspråk*. Göteborg 1999
136. ALYSON MCGEE *Investigating Language Anxiety through Action Inquiry: Developing Good Research Practices*. Göteborg 1999
137. EVA GANNERUD *Genusperspektiv på lärargärning. Om kvinnliga klasslärares liv och arbete*. Göteborg 1999
138. TELLERVO KOPARE *Att rida stormen ut. Förlösningberättelser i Finnmark och Sápmi*. Göteborg 1999
139. MAJA SÖDERBÄCK *Encountering Parents. Professional Action Styles among Nurses in Pediatric Care*. Göteborg 1999
140. AIRI ROVIO - JOHANSSON *Being Good at Teaching. Exploring different ways of handling the same subject in Higher Education*. Göteborg 1999
141. EVA JOHANSSON *Etik i små barns värld. Om värden och normer bland de yngsta barnen i förskolan*. Göteborg 1999
142. KENNERT ORLENIUS *Förståelsens paradox. Yrkeserfarenhetens betydelse när förskollärare blir grundskollärare*. Göteborg 1999.
143. BJÖRN MÅRDÉN *De nya hälsomissionärerna – rörelser i korsvägen mellan pedagogik och hälsopromotion*. Göteborg 1999
144. MARGARETA CARLÉN *Kunskapslyft eller avbytarbänk? Möten med industriarbetare om utbildning för arbete*. Göteborg 1999
145. MARIA NYSTRÖM *Allvarligt psykiskt störda människors vardagliga tillvaro*. Göteborg 1999
146. ANN-KATRIN JAKOBSSON *Motivation och inläring ur genusperspektiv. En studie av gymnasieelever på teoretiska linjer/program*. Göteborg 1999
147. JOANNA GIOTA *Adolescents' perceptions of school and reasons for learning*. Göteborg 2000
148. BERIT CARLSTEDT *Cognitive abilities – aspects of structure, process and measurement*. Göteborg 2000
149. MONICA REICHENBERG *Röst och kausalitet i lärobokstexter. En studie av elevers förståelse av olika textversioner*. Göteborg 2000

150. HELENA ÅBERG *Sustainable waste management in households – from international policy to everyday practice. Experiences from two Swedish field studies.* Göteborg 2000
151. BJÖRN SJÖSTRÖM & BRITT JOHANSSON *Ambulanssjukvård. Ambulanssjukvårdarens och läkares perspektiv.* Göteborg 2000
152. AGNETA NILSSON *Omvårdnadskompetens inom hemsjukvård – en deskriptiv studie.* Göteborg 2001
153. ULLA LÖFSTEDT *Förskolan som lärandekontext för barns bildskapande.* Göteborg 2001
154. JÖRGEN DIMENÄS *Innehåll och interaktion. Om elevers lärande i naturvetenskaplig undervisning.* Göteborg 2001
155. BRITT MARIE APELGREN *Foreign Language Teachers' Voices. Personal Theories and Experiences of Change in Teaching English as a Foreign Language in Sweden.* Göteborg 2001
156. CHRISTINA CLIFFORDSON *Assessing empathy: Measurement characteristics and interviewer effects.* Göteborg 2001
157. INGER BERGGREN *Identitet, kön och klass. Hur arbetarflickor formar sin identitet.* Göteborg 2001
158. CARINA FURÅKER *Styrning och visioner – sjuksköterskeutbildning i förändring.* Göteborg 2001
159. INGER BERNDTSSON *Förskjutna horisonter. Livsförändring och lärande i samband med synsättnings eller blindhet.* Göteborg 2001
160. SONJA SHERIDAN *Pedagogical Quality in Preschool. An issue of perspectives.* Göteborg 2001
161. JAN BAHLENBERG *Den otroliga verkligheten sätter spår. Om Carlo Derkerts liv och konstpedagogiska gärning.* Göteborg 2001
162. FRANK BACH *Om ljuset i tillvaron. Ett undervisningsexperiment inom optik.* Göteborg 2001
163. PIA WILLIAMS *Barn lär av varandra. Samlärande i förskola och skola.* Göteborg 2001
164. VIGDIS GRANUM *Studentenes forestillinger om sykepleie som fag og funksjon.* Göteborg 2001
165. MARIT ALVESTAD *Den komplekse planlegginga. Førskolelærarar om pedagogiske planlegging og praksis.* Göteborg 2001
166. GIRMA BERHANU *Learning-In-Context. An Ethnographic Investigation of Mediated Learning Experiences among Ethiopian Jews in Israel.* Göteborg 2001.
167. OLLE ESKILSSON *En longitudinell studie av 10 – 12-åringars förståelse av materiens förändringar.* Göteborg 2001
168. JONAS EMANUELSSON *En fråga om frågor. Hur lärares frågor i klassrummet gör det möjligt att få reda på elevernas sätt att förstå det som undervisningen behandlar i matematik och naturvetenskap.* Göteborg 2001
169. BIRGITTA GEDDA *Den offentliga bemyndigheten. En studie om sjuksköterskans pedagogiska funktion och kompetens i folkhälsoarbetet.* Göteborg 2001
170. FEBE FRIBERG *Pedagogiska möten mellan patienter och sjuksköterskor på en medicinsk vårdavdelning. Mot en värddidaktik på livsvärldsgrunn.* Göteborg 2001
171. MADELEINE BERGH *Medvetenhet om bemötande. En studie om sjuksköterskans pedagogiska funktion och kompetens i närståendeundervisning.* Göteborg 2002
172. HENRIK ERIKSSON *Den diplomatiska punkten – maskulinitet som kroppsligt identitetsskapande projekt i svensk sjuksköterskeutbildning.* Göteborg 2002
173. SOLVEIG LUNDGREN *I spåren av en bemanningsförändring. En studie av sjuksköterskors arbete på en kirurgisk vårdavdelning.* Göteborg 2002
174. BIRGITTA DAVIDSSON *Mellan soffan och katedern. En studie av hur förskollärare och grundskollärare utvecklar pedagogisk integration mellan förskola och skola.* Göteborg 2002
175. KARI SØNDENÅ *Tradisjon og Transcendens – ein fenomenologisk studie av refleksjon i norsk førskulelærarutdanning.* Göteborg 2002
176. CHRISTINE BENTLEY *The Roots of Variation of English-Teaching. A Phenomenographic Study Founded on an Alternative Basic Assumption.* Göteborg 2002
177. ÅSA MÄKITALO *Categorizing Work: Knowing, Arguing, and Social Dilemmas in Vocational Guidance.* Göteborg 2002
178. MARITA LINDAHL *VÅRDA – VÄGLEDA – LÄRA. Effekstudie av ett interventionsprogram för pedagogers lärande i förskolemiljön.* Göteborg 2002
179. CHRISTINA BERG *Influences on schoolchildren's dietary selection. Focus on fat and fibre at breakfast.* Göteborg 2002
180. MARGARETA ASP *Vila och lärande om vila. En studie på livsvärldsfenomenologisk grund.* Göteborg 2002
181. FERENC MARTON & PAUL MORRIS (EDS) *What matters? Discovering critical conditions of classroom learning.* Göteborg 2002
182. ROLAND SEVERIN *Dom vet vad dom talar om. En intervjustudie om elevers uppfattningar av begreppen makt och samhällsförändring.* Göteborg 2002
- Editors: Björn Andersson, Jan Holmer and Ingrid Pramling Samuelsson
183. MARLÉNE JOHANSSON *Slöjdpraktik i skolan – hand, tanke, kommunikation och andra medierande redskap.* Göteborg 2002

184. INGRID SANDEROTH *Om lust att lära i skolan: En analys av dokument och klass 8y*. Göteborg 2002
185. INGA-LILL JAKOBSSON *Diagnos i skolan. En studie av skolsituationer för elever med syndromdiagnos*. Göteborg 2002
186. EVA-CARIN LINDGREN *Empowering Young Female Athletes – A Possible Challenge to the Male Hegemony in Sport. A Descriptive and Interventional Study*. Göteborg 2002
187. HANS RYSTEDT *Bridging practices. Simulations in education for the health-care professions*. Göteborg 2002
188. MARGARETA EKBORG *Naturvetenskaplig utbildning för hållbar utveckling? En longitudinell studie av hur studenter på grunskolläraprogrammet utvecklar för miljöundervisning relevanta kunskaper i naturkunskap*. Göteborg 2002
189. ANETTE SANDBERG *Vuxnas levärld. En studie om vuxnas erfarenheter av lek*. Göteborg 2002
190. GUNLÖG BREDÄNGE *Gränslös pedagog. Fyra studier om utländska lärare i svensk skola*. Göteborg 2003
191. PER-OLOF BENTLEY *Mathematics Teachers and Their Teaching. A Survey Study*. Göteborg 2003
192. KERSTIN NILSSON *MANDAT – MAKT – MANAGEMENT. En studie av hur värdenschefer ledarskap konstrueras*. Göteborg 2003
193. YANG YANG *Measuring Socioeconomic Status and its Effects at Individual and Collective Levels: A Cross-Country Comparison*. Göteborg 2003
194. KNUT VOLDEN *Mediekunskap som mediekritikk*. Göteborg 2003.
195. LOTTA LAGER-NYQVIST *Att göra det man kan – en longitudinell studie av hur sju lärarstudenter utvecklar sin undervisning och formar sin lärarroll i naturvetenskap*. Göteborg 2003
196. BRITT LINDAHL *Lust att lära naturvetenskap och teknik? En longitudinell studie om vägen till gymnasiet*. Göteborg 2003
197. ANN ZETTERQVIST *Ämnesdidaktisk kompetens i evolutionsbiologi. En intervjuundersökning med nio biologilärare*. Göteborg 2003
198. ELSIE ANDERBERG *Språkavvändningens funktion vid utveckling av kunskap om objekt*. Göteborg 2003.
199. JAN GUSTAFSSON *Integration som text, diskursiv och social praktik. En policyetnografisk fallstudie av mötet mellan skolan och förskoleklassen*. Göteborg 2003.
200. EVELYN HERMANSSON *Akademisering och professionalisering – barnmorskans utbildning i förändring*. Göteborg 2003
201. KERSTIN VON BRÖMSEN *Tolkningar, förhandlingar och tystnader. Elevers tal om religion i det mångkulturella och postkoloniala rummet*. Göteborg 2003
202. MARIANNE LINDBLAD FRIDH *Från allmänsjuksköterska till specialistsjuksköterska inom intensivvård. En studie av erfarenheter från specialistutbildningen och från den första yrkesverksamma tiden inom intensivvården*. Göteborg 2003
203. BARBRO CARLI *The Making and Breaking of a Female Culture: The History of Swedish Physical Education 'in a Different Voice'*. Göteborg 2003
204. ELISABETH DAHLBORG-LYCKHAGE *"Systers" konstruktion och mumifiering – i TV-serier och i studenters föreställningar*. Göteborg 2003
205. ULLA HELLSTRÖM MUHLI *Att överbygga perspektiv. En studie av behovsbedömningsamtal inom äldreinriktat socialt arbete*. Göteborg 2003
206. KRISTINA AHLBERG *Synvärdor. Universitetsstudenters berättelser om kvalitativa förändringar av sätt att erfara situationers mening under utbildningspraktik*. Göteborg 2004
207. JONAS IVARSSON *Renderings & Reasoning: Studying artifacts in human knowing*. Göteborg 2004
208. MADELEINE LÖWING *Matematikundervisningens konkreta gestaltning. En studie av kommunikationen lärare – elev och matematiklektionens didaktiska ramar*. Göteborg 2004
209. PIJA EKSTRÖM *Makten att definiera. En studie av hur beslutsfattare formulerar villkor för specialpedagogisk verksamhet*. Göteborg 2004
210. CARIN ROOS *Skriftspråkande döva barn. En studie om skriftspråkligt lärande i förskola och skola*. Göteborg 2004
211. JONAS LINDEROTH *Datorspelandets mening. Bortom idén om den interaktiva illusionen*. Göteborg 2004
212. ANITA WALLIN *Evolutionsteorin i klassrummet. På väg mot en ämnesdidaktisk teori för undervisning i biologisk evolution*. Göteborg 2004
213. EVA HJÖRNE *Excluding for inclusion? Negotiating school careers and identities in pupil welfare settings in the Swedish school*. Göteborg 2004
214. MARIE BLIDING *Inneslutandets och uteslutandets praktik. En studie av barns relationsarbete i skolan*. Göteborg 2004
215. LARS-ERIK JONSSON *Appropriating Technologies in Educational Practices. Studies in the Contexts of Compulsory Education, Higher Education, and Fighter Pilot Training*. Göteborg 2004
216. MIA KARLSSON *An ITiS Teacher Team as a Community of Practice*. Göteborg 2004
217. SILWA CLAESSION *Lärares levda kunskap*. Göteborg 2004
218. GUN-BRITT WÄRVIK *Ambitioner att förändra och artefaktens verkan. Gränsskapande och stabiliserande praktiker på produktionsgolvet*. Göteborg 2004

219. KARIN LUMSDEN WASS *Vuxenutbildning i omvandling. Kunskapslyftet som ett sätt att organisera förnyelse.* Göteborg 2004
220. LENA DAHL *Amningspraktikens villkor. En intervjustudie av en grupp kvinnors föreställningar på och erfarenheter av amning.* Göteborg 2004
221. ULRIC BJÖRCK *Distributed Problem-Based Learning. Studies of a Pedagogical Model in Practice.* Göteborg 2004
222. ANNEKA KNUTSSON "To the best of your knowledge and for the good of your neighbour". *A study of traditional birth attendants in Addis Ababa, Ethiopia.* Göteborg 2004
223. MARIANNE DOVEMARK *Ansvar – flexibilitet – valfrihet. En etnografisk studie om en skola i förändring.* Göteborg 2004
224. BJÖRN HAGLUND *Traditioner i möte. En kvalitativ studie av fritidspedagogers arbete med samlingar i skolan.* Göteborg 2004
225. ANN-CHARLOTTE MÅRDSJÖ *Lärandets skiftande innebörder – uttryckta av förskollärare i vidareutbildning.* Göteborg 2005
226. INGRID GRUNDÉN *Att återerövra kroppen. En studie av livet efter en ryggmärgsskada.* Göteborg 2005
227. KARIN GUSTAFSSON & ELISABETH MELLGREN *Barns skriftspråkande – att bli en skrivande och läsande person.* Göteborg 2005
228. GUNNAR NILSSON *Att äga π. Praxisnära studier av lärarstudenters arbete med geometrilaborationer.* Göteborg 2005.
229. BENGT LINDGREN *Bild, visualitet och vetande. Diskussion om bild som ett kunskapsfält inom utbildning.* Göteborg 2005
230. PETRA ANGERVALL *Jämställdhetsarbetets pedagogik. Dilemman och paradoxer i arbetet med jämställdhet på ett företag och ett universitet.* Göteborg 2005
231. LENNART MAGNUSSON *Designing a responsive support service for family carers of frail older people using ICT.* Göteborg 2005
232. MONICA REICHENBERG *Gymnasieelever samtalar kring jacketexter. En studie av textsamtal med goda och svaga läsare.* Göteborg 2005
233. ULRICA WOLFF *Characteristics and varieties of poor readers.* Göteborg 2005
234. CECILIA NIELSEN *Mellan fakticitet och projekt. Läs- och skrivsvårigheter och strävan att övervinna dem.* Göteborg 2005.
235. BERTH HEDBERG *Decision Making and Communication in Nursing Practice. Aspects of Nursing Competence.* Göteborg 2005
236. MONICA ROSÉN, EVA MYRBERG & JAN-ERIC GUSTAFSSON *Läskompetens i skolår 3 och 4. Nationell rapport från PIRLS 2001 i Sverige. The IEA Progress in International Reading Literacy Study.* Göteborg 2005
237. INGRID HENNING LOEB *Utveckling och förändring i kommunal vuxenutbildning. En yrkeshistorisk ingång med berättelser om lärarbanor.* Göteborg 2006.
238. NIKLAS PRAMLING *Minding metaphors: Using figurative language in learning to represent.* Göteborg 2006
239. KONSTANTIN KOUGIOUMTZIS *Lärarkulturer och professionskoder. En komparativ studie av idrottslärare i Sverige och Grekland.* Göteborg 2006
240. STEN BÄTH *Kvalifikation och medborgarfostran. En analys av reformtexter avseende gymnasieskolans sabbalsupdrag.* Göteborg 2006.
241. EVA MYRBERG *Fristående skolor i Sverige – Effekter på 9-10-åriga elevers läsförståelse.* Göteborg 2006
242. MARY-ANNE HOLFVE-SABEL *Attitudes towards Swedish comprehensive school. Comparisons over time and between classrooms in grade 6.* Göteborg 2006
243. CAROLINE BERGGREN *Entering Higher Education – Gender and Class Perspectives.* Göteborg 2006
244. CRISTINA THORNELL & CARL OLIVESTAM *Kulturmöte i centralafrikansk kontext med kyrkan som arena.* Göteborg 2006
245. ARVID TREEKREM *Att leda som man lär. En arbetsmiljöpedagogisk studie av toppledares ideologier om ledarskapets taktiska potentialer.* Göteborg 2006
246. EVA GANNERUD & KARIN RÖNNERMAN *Innehåll och innebörd i lärares arbete i förskola och skola – en fallstudie ur ett genusperspektiv.* Göteborg 2006
247. JOHANNES LUNNEBLAD *Förskolan och mångfalden – en etnografisk studie på en förskola i ett multietniskt område.* Göteborg 2006
248. LISA ASP-ONSJÖ *Åtgärdsprogram – dokument eller verktyg? En fallstudie i en kommun.* Göteborg 2006
249. EVA JOHANSSON & INGRID PRAMLING SAMUELSSON *Lek och läroplan. Möten mellan barn och lärare i förskola och skola.* Göteborg 2006
250. INGER BJÖRNELOO *Innebörder av hållbar utveckling. En studie av lärares utsagor om undervisning.* Göteborg 2006
251. EVA JOHANSSON *Etiska överenskommelser i förskolebarns världar.* Göteborg 2006
252. MONICA PETERSSON *Att genuszappa på säker eller osäker mark. Hem- och konsumentkunskap ur ett könsperspektiv.* Göteborg 2007
253. INGELA OLSSON *Handlingskompetens eller inlärd hjälplöshet? Lärandeprocesser hos verkstadsindustriarbetare.* Göteborg 2007

254. HELENA PEDERSEN *The School and the Animal Other. An Ethnography of human-animal relations in education.* Göteborg 2007

255. ELIN ERIKSEN ØDEGAARD *Meningsskaping i barnehagen. Innhold og bruk av barns og voksnes samtalefortellinger.* Göteborg 2007

256. ANNA KLERFELT *Barns multimediala berättande. En länk mellan mediakultur och pedagogisk praktik.* Göteborg 2007

257. PETER ERLANDSSON *Docile bodies and imaginary minds: on Schön's reflection-in-action.* Göteborg 2007

258. SONJA SHERIDAN OCH PIA WILLIAMS *Dimensioner av konstruktiv konkurrens. Konstruktiva konkurrensformer i förskola, skola och gymnasium.* Göteborg 2007

259. INGELA ANDREASSON *Elevplanen som text - om identitet, genus, makt och styrning i skolans elevdokumentation.* Göteborg 2007

Editors: Jan-Eric Gustafsson, Annika Härenstam and Ingrid Pramling Samuelsson

260. ANN-SOFIE HOLM *Relationer i skolan. En studie av feminiteter och maskuliniteter i år 9.* Göteborg 2008

261. LARS-ERIK NILSSON *But can't you see they are lying: Student moral positions and ethical practices in the wake of technological change.* Göteborg 2008

262. JOHAN HÄGGSTRÖM *Teaching systems of linear equations in Sweden and China: What is made possible to learn?* Göteborg 2008

263. GUNILLA GRANATH *Milda makter! Utvecklingsamtal och loggböcker som disciplinerings tekniker.* Göteborg 2008

264. KARIN GRAHN *Flickor och pojkar i idrottens läromedel. Konstruktioner av genus i ungdomsträna utbildningen.* Göteborg 2008.

265. PER-OLOF BENTLEY *Mathematics Teachers and Their Conceptual Models. A New Field of Research.* Göteborg 2008

266. SUSANNE GUSTAVSSON *Motstånd och mening. Imnebörd i blivande lärares seminariesamtal.* Göteborg 2008

267. ANITA MATTSSON *Flexibel utbildning i praktiken. En fallstudie av pedagogiska processer i en distansutbildning med en öppen design för samarbetslärande.* Göteborg 2008

268. ANETTE EMILSON *Det önskvärda barnet. Fostran uttryckt i vardagliga kommunikationshandlingar mellan lärare och barn i förskolan.* Göteborg 2008

269. ALLI KLAPP LEKHOLM *Grades and grade assignment: effects of student and school characteristics.* Göteborg 2008

270. ELISABETH BJÖRKLUND *Att erövra litteracitet. Små barns kommunikativa möten med berättande, bilder, text och tecken i förskolan.* Göteborg 2008

271. EVA NYBERG *Om livets kontinuitet. Undervisning och lärande om växters och djurs livscykel - en fallstudie i årskurs 5.* Göteborg 2008

272. CANCELLED

273. ANITA NORLUND *Kritisk sakprosläsning i gymnasieskolan. Didaktiska perspektiv på läroböcker, lärare och nationella prov.* Göteborg 2009

274. AGNETA SIMEONSDOTTER SVENSSON *Den pedagogiska samlings i förskoleklassen. Barns olika sätt att erfara och hantera svårigheter.* Göteborg 2009

275. ANITA ERIKSSON *Om teori och praktik i lärarutbildningen. En etnografisk och diskursanalytisk studie.* Göteborg 2009

276. MARIA HJALMARSSON *Lärarprofessionens genusordning. En studie av lärares uppfattningar om arbetsuppgifter, kompetens och förväntningar.* Göteborg 2009.

277. ANNE DRAGEMARK OSCARSON *Self-Assessment of Writing in Learning English as a Foreign Language. A Study at the Upper Secondary School Level.* Göteborg 2009

278. ANNIKA LANTZ-ANDERSSON *Framing in Educational Practices. Learning Activity, Digital Technology and the Logic of Situated Action.* Göteborg 2009

279. RAUNI KARLSSON *Demokratiska värden i förskolebarns vardag.* Göteborg 2009

280. ELISABETH FRANK *Läsförmågan bland 9-10-åringar. Betydelsen av skolklimat, hem- och skolsamverkan, lärarkompetens och elevers hembakgrund.* Göteborg 2009

281. MONICA JOHANSSON *Anpassning och motstånd. En etnografisk studie av gymnasieelevers institutionella identitetsskapande.* Göteborg 2009

282. MONA NILSEN *Food for Thought. Communication and the transformation of work experience in web-based in-service training.* Göteborg 2009

283. INGA WERNERSSON (RED) *Genus i förskola och skola. Förändringar i policy, perspektiv och praktik.* Göteborg 2009

284. SONJA SHERIDAN, INGRID PRAMLING SAMUELSSON & EVA JOHANSSON (RED) *Barns tidiga lärande. En tvärsnittstudie om förskolan som miljö för barns lärande.* Göteborg 2009

285. MARIE HJALMARSSON *Loyalitet och motstånd - anställdas agerande i ett föränderligt hemtjänstarbete.* Göteborg 2009.

286. ANETTE OLIN *Skolans mötespraktik - en studie om skolutveckling genom yrkesverksammas förståelse*. Göteborg 2009

287. MIRELLA FORSBERG AHLCRONA *Handdockans kommunikativa potential som medierande redskap i förskolan*. Göteborg 2009

288. CLAS OLANDER *Towards an interlanguage of biological evolution: Exploring students' talk and writing as an arena for sense-making*. Göteborg 2010

Editors: Jan-Eric Gustafsson, Åke Ingerman and Ingrid Pramling Samuelsson

289. PETER HASSELSKOG *Slöjdlärares förhållningsätt i undervisningen*. Göteborg 2010

290. HILLEVI PRELL *Promoting dietary change. Intervening in school and recognizing health messages in commercials*. Göteborg 2010

291. DAVOUD MASOUMI *Quality Within E-learning in a Cultural Context. The case of Iran*. Göteborg 2010

292. YLVA ODENBRING *Kramar, kategoriseringar och hjälpfröknar. Könskonstruktioner i interaktion i förskola, förskoleklass och skolor ett*. Göteborg 2010

293. ANGELIKA KULLBERG *What is taught and what is learned. Professional insights gained and shared by teachers of mathematics*. Göteborg 2010

294. TORGEIR ALVESTAD *Barnebagens relationelle verden - små barn som kompetente aktörer i produktive forhandlinger*. Göteborg 2010

295. SYLVI VIGMO *New spaces for Language Learning. A study of student interaction in media production in English*. Göteborg 2010

296. CAROLINE RUNESDOTTER *I otakt med tiden? Folkhögskolorna i ett föränderligt fält*. Göteborg 2010

297. BIRGITTA KULLBERG *En etnografisk studie i en thailändsk grundskola på en ö i södra Thailand. I sökandet efter en framtid då nnet har nog av sitt*. Göteborg 2010

298. GUSTAV LYMER *The work of critique in architectural education*. Göteborg 2010

299. ANETTE HELLMAN *Kan Batman vara rosa? Förhandlingar om pojkighet och normalitet på en förskola*. Göteborg 2010

300. ANNIKA BERGVIKEN-RENSFELDT *Opening higher education. Discursive transformations of distance and higher education government*. Göteborg 2010

301. GETAHUN YACOB ABRAHAM *Education for Democracy? Life Orientation: Lessons on Leadership Qualities and Voting in South African Comprehensive Schools*. Göteborg 2010

302. LENA SJÖBERG *Bäst i klassen? Lärare och elever i svenska och europeiska policytexter*. Göteborg 2011

303. ANNA POST *Nordic stakeholders and sustainable catering*. Göteborg 2011

304. CECILIA KILHAMN *Making Sense of Negative Numbers*. Göteborg 2011

305. ALLAN SVENSSON (RED) *Utvärdering Genom Uppföljning. Longitudinell individforskning under ett halvsekel*. Göteborg 2011

306. NADJA CARLSSON *I kamp med skriftspråket. Vuxenstuderande med läs- och skrivsvårigheter i ett livsvärldsperspektiv*. Göteborg 2011

307. AUD TORILL MELAND *Ansvar for egen læring. Intensjoner og realiteter ved en norsk videregående skole*. Göteborg 2011

308. EVA NYBERG *Folkebildung för demokrati. Colombianska kvinnors perspektiv på kunskap som förändringskraft*. Göteborg 2011

309. SUSANNE THULIN *Lärares tal och barns nyfikenhet. Kommunikation om naturvetenskapliga innehåll i förskolan*. Göteborg 2011

310. LENA FRIDLUND *Interkulturell undervisning – ett pedagogiskt dilemma. Talet om undervisning i svenska som andraspråk och i förberedelseklass*. Göteborg 2011

311. TARJA ALATALO *Skicklig läs- och skrivundervisning i åk 1-3. Om lärares möjligheter och hinder*. Göteborg 2011

312. LISE-LOTTE BJERVÅS *Samtal om barn och pedagogisk dokumentation som bedömningspraktik i förskolan. En diskursanalys*. Göteborg 2011

313. ÅSE HANSSON *Ansvar for matematiklärande. Effekter av undervisningsansvar i det flerspråkiga klassrummet*. Göteborg 2011

314. MARIA REIS *Att ordna, från ordning till ordning. Yngre förskolebarns matematiserande*. Göteborg 2011

315. BENIAMIN KNUTSSON *Curriculum in the Era of Global Development – Historical Legacies and Contemporary Approaches*. Göteborg 2011

316. EVA WEST *Undervisning och lärande i naturvetenskap. Elevers lärande i relation till en forskningsbaserad undervisning om ljud, hörsel och hälsa*. Göteborg 2011

317. SIGNILD RISENFORS *Gymnasieungdomars livstolkande*. Göteborg 2011

318. EVA JOHANSSON & DONNA BERTHELSEN (Ed.) *Spaces for Solidarity and Individualism in Educational Contexts*. Göteborg 2012

319. ALASTAIR HENRY *L3 Motivation*. Göteborg 2012

320. ANN PARINDER *Ungdomars matval – erfarenheter, visioner och miljöargument i eget husbäll*. Göteborg 2012

321. ANNE KULTTI *Flerspråkiga barn i förskolan: Villkor för deltagande och lärande*. Göteborg 2012

322. BO-LENNART EKSTRÖM *Kontroversen om DAMP. En kontroversstudie av vetenskapligt gränsarbete och översättning mellan olika kunskapsparadigm.* Göteborg 2012
323. MUN LING LO *Variation Theory and the Improvement of Teaching and Learning.* Göteborg 2012
324. ULLA ANDRÉN *Self-awareness and self-knowledge in professions. Something we are or a skill we learn.* Göteborg 2012
325. KERSTIN SIGNERT *Variation and invariants i Maria Montessoris sinnestränande materiel.* Göteborg 2012
326. INGEMAR GERRBO *Idén om en skola för alla och specialpedagogisk organisering i praktiken.* Göteborg 2012
327. PATRIK LILJA *Contextualizing inquiry. Negotiations of tasks, tools and actions in an upper secondary classroom.* Göteborg 2012
328. STEFAN JOHANSSON *On the Validity of Reading Assessments: Relationships Between Teacher Judgments, External Tests and Pupil Self-assessments.* Göteborg 2013
329. STEFAN PETTERSSON *Nutrition in Olympic Combat Sports. Elite athletes' dietary intake, hydration status and experiences of weight regulation.* Göteborg 2013
330. LINDA BRADLEY *Language learning and technology – student activities in web-based environments.* Göteborg 2013
331. KALLE JONASSON *Sport Has Never Been Modern.* Göteborg 2013
332. MONICA HARALDSSON STRÄNG *Yngre elevers lärande om natur. En studie av kommunikation om modeller i institutionella kontexter.* Göteborg 2013
333. ANN VALENTIN KVIST *Immigrant Groups and Cognitive Tests – Validity Issues in Relation to Vocational Training.* Göteborg 2013
334. ULRICA BENNERSTEDT *Knowledge at play. Studies of games as members' matters.* Göteborg 2013
335. EVA ÄRLEMALM-HAGSÉR *Engagerade i världens bästa? Lärande för hållbarhet i förskolan.* Göteborg 2013
336. ANNA-KARIN WYNDHAMN *Tänka fritt, tänka rätt. En studie om värdeöverföring och kritiskt tänkande i gymnasieskolans undervisning.* Göteborg 2013
337. LENA TYRÉN *"Vi får ju inte riktigt förutsättningarna för att genomföra det som vi vill." En studie om lärarens möjligheter och hinder till förändring och förbättring i praktiken.* Göteborg 2013
338. ANNIKA LILJA *Förtroendefulla relationer mellan lärare och elev.* Göteborg 2013
339. MAGNUS LEVINSSON *Evidens och existens. Evidensbaserad undervisning i ljuset av lärares erfarenheter.* Göteborg 2013
340. ANNELI SCHWARTZ *Pedagogik, plats och prestationer. En etnografisk studie om en skola i förorten.* Göteborg 2013
341. ELISABET ÖHRN och LISBETH LUNDAHL (red) *Kön och karriär i akademien. En studie inom det utbildningsvetenskapliga fältet.* Göteborg 2013
342. RICHARD BALDWIN *Changing practice by reform. The recontextualisation of the Bologna process in teacher education.* Göteborg 2013
343. AGNETA JONSSON *Att skapa läroplan för de yngsta barnen i förskolan. Barns perspektiv och nuets didaktik.* Göteborg 2013
344. MARIA MAGNUSSON *Skylta med kunskap. En studie av hur barn urskiljer grafiska symboler i hem och förskola.* Göteborg 2013
345. ANNA-LENA LILLIESTAM *Aktör och struktur i historieundervisning. Om utveckling av elevers historiska resonering.* Göteborg 2013
346. KRISTOFFER LARSSON *Kritiskt tänkande i grundskolans samhällskunskap. En fenomenografisk studie om manifesterat kritiskt tänkande i samhällskunskap hos elever i årskurs 9.* Göteborg 2013
347. INGA WERNERSSON och INGEMAR GERRBO (red) *Differentieringens janusansikte. En antologi från Institutionen för pedagogik och specialpedagogik vid Göteborgs universitet.* Göteborg 2013
348. LILL LANGELOTZ *Vad gör en skicklig lärare? En studie om kollegial handledning som utvecklingspraktik.* Göteborg 2014
349. STEINGERDUR OLAFSDOTTIR *Television and food in the lives of young children.* Göteborg 2014
350. ANNA-CARIN RAMSTEN *Kunskaper som byggde folkhemmet. En fallstudie av förutsättningar för lärande vid teknikerskiften inom processindustrin.* Göteborg 2014
351. ANNA-CARIN BREDMAR *Lärares arbetsglädje. Betydelsen av emotionell närvaro i det pedagogiska arbetet.* Göteborg 2014
352. ZAHRA BAYATI *"den Andre" i lärarutbildningen. En studie om den rasifierade svenska studentens villkor i globaliseringsens tid.* Göteborg 2014
353. ANDERS EKLÖF *Project work, independence and critical thinking.* Göteborg 2014
354. EVA WENNÅS BRANTE *Möte med multimodalt material. Vilken roll spelar dyslexi för uppfattandet av text och bild?* Göteborg 2014
355. MAGNUS FERRY *Idrottsprofilerad utbildning – i spåren av en avreglerad skola.* Göteborg 2014

Editors: Jan-Eric Gustafsson, Åke Ingerman and Pia Williams

356 CECILIA THORSEN *Dimensionality and Predictive validity of school grades: The relative influence of cognitive and social-behavioral aspects.* Göteborg 2014

357 ANN-MARIE ERIKSSON *Formulating knowledge. Engaging with issues of sustainable development through academic writing in engineering education.* Göteborg 2014

358 PÅR RYLANDER *Tränarens makt över spelare i lagidrotter: Sett ur French och Ravens maktbasteori.* Göteborg 2014

359 PERNILLA ANDERSSON VARGA *Skrivundervisning i gymnasieskolan. Svenskämnets roll i den sociala reproduktionen.* Göteborg 2014

360 GUNNAR HYLTEGREN *Vaghet och vanmakt - 20 år med kunskapskrav i den svenska skolan.* Göteborg 2014

361 MARIE HEDBERG *Idrotten sätter agendan. En studie av Riksidrottsgymnasietränares handlande utifrån sitt dubbla uppdrag.* Göteborg 2014

362 KARI-ANNE JØRGENSEN *What is going on out there? - What does it mean for children's experiences when the kindergarten is moving their everyday activities into the nature - landscapes and its places?* Göteborg 2014

363 ELISABET ÖHRN och ANN-SOFIE HOLM (red) *Att lyckas i skolan. Om skolprestationer och kön i olika undervisningspraktiker.* Göteborg 2014

364 ILONA RINNE *Pedagogisk takt i betygssamtal. En fenomenologisk hermeneutisk studie av gymnasielärares och elevers förståelse av betyg.* Göteborg 2014

365 MIRANDA ROCKSÉN *Reasoning in a Science Classroom.* Göteborg 2015

366 ANN-CHARLOTTE BIVALL *Helpdeskning: Knowing and learning in IT support practices.* Göteborg 2015

367 BIRGITTA BERNE *Naturvetenskap möter etik. En klassrumsstudie av elevers diskussioner om samhällsfrågor relaterade till bioteknik.* Göteborg 2015

368 AIRI BIGSTEN *Fostran i förskolan.* Göteborg 2015

369 MARITA CRONQVIST *Yrkesetik i lärarutbildning - en balanskonst.* Göteborg 2015

370 MARITA LUNDSTRÖM *Förskolebarns strävanden att kommunicera matematik.* Göteborg 2015

371 KRISTINA LANÅ *Makt, kön och diskurser. En etnografisk studie om elevers aktörsskap och positioneringar i undervisningen.* Göteborg 2015

372 MONICA NYVALLER *Pedagogisk utveckling genom kollegial granskning: Fallet Lärande Besök utifrån aktör-nätverksteori.* Göteborg 2015

373 GLENN ØVREVIK KJERLAND *Å lære å undervise i kroppsøving. Design for utvikling av teoribasert undervisning og kritisk refleksjon i kroppsøvingslærerutdanningen.* Göteborg 2015

374 CATARINA ECONOMOU *"I svenska två vågar jag prata mer och så". En didaktisk studie om skolämnet svenska som andraspråk.* Göteborg 2015

375 ANDREAS OTTEMO *Kön, kropp, begär och teknik: Passion og instrumentalitet på två tekniska høyskoleprogram.* Göteborg 2015

376 SHRUTI TANEJA JOHANSSON *Autism-in-context. An investigation of schooling of children with a diagnosis of autism in urban India.* Göteborg 2015

377 JAANA NEHEZ *Rektorers praktiker i möte med utvecklingsarbete. Möjligheter och hinder för planerad förändring.* Göteborg 2015

378 OSA LUNDBERG *Mind the Gap – Ethnography about cultural reproduction of difference and disadvantage in urban education.* Göteborg 2015

379 KARIN LAGER *I spänningsfältet mellan kontroll och utveckling. En polycystudie av systematiskt kvalitetsarbete i kommunen, förskolan och fritidshemmet.* Göteborg 2015

380 MIKAELA ÅBERG *Doing Project Work. The Interactional Organization of Tasks, Resources, and Instructions.* Göteborg 2015

381 ANN-LOUISE LJUNGBLAD *Takt och hållning - en relationell studie om det oberäkneliga i matematikundervisningen.* Göteborg 2016

382 LINN HÅMAN *Extrem jakt på hälsa. En explorativ studie om ortorexia nervosa.* Göteborg 2016

383 EVA OLSSON *On the impact of extramural English and CLIL on productive vocabulary.* Göteborg 2016

384 JENNIE SIVENBRING *I den betraktades ögon. Ungdomar om bedömning i skolan.* Göteborg 2016

385 PERNILLA LAGERLÖF *Musical play. Children interacting with and around music technology.* Göteborg 2016

386 SUSANNE MECKBACH *Mästarcoacherna. Att bli, vara och utvecklas som tränare inom svensk elitfotboll.* Göteborg 2016

387 LISBETH GYLLANDER TORKILDSSEN *Bedömning som gemensam angelägenhet – enkelt i retoriken, svårare i praktiken. Elevers och lärares förståelse och erfarenheter.* Göteborg 2016

388 cancelled

389 PERNILLA HEDSTRÖM *Hälsocoach i skolan. En utvärderande fallstudie av en hälsofrämjande intervention.* Göteborg 2016

Editors: Åke Ingerman, Pia Williams and
Elisabet Öhrn

- 390 JONNA LARSSON *När fysik blir lärområde i förskolan*. Göteborg 2016
- 391 EVA M JOHANSSON *Det motsägelsefulla bedömningsuppdraget. En etnografisk studie om bedömning i förskolekontext*. Göteborg 2016
- 392 MADELEINE LÖWING *Diamant – diagnoser i matematik. Ett kartläggningsmaterial baserat på didaktisk ämnesanalys*. Göteborg 2016
- 393 JAN BLOMGREN *Den svärfångade motivationen: elever i en digitaliserad lärmiljö*. Göteborg 2016
- 394 DAVID CARLSSON *Vad är religionslärares kunskap? En diskursanalys av preparatssamtal i lärarutbildningen*. Göteborg 2017
- 395 EMMA EDSTRAND *Learning to reason in environmental education: Digital tools, access points to knowledge and science literacy*. Göteborg 2017
- 396 KATHARINA DAHLBÄCK *Svenskämnets estetiska dimensioner - - i klassrum, kursplaner och lärares uppfattningar*. Göteborg 2017
- 397 K GABRIELLA THORELL *Framåt marsch! – Ridlärarrollen från dåtid till samtid med perspektiv på framtid*. Göteborg 2017
- 398 RIMMA NYMAN *Interest and Engagement: Perspectives on Mathematics in the Classroom*. Göteborg 2017
- 399 ANNIKA HELLMAN *Visnella möjlighetsrum. Gymnasieelevers subjektsskapande i bild och medieundervisning*. Göteborg 2017
- 400 OLA STRANDLER *Performativa lärarpraktiker*. Göteborg 2017
- 401 AIMEE HALEY *Geographical Mobility of the Tertiary Educated – Perspectives from Education and Social Space*. Göteborg 2017
- 402 MALIN SVENSSON *Hoppet om en framtidsplats. Asylsökande barn i den svenska skolan*. Göteborg 2017
- 403 CATARINA ANDISHMAND *Fritidsbem eller servicebem? En etnografisk studie av fritidsbem i tre socioekonomiskt skilda områden*. Göteborg 2017
- 404 MONICA VIKNER STAFBERG *Om läraryrket. En livsvärldsfenomenologisk studie av bildningsgångar in i läraryrket*. Göteborg 2017
- 405 ANGELICA SIMONSSON *Sexualitet i klassrummet. Språkundervisning, elevsubjektivitet och heteronormativitet*. Göteborg 2017
- 406 ELIAS JOHANNESSON *The Dynamic Development of Cognitive and Socioemotional Traits and Their Effects on School Grades and Risk of Unemployment*. Göteborg 2017
- 407 EVA BORGFEJLDT *"Det kan vara svårt att förklara på rader". Perspektiv på analys och bedömning av multimodal textproduktion i årskurs 3*. Göteborg 2017
- 408 GÉRALDINE FAUVILLE *Digital technologies as support for learning about the marine environment. Steps toward ocean literacy*. Göteborg 2018
- 409 CHARLOTT SELLBERG *Training to become a master mariner in a simulator-based environment: The instructors' contributions to professional learning*. Göteborg 2018
- 410 TUULA MAUNULA *Students' and Teachers' Jointly Constituted Learning Opportunities. The Case of Linear Equations*. Göteborg 2018
- 411 EMMALEE GISSLEVIK *Education for Sustainable Food Consumption in Home and Consumer Studies*. Göteborg 2018
- 412 FREDRIK ZIMMERMAN *Det tillåtande och det begränsande. En studie om pojkars syn på studier och ungdomars normer kring maskulinitet*. Göteborg 2018
- 413 CHRISTER MATTSSON *Extremisten i klassrummet. Perspektiv på skolans förväntade ansvar att förhindra framtida terrorism*. Göteborg 2018
- 414 HELENA WALLSTRÖM *Gymnasielärares mentorshandlingar. En verksamhetsteoretisk studie om lärararbete i förändring*. Göteborg 2018
- 415 LENA ECKERHOLM *Lärarperspektiv på läsförståelse. En intervjustudie om undervisning i årskurs 4-6*. Göteborg 2018
- 416 CHRISTOPHER HOLMBERG *Food, body weight, and health among adolescents in the digital age: An explorative study from a health promotion perspective*. Göteborg 2018
- 417 MAGNUS KARLSSON *Moraliskt arbete i förskolan. Regler och moralisk ordning i barn-barn och vuxen-barn interaktion*. Göteborg 2018
- 418 ANDREAS FRÖBERG *Physical Activity among Adolescents in a Swedish Multicultural Area. An Empowerment-Based Health Promotion School Intervention*. Göteborg 2018
- 419 EWA SKANTZ ÅBERG *Children's collaborative technology-mediated story making. Instructional challenges in early childhood education*. Göteborg 2018
- 420 PER NORDÉN *Regnbågsungar: Familj, utbildning, fritid*. Göteborg 2018
- 421 JENNY RENDAHL *Vem och vad kan man lita på? Ungdomars förhållningsätt till budskap om mat och ätande utifrån ett forskarinitierat rollspel*. Göteborg 2018
- 422 MARTINA WYSZYNSKA JOHANSSON *Student experience of vocational becoming in upper secondary vocational education and training. Navigating by feedback*. Göteborg 2018
- 423 MALIN NILSEN *Barns och lärares aktiviteter med datorplattor och appar i förskolan*. Göteborg 2018
- 424 LINDA BORGER *Investigating and Validating Spoken Interactional Competence – Rater Perspectives on a Swedish National Test of English*. Göteborg 2018

425 ANNA-MARIA FJELLMAN *School choice, space and the geography of marketization – Analyses of educational restructuring in upper secondary education in Sweden.* Göteborg 2019

426 ANNELI BERGNELL *Med kroppen som illustration: Hur förskolebarn prat-skapar naturvetenskap med hjälp av multimodala och kroppsförankrade förklaringar.* Göteborg 2019

427 ANNE SOLLI *Handling socio-scientific controversy: Students' reasoning through digital inquiry.* Göteborg 2019

428 MARTIN GÖTHBERG *Interacting - coordinating text understanding in a student theatre production.* Göteborg 2019

429 SUSANNE STRÖMBERG JÄMSVI *Unpacking dominant discourses in higher education language policy.* Göteborg 2019

430 KURT WICKE *Läroböcker, demokrati och medborgarskap. Konstruktioner i läroböcker i samhälls-kunskap för gymnasiet.* Göteborg 2019

431 KATARINA SAMUELSSON *Teachers' Work in Times of Restructuring. On Contextual Influences for Collegiality and Professionality.* Göteborg 2019

432 HELÉNE BERGENTOFT *Lärande av rörelseförmåga i idrott och hälsa ur ett praktikutvecklande perspektiv.* Göteborg 2019

433 JANNA MEYER-BEINING *Assessing writers, assessing writing: a dialogical study of grade delivery in Swedish higher education.* Göteborg 2019

434 DAN FRANSSON *Game demands and fatigue profiles in elite football – an individual approach -Implications of training and recovery strategies.* Göteborg 2019

435 ELIN ARVIDSON *Physiological responses to acute physical and psychosocial stress – relation to aerobic capacity and exercise training.* Göteborg 2019

436 SUSANNE STAF *Skriva historia – literacyförväntningar och elevtexter i historieämnet på mellan- och högstadiet.* Göteborg 2019

437 VERONICA SÜLAU *Vad händer i lärares kollegiala samtalspraktik? En studie av mötet mellan en nationell kompetensutvecklingsinsats och en lokal fortbildningspraktik.* Göteborg 2019

438 MARIA OHLIN *How to Make Bicycling Safer – Identification and Prevention of Serious Injuries among Bicyclists.* Göteborg 2019

439 LINUS JONSSON *An empowerment-based school physical activity intervention with adolescents in a disadvantaged community: A transformative mixed methods investigation.* Göteborg 2019

440 ELIN NORDENSTRÖM *Feedback and instructional guidance in healthcare simulation debriefings.* Göteborg 2019

441 KATEŘINA ČERNÁ *Nurses' work practice in chronic care: knowing and learning in the context of patients' self-monitoring data.* Göteborg 2019

442 MARGARETHA HÄGGSTRÖM *Estetiska erfarenheter i naturmöten. En fenomenologisk studie av upplevelser av skog, växtilighet och undervisning.* Göteborg 2019

443 PANAGIOTA NASIOPOULOU *The professional preschool teacher under conditions of change – competence and intentions in pedagogical practises.* Göteborg 2020

444 ANNA TOROPOVA *Teachers meeting the challenges of the Swedish school system. Agents within boundaries.* Göteborg 2020

445 ANNA LUNDBERG *Att lära om proportionalitet i den svenska skolan – en studie av läromedel, nationella prov samt lärprocesser i klassrummet.* Göteborg 2020

446 ULF RYBERG *Att urskalja grafiska aspekter av derivata – hur elevernas möjligheter påverkas av innehållets behandling i undervisningen* Göteborg 2020

447 KASSAHUN WELDEMARIAM *Reconfiguring Environmental Sustainability in Early Childhood Education: a Post-anthropocentric Approach* Göteborg 2020

Reconfiguring Environmental Sustainability in Early Childhood Education

a Post-anthropocentric Approach

This dissertation centers on conceptual engagement in environmental sustainability within the field of early childhood education, ECE. It problematizes the anthropocentric characteristics of ECE and seeks post-anthropocentric possibilities of engaging with environmental predicaments. Theoretically, it is framed within posthuman thinking. Methodologically, it draws ideas from post-qualitative inquiry.

The dissertation makes knowledge contributions in the following four aspects. First, drawing on empirical data, sustainability is introduced as a generative concept beyond social, human and cognitive affairs. Second, the work challenges the idea of a rational, ethical and agentic child, and explores possibilities for engaging with the unfolding, relational and affective child and its implication for sustainability. Third, the dissertation reasons that since humans are already multiple and enmeshed with the non-human world, learning for sustainability must consider alternative forms of learning such as ‘becoming-with’, ‘learning-with’, ‘learning to be affected by’ non-human others. Fourth, the work highlights the non-humans as knowledge-creating actors/entities, and puts forward the idea of researching with non-human forces and other species apart from researching with humans/children.

In the end, the post-anthropocentric approach is not presented as a panacea for solving the current ecological problems, but rather as a much needed attempt to deal with one of the symptoms (excessive emphasis on human-centeredness) by decentering the human and seeing humans’ entangled relationships with non-human others.



Kassahun Weldemariam has previously worked as a lecturer and teacher trainer at Dilla University in Ethiopia, and as a preschool pedagogical leader in Stockholm, Sweden. His main research interest falls under the umbrella subject of Early Childhood Education for Sustainability. Other research areas include: commercialization of childhood and its implication for sustainability, play in ECE, professionalism in ECE, bilingualism, biliteracy and children’s reasoning with numbers.