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Anna Lehtonen

Drama as an interconnecting approach for climate change education

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Abstract

Climate change and the wider sustainability crises question the traditional, modern understanding of humanness and learning. Developing complementary participatory approaches that consider emotional aspects, students' perspectives and roles is an acute need in climate change education that aims to address this complex challenge that threatens the conditions and continuation of life on our planet Earth.

This dissertation aims to (1) reflect on the pedagogical challenges of climate change education related to interconnectedness and humanness; and to (2) illustrate how drama can serve as a complementary approach that can promote the awareness of interconnectedness and provide interconnected knowing of human aspects and psychosocial issues of climate change education. The research questions are: (1) What kind of awareness of interconnectedness is essential in climate change education and why? (2) How can drama promote a sense and understanding of interconnectedness and relational sustainability competences? (3) What kind of knowing and understanding can drama promote related to futures education, and to human and psychosocial aspects of climate change?

The thesis is based on four studies. The first study provides a theoretical reflection on the pedagogical challenges of climate change education related to modern dichotomies. The study defines the principles for the pedagogy of interconnectedness that underline the essentiality of understanding the world, global ecosocial systems as interconnected, and humans and learning as relational. It also emphasizes the critical consciousness of individuals having a relevant role in the collective global eco- and psycho-social reality.

In the second, third and fourth study drama was used as performative, arts-based and practice-led research. During the arts-based, practice-led research processes the researcher aimed to facilitate performative inquiries and capture and interpret performative syntheses generated with the participants. The second study enlightens the potential of drama as an interconnecting approach for climate change education related to sustainability competences. The study draws on a special course "Drama in education for a sustainable future" where experienced drama education students reflected on the potential of drama for sustainability based on their participation experiences. The third study illustrates how futures improvisation practices and a long devising theatre process can serve futures education goals by enabling exploration and reflection on imaginary futures associations and thus, engage in thinking proactively about the future. In the fourth study, devised theatre principles were applied for exploring young people's perspectives to climate change in the context of short performance workshops.

Based on the findings of the four studies I argue that drama can serve as a complementary, interconnecting and arts-based approach for climate change education. Being differently in the interconnecting space of drama, in a serious playful, embodied active and dialogical mode can promote an essential sense and awareness of interconnectedness, elevate critical perspectives on the prevailing social reality and envisioning alternative futures, and be a motivator for change.

Studies 2−4 offer four examples of complementary, arts-based, performative and interconnected knowing typical of drama. The second workshop generated (1) poetic, experiential knowing in which the participants' experiences and imagined encounters in the forest and memories of childhood intertwine. The still image practice (study 2, workshop 3) exemplified (2) the experienced, embodied, dialogical, intercorporeal knowing that is very typical of drama. The pictures of this still image practice manifest the participants' experiences and reflection about drama for sustainability education, how drama elevates self-reflection besides the collective creative process, enables exploring human aspects of climate change through role-taking, evokes critical thinking through experience, allows practising and motivates action. The third study illustrates how improvisation practices engendered associative, imagined futures visions that reflected prevailing attitudes, images and media. The performance narratives produced with the young school conference participants during the fourth study serve as examples of dramatic, narrative knowing that is typical of drama. The performance narratives addressed issues brought up by the participants and manifested relevant psychosocial issues. The issues of responsibility, indifference, bypassing and alienation were shown through the theatrical forms of tragedy, parody and awakening.

Studies 2-4 demonstrated how the various embodied, emotionally engaging drama practices enable the production of relevant material for deepening critical, social reflections of cultural norms, collective attitudes and assumptions about humanity, climate change and futures. However, facilitating drama for climate change education necessitates specific skills, and ethical and pedagogical considerations. At best, drama can foster social reflexivity and contribute interesting material for social reflection and further interpretation and critical insights about climate change education and about current ways of thinking about climate change as an experienced, psychos ocial issue. These aspects are valuable for developing climate change education and for promoting social transformations to sustainability.

Keywords: climate change education, drama, futures education, arts-based research

Helsingin yliopisto, Kasvatustieteellinen tiedekunta

Kasvatustieteellisiä tutkimuksia, numero 118

Anna Lehtonen

Draama yhteyksiä vahvistavana lähestymistapana ilmastokasvatuksessa

Tiivistelmä

Väitöskirja tarkastelee ilmastokasvatuksen ihmisyyteen ja maailmankuvaan liittyviä pedagogisia haasteita ja valaisee draaman mahdollisuuksia yhteyksiä vahvistavana pedagogisena ja tutkimuksellisena lähestymistapana ilmastokasvatuksessa. Tutkimuksessa kysytään: Miksi ja millainen yhteyksien tiedostaminen on keskeistä ilmastokasvatuksessa? Miten draaman kautta voidaan mahdollistaa yhteyden kokemuksia ja relationaalisia kestävyysvalmiuksia? Millaista relationaalista tietämistä ja ymmärrystä draaman kautta voidaan tuottaa ilmastonmuutoksesta koettuna, psykososiaalisena, ihmisyyteen liittyvänä ilmasto- ja tulevaisuuskasvatuksen haasteena?

Väitöskirja perustuu neljään osatutkimukseen. Ensimmäinen osatutkimus käsittelee ilmastokasvatuksen metatason haasteita modernin dikotomisen ajattelun näkökulmasta ja selittää kirjallisuuteen perustuen, miksi yhteyksien tiedostaminen on keskeistä ilmastokasvatuksessa. Ensimmäisessä osatutkimuksessa määritellään yhteyksien pedagogiikan periaatteet, jotka kiteyttävät, miten ilmastonmuutoksen todellisuudessa on keskeistä vahvistaa ymmärrystä maailmasta ja ihmisestä osana (ekososiaalisia) systeemejä sekä pedagogisesti ymmärtää oppiminen holistisesti ja tietäminen relationaalisesti. Lisäksi ensimmäinen osatutkimus korostaa, miten yksilöillä on merkityksellinen rooli osana yhteistä eko- ja psykososiaalista todellisuutta.

Toisessa, kolmannessa ja neljännessä osatutkimuksessa draaman työtapoja sovelletaan taideperustaisen, käytäntöjohteisen (practice-led) tutkimuksen tapaan. Tutkijan tehtävänä oli ensin suunnitella ja ohjata ryhmän luova tutkiva prosessi, taltioida se ja tulkita syntyneitä performatiivisia synteesejä.

Toinen osatutkimus valaisee draaman potentiaalia ilmastokasvatuksessa yhteyksiä vahvistana lähestymistapana relationaalisten kestävyystaitojen näkökulmasta. Toinen osatutkimus kohdistuu draamaopiskelijoille pidettyyn erikoiskurssiin “Draama in education for a sustainable future”, jonka aikana opiskelijat reflektoivat draaman potentiaalia suhteessa heidän osallistumiskokemuksiinsa. Kolmannessa osatutkimuksessa selitetään, miten draamakasvatuksen improvisaatioharjoitusten ja näytelmän rakentamisprossessin kautta voidaan vahvistaa ja tarkastella lasten ja nuorten tulevaisuusajattelua, -kuvittelua ja -oppimista. Neljännessä osatutkimuksessa devising-teatterin periaatteita sovelletaan nuorten ilmastonmuutosajattelun tutkimiseen.

Osatutkimukset valaisevat esimerkein, miten draaman kautta voidaan (1) vahvistaa systeemistä ymmärrystä maailmasta ja ihmisten erilaisista näkökulmista ja kokemuksista, (2) herättää kriittistä tietoisuutta yhteisöllisistä tavoista suhtautua tulevaisuuteen ja ilmastonmuutokseen, (3) visioida vaihtoehtoisia tulevaisuuksia sekä (4) luoda välittävä, kuunteleva ja yhteyksiä vahvistava tila. Draaman yhteyksiä vahvistavassa tilassa voidaan olla yhdessä eri tavalla ja tutkia ryhmän ajattelua ja yhteisiä mielikuvia luovassa vuorovaikutuksessa ja toiminnassa. Draamam luomassa luovassa tilassa ja toiminnassa osallistujien mielikuvat, tunteet, kehollinen, kuvitteleva ja käsitteellinen ymmärrys integroituvat ja jalostuvat performatiivisiksi synteeseiksi.

Osatutkimukset tarjoavat neljä esimerkkiä draaman kokonaisvaltaisesta tietämisen tavoista. Toisen osatutkimuksen metsätyöpajassa syntyi (1) *kokemuksellista ja poeettista (runollista) tietämistä*, joissa yhdistyivät osallistujien kokemukset kuvitelluista kohtaamisista metsässä sekä muistot lapsuudesta ja jota tutkijan kirjoittama tutkimusruno kuvaa. Toisessa osatutkimuksessa kuvat draamaopiskelijoiden nk. patsastyöskentelystä (still image) ovat esimerkki draamalle hyvin tyypillisestä (2) *eläytyvästä, kehollis-dialogisesta, reflektiivisestä tietämisestä*. Draamaopiskelijoiden reflektoinnin perusteella draama mahdollistaa kokemuksellisen oppimisprosessin, itsereflektion luovan ryhmätyöskentelyn rinnalla ja ihmisten kokeman ilmastonmuutoksen tutkimisen roolityöskentelyn kautta. Lisäksi draama mahdollistaa vaikuttamisen harjoittelemisen ja kokemukset draamasta voivat herättää sekä kriittistä ajattelua että halun toimia vastuullisemmin. Kolmannen osatutkimuksen teatteri-improvisaatioharjoituksissa syntyi (3) *assosiatiivista, tulevaisuutta kuvittelevaa, visioivaa tietämistä*. Improvisaatioharjoitukset tuottivat assosiatiivisia, mielikuvituksellisia tulevaisuusvisioita, joissa heijastuu yleisiä asenteita, scifi-elokuvien kuvia tulevaisuudesta. Neljännen osatutkimuksen nuorten kanssa koululaiskonferenssissa tuotetut esitystarinat taas ilmentävät *dramaattista, narratiivista tietämistä*, joka myös on draamalle hyvin tyypillistä. Esitystarinat käsittelivät nuorten esittämiä haastavia kysymyksiä ja asenteita. Kysymykset vastuusta, välinpitämättömyydestä, ohikulkemisesta ja vieraantumisesta esitettiin teatterin – tragedian, parodian ja heräämisen keinoin.

Draamatoiminta voi tuottaa rikasta materiaalia, erilaisia taiteellisia synteesejä osallistujien ajattelusta, heidän kokemasta ilmastonmuutoksesta ja tulevaisuudesta. Draamallisen toiminnan ohjaaminen vaatii kuitenkin ohjaajalta erityisiä taitoja, pedagogista ja eettistä herkkyyttä ja harkintaa. Parhaimmillaan draama voi tuottaa olennaista, merkityksellistä tietoa ilmastonmuutoksesta psykososiaalisena, sosiaalisena ja koettuna haasteena, mikä on arvokasta ilmastokasvatuksen kehittämisen kannalta.

Avainsanat: ilmastokasvatus, draama, tulevaisuuskasvatus, taideperustainen tutkimus

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Ei olisi koko tutkimusta syntynyt.
En olisi osannut enkä uskaltanut.
En olisi innostunut, en jaksanut, en kaikkea kestänyt.
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Espoo
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Anna Lehtonen

Contents

List of original articles

This thesis is based on the following studies:

Lehtonen, A., Salonen, O., Cantell, H. & Riuttanen, L. 2018. Pedagogy of interconnectedness for encountering climate change as a wicked problem. *Journal of Cleaner Production*, *199*, 860−867.

Lehtonen, A., Österlind, E. & Viirret, T. L. 2020. Drama in education for sustainability – becoming connected through embodiment. *International Journal of Education & the Arts*, 21(9).

Lehtonen, A. 2012. Future thinking and learning in improvisation and a collaborative devised theatre project within primary school students. *Procedia - Social and Behavioral Sciences 45.* 104−113.

Lehtonen, A. & Pihkala, P. 2021. Encounters with climate change and its psychosocial aspects through performance-making with young people. *Environmental Education Research*. 27(5). 743-761.

1 Introduction

‘Mission impossible’ – an imagined lesson

> Teacher: Today we are going to talk and study about climate change.
> Student 1: Teacher, why do we need to talk about climate change? It feels bad!
> Teacher: Hmm, yes, climate change is a serious issue that often evokes challenging feelings. However, I hope that talking and studying might help to release the negative thoughts.
> Student 2: Shouldn’t we switch off the lights?
> Teacher: Well, yes, we should. Could you do it?
> We sit in the Finnish December darkness without much daylight and talk about climate change. The students do not seem to be willing to talk much. In order to add some content to our thinking we take out the study books, study the facts about climate change and switch some of the lights on again.
>
> In order to get to know about the causes of climate change and what we could all do to reduce emissions we end up by making carbon footprint tests. I as the teacher walk around in the class observing students making personal tests on computers and ask about the results.
> Teacher: What kind of results did you get? In Finland we produce so much CO_2 that we would need 3,8 globes[1] if everyone lived on the globe like we do. We produce a lot of emissions in Finland especially due to our cold and dark winters.
> The students are rather quiet and not very willing to tell their results. I see one student writing down the result of five globes.
>
> The break bell rings and the students quickly disappear.
> It is dark and silent.
> The teacher stands alone in the classroom and thinks: No light in the room or outside, or in my or my students’ minds.

This imagined lesson about climate change with 12-year-old students is based on my ten years of experience about climate change education. My interest in this study derives from my personal experiences of a contradiction between the goals and rhetoric of environmental education in the curricula and the actual practice in schools. I have often felt that environmental education is both inefficient and

[1] WWF Finland (2019) reports a Finnish carbon footprint as 3.8 globes in the over-consumption day bulletin.

meaningless, while consumerism on the other hand is the dominant force. Despite my special studies in environmental education and doctoral studies, climate change education still often feels like a mission impossible. The topic evokes challenging questions, contradictions and emotional responses in me and my students. It feels impossible to realize the principles of sustainable development and sustainability education goals.

Schools can not offer models of sustainable practices or visions of more sustainable futures, because school is part of or surrounded by unsustainable assumptions of consumerism and progress deriving from capitalism. Therefore, critical reconsideration and reflection on educational goals and practices have been regarded as important (e.g. Värri 2018). A central question of climate change education is whether education confirms the identity and role of humans as consumers, causing environmental problems, or whether we are given real opportunities to act towards climate change mitigation (Cantell, Tolppanen, Aarnio-Linnanvuori & Lehtonen 2019; Reid 2019). Additionally, it is relevant to reconsider what can be regarded as 'sustainability' or 'well-being' in climate change education (Lehtonen, Salonen & Cantell 2018).

The current Finnish National Curriculum for Basic Education (2014) introduced ecosocial education, namely understanding the seriousness of climate change and striving for sustainable action. Ecosocial education emphasizes the knowledge and ability to underline the priority of ecology and giving serious consideration to climate change and planetary borders as the basis for sustainable societal wellbeing. Irmeli Halinen (2018, 84) writes about the current Finnish National Curriculum for Basic Education (2014):

> *The school demonstrates its responsible attitude towards the environment by its everyday choices and activities. The school's task is to inspire hope for a good future by laying the foundation for eco-social knowledge and abilities. Students' active involvement in planning and implementing sustainability in everyday life is regarded as crucial.*

Climate change was brought up for the first time in the current Finnish National Core Curriculum for Basic Education and environmental responsibility is emphasized more than ever before (Aarnio-Linnanvuori 2019, 5). In addition, educating active citizens and the necessity of a sustainable way of life are among the four pillars of the underlying value-basis of the current Finnish curriculum (Halinen 2018, 81). The ethical aspects of climate change mitigation should be integrated into the teaching of several subjects (e.g. natural sciences, history, religion and arts). Teachers should address ethical issues related to climate change even as part of natural sciences teaching, where the ideal of value-free, objective knowledge has remained strongest.

The current curriculum also emphasizes students' active agency. The goal, as Åhlberg et al. (2014, 233) put it, is to educate "community-oriented human beings" who "understand the balance between freedom and responsibility" and who "apply social and ecological information to a wide range of world situations".

Unfortunately, the vital principles of sustainable development and educating environmentally aware and responsible citizens in the current curriculum are often mere rhetoric in the actual school situation. As Alan Reid (2019, 770) has noted, despite increasing efforts in environmental/sustainability education and intensified public debate about climate change action, the challenging gap between knowledge and action, rhetoric and practice remain, and the paradoxes of environmental education persist. Similar challenging gaps between education and sustainability have been also pointed to in wide studies of environmental education in the Finnish school context (Mykrä 2021) and in the environmental and educational philosophy of Lili-Ann Wolff (2011)[2].

Reid (2019, 770, referring to Biesta 2014) calls for questioning whether education and educators are "contributing to both the problems and solutions to the climate crisis". It is questionable if education serves only as a *qualification* ("providing participants with the knowledge, skills, and dispositions that allow them to 'do something'"), and as *socialization* in existing unsustainable traditions and ways of doing and being (Reid 2019, 777–778), or if in education learners are seen "as subjects of initiative and responsibility rather than as objects of the actions of others" (Reid 2019, 777−778). As climate change education is an emancipatory pedagogy, it is essential to acknowledge the logic of emancipation, e.g. who has the power of knowing the truth and setting the rules of interaction (Biesta 2014).

In matters to do with climate change there is a contradiction between knowhow and action, namely, the ambivalence of not behaving according to the awareness of serious impacts and the need for mitigating actions. As Lertzman (2015) has pointed out, this is a psychological challenge elevating distress and need for coping (Lertzman 2015). According to Lertzman (2015), ambivalence is an essential issue in education and communication as it prevents people from engaging in climate action. People have a need to find personal creative and constructive solutions to psychological contradictions and ambivalences that would help them engage in responsible environmental actions. The worst situation is to neglect the

[2] Niina Mykrä identifies 21 dilemmas in schools' environmental education praxis, while Lili-Ann Wolff (2011) specifies seven dilemmas between education and sustainability in her review of educational philosophy from Rousseau to Foucault. There are also gaps between human knowledge and action; the moral dilemma that exists between private individual desires and social obligations; the gap between human and nature; distanciation of the knowing researcher from the research context; and the gap between people having power and not having knowledge of sustainability. The last gap Wolff mentions is between sustainability of today and the future.

evolving challenging emotional reactions, and the psychological and social challenges of changing lifestyles related to sustainability Lerzman (2015) points out. This does not mean underrating the life-style changes that are needed as essential and effective mitigation actions.

According to research, young people are among the most vulnerable groups that suffer from the psychosocial impacts and dynamics of climate change such as eco- and climate anxiety[3] (Clayton, Manning, Krygsman & Speiser 2017; Cunsolo & Ellis 2018, 278; Pihkala 2019). Most problematic for young people is the tendency to cope with climate anxiety by so-called socially constructed silence (Norgaard 2011) or by disavowing the meaning of climate change. Silence or neglect as adults' responses may cause young people to feel isolated, alienated, and sometimes angry or depressed (Brown 2017; Winograd 2017, 265).

Especially young activists in Finland regard societal actions for climate change mitigation as insufficient (Piispa, Ojajärvi & Kiilakoski 2019). Likewise, teenagers in Finland and around the world seem to have been disappointed with and frustrated by politicians' and adults' ineffective climate change mitigation actions and plans related to the seriousness of global warming, as millions of young protestors have followed Greta Thunberg in school strikes.

In the reality of climate change, the future perspective is more crucial than ever before, but young people might well feel that their future has been lost (Eagleton 2015; Ojala 2017). According to research, young people in Finland, when asked to think and write about the future, find it easier to create dystopias than utopias. Desolation is regarded as a more possible and realistic scenario for the future than development (Särkelä & Suoranta, 2016; Grund & Brock 2019). International studies also indicate that although many young people show an interest in the global future, feelings of helplessness and hopelessness are quite common (Strife 2012; Threadgold 2012; Nordensvard 2014; Ojala 2017). As dystopian images and threatening, complex sustainability and climate crises overshadow the future, positive future expectations, and resources for hope and a meaningful life have been 'stolen' from the younger generations. However, young people's attitudes and responses to climate change are not homogenous. According to both European and Finnish barometers[4], even though environmental concern is a general phenomenon within different age groups, indifferent attitudes are also usual.

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3 Eco-anxiety has been defined as "a chronic fear of environmental doom" (Clayton, Manning, Krygsman & Speiser 2017, 68) and as "the generalized sense that the ecological foundations of existence are in the process of collapse" (Albrecht 2012, 250). Panu Pihkala (2019, 2) defines climate anxiety as "an aspect of the wider phenomenon of eco-anxiety" that "encompasses challenging emotions, experienced to a significant degree, due to environmental issues and the threats they pose"

4 Special Eurobarometer on Climate Change in 2019 by the European Commission (2019), and according to the national survey on climate emotions and sustainable life-style choices by Sitra in 2019, 38 % of under 30-year-olds feel ecoanxiety.

Addressing seemingly impossible, wicked issues like climate change demands complementary ways and skills of knowing alongside traditional scientific, analytical and mechanistic problem-solving strategies (Kagawa & Selby 2010, 242). Comprehensively, we cannot solve the complex, wicked sustainability problems with the same kind of thinking we used when we created them, as Albert Einstein is reputed to have said. Similarly, Richard Bateson (1972) has stated in his much quoted writings about sustainability education that there is a need for epistemic paradigm change, "seeing differently" alongside changes in cognition and metacognition that mean doing things better and doing better things[5]. Kagawa and Selby (2010, 242–243) explain, "There is a need for complementary and recursive use of artistic, embodied, experiential, symbolic, spiritual, and relational learning, especially in the vital educational task of reconnecting learners to the earth while enabling them to discover their connected identity and realize their full potential." Besides, the challenging emotional responses such as denial and disavowal[6] or contradictions are difficult to encounter in education through traditional teaching methods.

In order to develop climate change education, Kagawa and Selby (2010) call for the following qualities: addressing root causes; holistic and social approaches; interdisciplinary and multidisciplinary frames; including both global and local aspects and especially global climate justice education. In order to strengthen engagement and meaningfulness in studying, young students' experiences and perspectives should be included in climate change education (Degerman 2016; Hermans 2016¸ Särkelä & Suoranta 2016). Deliberative discussions could enrich students' thinking with others' viewpoints and learners could be engaged in designing and implementing school or community projects for climate action (Monroe et al. 2017, 11). Complementary forms of teaching, learning and ways of knowing have been regarded as vitally important in creating effective responses to the prevailing immense sustainability crises (e.g. Kagawa & Selby 2010).

In this thesis, I consider drama to be an arts-based practice and research method to explore the human and social aspects of climate change education. The research interest lies both in the interconnecting characteristics of drama and in the form of understanding and performative or performed knowing[7] that drama can bring to

[5] E.g. Stephen Sterling (2010) has quoted Bateson (1972) and defined this change related to transformative learning. Transformative learning is the term that is much used to define the need for change, but it is not used in this thesis as it is an abstract, indefinite, non-descriptive concept with a complex theoretical background. However, the term transformative aesthetic learning is referred to as a theory much used in drama education on page 33–34

[6] *Disavowal* means underrating the personal significance of an issue.

[7] *Understanding* refers to cognitive meaning-making, whereas *knowing* refers to a more holistic state of being aware or becoming informed. I use the term knowing, not knowledge in the context of drama and arts, by which I emphasize the specific nature of the understanding these approaches can elevate. *Performative* refers to the knowing that is generated, made visible and/or shared through performing.

climate change education. My interest is epistemological and emphasizes drama for understanding. I am interested, as Østern (2006, 10) writes, in "the kind of knowledge drama may provide for studying the human condition" and "how the knowing can be produced and how it emerges in drama".

This thesis tells my stories as well as the experiences and reflections of my co-authors and participants when I experimented with various methods in addressing current topics of climate change education. During this dissertation process, I have expected that drama can have value as a complementary approach that can generate performative knowing of human, futures education, and psychosocial aspects of climate change. During my experimentations with various methods of drama education, I have investigated what kind of complementary knowing drama may generate. The term 'performative knowing' refers to the core of drama, namely imagination and reflection through improvisation and performing.

My idea is to use drama for "diagnosing the current", fostering social reflection and actively constructing and creating alternative, more connected and sustainable social realities. This idea resembles critical pedagogy (see Suoranta 2005, Freire 1968/2018). With the help of students' perspectives, I expect that drama may promote diagnosing not only the unsustainability of prevailing attitudes, social and societal practices, but problematic unsustainable pedagogical praxis and school cultures. The idea of making drama is to make visible and question prevailing ideas, experiences and cultural attitudes and to promote dialogue through drama with participants: What kind of images we have, what do we think and from where do our thoughts derive? What do we want to think?

1.1 Research aims and questions

The aim of this dissertation is to reflect on the pedagogical challenges of climate change education related to human and social perspectives and how drama could respond to these challenges and needs for complementary methods in climate change education. More specifically, the aims of this dissertation are:

(1) to promote critical pedagogical awareness of essential interconnectedness in climate change education related to modern dichotomies and an awareness of human and social aspects of climate change.

(2) to enlighten how drama can promote a sense and awareness of interconnectedness in climate change education and to illustrate the kind of knowing and understanding drama can promote related to human, future and psychosocial aspects of climate change.

The thesis consists of four studies. The first study provides a theoretical basis for an awareness of interconnectedness related to modern thinking in dichotomies and defines the principles of the pedagogy of interconnectedness. The second study reflects on and illustrates how drama can promote essential awareness of

interconnectedness for sustainability education. The third study focuses on futures images through improvisation. The fourth study addresses young people's perspectives on climate change through performance-making.

In this thesis, I aim to answer the following research questions:

1. What kind of awareness of interconnectedness is essential in climate change education and why?
2. How can drama promote a sense and understanding of interconnectedness and relational sustainability competences?
3. What kind of knowing and understanding can drama promote related to futures education, and to human and psychosocial aspects of climate change?

The 'why' question refers to theoretical understanding and 'how' refers to practice. The questions about 'what' are answered by the demonstrative examples of performative knowing and thinking that drama provides. I base my argumentation on the explanations of drama practices, on the knowing that evolved and was created with the participants during the drama practices, and on my theoretical reflections of these practices. Finally, the reflective discussions (during the second study) among experienced drama education students complete my understanding of the potential value and meaning of drama in climate change education.

1.2 Outline of the thesis

In chapter 2, I define and reflect on goals and challenges of climate change education. I refer to the different aspects of climate change education that were focused on in studies 1−4. I reflect on and refer to the literature of 1) changing worldviews related to dichotomized thinking, 2) sustainability competences, 3) futures education and 4) psychosocial aspects of climate change education. In chapter 3, I define the concepts of drama and drama education and construct the theoretical basis for drama as interconnected learning. In chapter 4, I present the arts-based and practice-led methodological basis for the whole dissertation and reflect on the epistemology of drama as a way of knowing. In chapter 5, I present the studies 1−4. I explain the pedagogical ideas, praxis, methods applied and findings. Finally, in chapter 6, I respond to the research aims and questions and ponder on the meaning of this dissertation and the specific skills needed when using the performative approaches in climate change education and research. 1.2 summarize the reflections on the praxis of studies 1−4, and present future research interests.

2 Climate change education

In this section, I refer to the literature of climate change education and its definitions, various aspects, goals and challenges. Firstly, I refer to the definitions of goals and challenges of climate change education on a general level and review Finnish research on climate change education. After that, I address the different aspects of climate change education that were the focuses of studies 1−4. Section 2.2 provides background for study 1's perspectives on climate change education, such as changing worldviews − from modern thinking in dichotomies and alienation to vital awareness of interconnectedness. Section 2.3 structures the goals and essence of climate change education related to relational sustainability competences that served as the frame of analyses for study 2. Section 2.4 presents the principles of futures education that were the focus of study 3, whereas section 2.5 reflects on challenges of climate change education related to psychosocial issues (the theme of study 4). These sections also provide reviews on previous research on the potential of arts to address these aspects of climate change education.

2.1 Climate change education and its special challenges

Education has been regarded as having a key role in preparing societies for global changes, in achieving sustainable development goals and putting into practice global agreements on climate change mitigation[8] (UNESCO 2017). Since 1992 climate change education (CCE) has been regarded as "a necessity within a suite of prevention, mitigation and adaptation strategies" (Reid 2019, 767; see also Anderson 2010; Kagawa & Selby 2010; UNESCO & UNEP 2011; Jickling 2013). UNESCO (2015, 3) has established, that CCE is essential "in helping populations understand and address the impacts of climate change, and in encouraging the changes in attitudes and behavior needed to help them address the causes of climate change, adopt more sustainable lifestyles and develop skills that support different modules of economies, as well as to adapt to the impact of climate change."

[8] Climate change mitigation has been defined by the United Nations as human intervention to reduce the sources of greenhouse gas emissions primarily linked to human actions of production and consumption (Mochizuki & Brian 2015; UNESCO/UNEP, 2011). Mitigation efforts include a range of interventions to stabilize and reduce greenhouse gas concentrations such as investing in renewable, non-polluting energies and designing greener technologies, conserving energy, promoting changed consumption patterns and lifestyles, and re-orienting economies, social structures, value systems and ideologies that have resulted in the emission of excessive greenhouse gases.

CCE has been referred to as an essential aspect of environmental education and education for sustainable development and is included as part of UNESCO's Global Action Programme on Education for Sustainable Development (ESD). CCE points at the necessity of environmental education and sustainability education[9] in considering planetary boundaries of sustainability and integration of environmental and sustainability aspects not only necessary in education, but also in global, societal decision-making (Mochizuki & Brian 2015).

The main goals of climate change education are 1) to promote understanding of the causes and consequences of climate change, 2) to prepare learners to live with the impacts of climate change (adaptation) and 3) to empower them to take appropriate actions to adopt more sustainable lifestyles (mitigation) UNESCO (2015).[10]

Climate change education necessitates careful pedagogical consideration due to the complex, specific physical, social and cultural nature of climate change (Cantell, Tolppanen, Aarnio-Linnanvuori & Lehtonen 2019). Misconceptions related to the nature of greenhouse effect, global warming and effective mitigation strategies are common and pose a challenge for CCE (e.g. González-Gaudiano & Meira-Cartea 2010). Dismantling misconceptions is challenging even in teacher education (Ratinen 2016)[11], and textbooks contain and reinforce them (Aarnio-Linnanvuori 2018). Additionally, the emotional aspects of climate change, denial and disavowal might strengthen misconceptions (Norgaard 2011). As a response, Monroe et al. (2017, 11) recommend developing the effectiveness of CCE by addressing misconceptions, interaction with scientists and engaging learners to the utmost in designing and implementing school or community projects for climate action.

Climate change raises deep, emotionally laden issues related to existence, humanity, society, culture and ethics that have often been excluded in education (Selby 2010). Nevertheless, students are often interested in the ethical issues of climate change and show a desire to look at environmental issues from many different perspectives, such as ethical, societal and political issues and the reliability of knowledge (Tirri et al. 2012; Tolppanen 2015; Tolppanen & Aksela 2018)[12].

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9 Environmental education and education for sustainable development/sustainability education seem to be overlapping terms. Both environment and sustainability can cover ecological, cultural, social and economic perspectives (Aarnio-Linnanvuori 2018, 16-18).

10 I mainly use the term 'climate change education' in this thesis and focus on especially social and human aspects of climate change. I understand CCE to include aspects of environmental education, education for sustainable development and sustainability education. In addition, I refer to sustainability education when I emphasize the wider content of sustainability and the term 'education for a sustainable future' is used in study 2 to underline the focus on ecological sustainability in futures education.

11 Ilkka Ratinen (2016) investigated pre-service primary school teachers' understanding of climate change in the frame of science teaching.

12 Sakari Tolppanen's (2015) doctoral studies investigated CCE related to science students' interests in climate change.

Environmental education focuses too much on individual learning and responsibility, whereas collective responsibility gains less attention (Aarnio-Linnanvuori 2019). Especially the emotional aspects of CCE have been regarded as most challenging and demand careful consideration and interfere in both teaching and learning (Hermans 2016[13]; Ojala 2017; Aarnio-Linnanvuori 2019; Pihkala 2019). A specific focus should be on dealing with uncertainty and hope in sustainability education (Ojala 2012a; 2012b; 2017; Hicks 2014). Traditional models or modes of environmental education and sustainability education have been regarded as insufficient to meet the needs of depicting climate change education and to cover the broad scope of climate change and holistic approaches are called for (Cantell et al. 2019)[14].

2.2 Changing worldviews: from modern thinking to relational understanding

Awareness of root causes of unsustainability, critical consideration of prevailing ways of thinking and understanding the world and its relations have been regarded as fundamental for developing climate change education (Kagawa & Selby 2010, 242–243). "The unwanted results of sustainability crises seem to be linked to our narrow understanding of the complex interactions between environmental, social, economic and cultural issues", Laininen (2018), quoting to Bateson (1972), states. Modern[15] worldview and its conceptions of assumptions of e.g. individualism, instrumentalism, objectivism[16], and mechanism[17] have been regarded both as roots of unsustainability and as inappropriate in promoting sustainable thinking.

Even though new emerging thoughts indicate that a more sustainable worldview might emerge, the modern worldview with its hierarchies still influence prevailing thinking, language, societal structures and education (Wolff 2011;

[13] Mikaela Hermans (2016) explored geography teachers and their 9th grade students' attitudes and emotional coping strategies.

[14] The holistic 'bicycle' model for climate change education illustrates how various aspects of CCE are interconnected. This model has been further developed by Ratinen, Muotka and Kinni (2019).

[15] Modern refers to the commonly used but questioned (for example by Bruno Latour) terms of Modern era and Modernity. Modernity is a loosely defined concept delineating a number of societal, economic and ideological issues that contrast with "pre-modern" or post-modern times or societies. Modern era refers to an ensemble of particular socio-cultural norms, attitudes and practices that arose in the 17-18th centuries in the time of the Renaissance and the Age of Reason and the Enlightenment.

[16] Laininen (2018, 172), referring to Norgaard (1994), explains objectivism as the assumption that "We can stand apart from what we are trying to understand."

[17] Laininen (2018, 172), referring to Norgaard (1994), explains the mechanism as "Relationships between parts are fixed, systems move smoothly from one equilibrium to another, and changes are reversible."

Martusewitcz, Edmundson & Lupinacci 2014)[18]. Therefore, critical awareness of how modern conceptions still reflect current cultural and societal systems is essential (Wolff 2011; Martusewitcz, Edmundson & Lupinacci 2014; Foster & Martusewicz 2018; Laininen 2018; Lehtonen, Salonen & Cantell 2018).

The roots of unsustainability seem to compound with the segregated thinking and dualistic worldview typical for modern times that has replaced the perception of human beings as an integral part of nature. Individualism, instrumentalism, mechanistic thinking, ideals of objectivism and Cartesian dualism have also been questioned and invalidated as promoting wicked sustainability issues like climate change (Wolff 2011; Martusewitcz, Edmundson & Lupinacci 2014; Foster & Martusewicz 2018; Laininen 2018; Lehtonen, Salonen & Cantell 2018). Naess and Haukeland (2008, 88) argue that instrumental rationalism "interpreted in relation to technical considerations, within a strict economic framework, related to short-term not to ultimate values", has been regarded as problematic as it results in overconsumption of natural resources.

Sustainability crises and CC are unintended, collective results of individual action, as Steven Vogel (2015) and Suvielise Nurmig (2020) have stated. Hence, individual moral agency and instrumental rationality have been questioned in the reality of ecosocial sustainability crises (Nurmi 2020). Nurmi (2020, 286) writes that "environmental responsibilities" need to be extended "to concern collective actions, both intentional and unintentional", because all these kinds of actions "have influences in material and ecosocial conditions of knowledge formation and emotional reactions, memories of previous actions and reactions to them, and even creative thinking that constructs the futures conditions of actions". According to Suvielise Nurmi's (2020) profound philosophical study[19], moral agency and responsibility should be considered relational and be widened from individual acts and intentions to concern all types of relationships with the environment. Besides, rationalism should be redefined in relation to sustainability (Nurmi 2020).

Rationalism should be directed to focus on the fundamental vital values and aims of our lives (Naess & Haukeland 2008). Naess & Haukeland (2008, 86), referring to Spinoza, state that the goals of rationalism need to be re-examined and reason should be regarded as an inner compass that "points in a direction that is consistent with the active emotions and in harmony with humankind's nature or essence". Reasoning needs to be enriched with ethical, holistic, intuitive, embod-

[18] Martuzewitch, Lupinacci & Edmundson's (2014) work on ecojustice education provides a cultural ecological analysis and a pedagogy of responsibility with instructions for practice that aims to promote the critical awareness, skills and knowledge needed in achieving diverse, democratic, and sustainable societies in an increasingly globalized world.

[19] Nurmi (2020) provides in her dissertation a profound philosophical argumentation about how images and attitudes are relevant aspects of responsibility as they affect behaviour and future perspectives.

ied and emotional awareness that could provide direct knowing of the vital, sustainable conditions for human existence (Lehtonen, Salonen & Cantell 2018, 353).

Philosopher Mark Johnson[20] (2007; 2017) argues that modern ideals of abstract, objective, generalizable knowledge of Western philosophy have advanced knowing that is distanced from its embodied meaning connections. As a response, sustainability education should emphasize active meaning-making, emotional engagement and experiential knowing (Orr 2004; Wolff 2011; Martusewitcz, Edmundson & Lupinacci 2014; Pulkki, Dahlin & Värri 2016).

Renewal of the human–nature relationship has been regarded as the main issue of environmental education. Alienation[21] as a term has been used in environmental education and especially in environmental psychology to define the problematic human-nature relations. Steven Vogel[22] (2015) suggests using the term embeddedness, not alienation, when defining human nature relations. Besides, as Vogel (2015) points out, environmental education should define the problematic human alienation related to collectively transformed various environments rather than to nature, because in order to engage people it is essential to point to their crucial role in the socially constructed reality of climate change.

Human alienation from the environment is seen as closely related to alienation from one's body (Wolff 2011) or alienation from bodily experiences of connectedness (Pulkki, Dahlin & Värri 2016). In addition, alienation contributes to a sense of meaninglessness and depression (Berardi 2009). In this dissertation, I am interested in the experiences of alienation related to the unsustainability of current lifestyles. I understand alienation as (1) a lack of a sense of connectedness related to embodied self and intuitive faculties, (2) missing understanding of oneself being a part of psychosocial reality and local and (3) global ecosocial relations and as a sense of personal meaninglessness related to climate change and wider interlinked sustainability crises.

The educational response to alienation should focus on the experiences of meaningfulness and a way of living that is interconnected. As philosopher Veli-Matti Värri (2018, 140−141) suggests that in order to save life on Earth, the purpose of education should be to provide embodied experiences of interdependence

[20] Mark Johnson (2007) elevates critical reflection on the role of modern Western philosophy in promoting distanced, objectivist knowing that has become meaningless and refers to Dewey's pragmatist theory as a response.

[21] Alienation is the concept used in study 4 to interpret the lack of sense of connectedness in the performance #Nothing matters. Alienation is a transdisciplinary, descriptive, but vague and imprecise concept commonly used especially in contemporary philosophy, psychology and theology. It has been advocated originally in societal discussions by Karl Marx and in theatre by Bertolt Brecht (1940).

[22] Vogel (2015) refers to Marx and explains alienation as a sense of powerlessness, that we are driven by social structures to behave in unsustainable ways.

with the more-than-human world. Compassion, responsibility to otherness and responsibility to act are essential besides cultivation of hope and trust in life[23]. Embodied experiences of connectedness with nature are essential in elevating "biophilia", meaning affinity or love for all life (Orr 2011, Pulkki, Dahlin & Värri 2016). "What is a good life, goes primarily through emotions" as Naess and Haukeland (2008, 23) write. By reflecting on our bodily experiences, emotions, intuition we can become aware of what is good for us. "Through embodied, sensory experiences we can sense the connection with other people and nature and information and issues become meaningful" Lehtonen et al. (2018) state, referring to Snaza et al. (2014). Moreover, our experience of existence, being alive and our identity are strongly embodied (Naess & Haukeland 2008; Pulkki, Dahlin & Värri 2016).

Understanding and identifying the complex global, local, ecological, political, economic and social dynamics that characterize wicked sustainability issues (Incropera 2016) demands new strategies of learning and thinking. Bruno Latour (1993) has argued for approaching the complex sustainability issues as hybrids that cannot be categorized as physical issues of natural sciences or socially constructed issues, thus studies aiming at understanding these 'hybrid' issues necessitate combining natural, social and discursive studies. Latour (1993) points that these issues should be considered as 'matters of concern', not as 'matters of fact'. Additionally, he suggests that complex 'hybrid' issues demand creating new terms such as natureculture that emphasize interconnectedness, contrary to misleading dichotomous thinking (Latour 1993, 7).

An awareness of interconnectedness, systems thinking and relational understanding have been regarded as essential in sustainability science (Helne & Hirvilammi 2015; Wals 2015; Glasser & Hirch 2016; Nurmi 2020). The term interconnectedness refers to relational ontology. As Dorje (2017, 2) clarifies, even though an awareness of interconnectedness and interdependence are relatively new in scientific and academic discussions, "the idea that all phenomena are interconnected has formed the basis of Buddhist thought and ethics since its outset".

Understanding of interconnectedness has been emphasized in the current Finnish National Curriculum for Basic Education (2014) by introducing for example the ecosocial approach to education[24] that underlines the priority of ecology and the serious consideration of climate change and planetary borders as the basis for sustainable societal wellbeing (Salonen & Konkka 2015). According to ecosocial

[23] These are the conclusions of Värri (2018) in his philosophical exploration of Lacan and Merleau-Ponty related to education in the era of eco crises. Värri frames the challenge of education as hedonistic individualism and overconsumption that is related to capitalism and to hiding the consequences of unsustainability. The latter Värri describes by means of a metaphor, namely how nuclear waste is deposited, or hidden away, in the depths of rock.

[24] The ecosocial approach to education is part of the value-basis of the current Finnish Curriculum (see more in Introduction).

hierarchy, ecological sustainability forms the basis for wellbeing and the economy is regarded as dependent on both ecology and wellbeing (Salonen & Konkka 2015). Hence, social and environmental responsibility are intertwined. Sustainable wellbeing is dependent on planetary realities and the functioning of ecosystems. It has as its background a relational understanding of humanness (Heine & Hirvilammi 2015), seeing man as a part of both global and local ecosocial relations (Lehtonen, Salonen & Cantell 2018).

Arts-based approaches have been regarded as essential in promoting critical awareness and a sense of connectedness[25]. Several arts-based and artistic researchers have emphasized art's role in promoting a critical awareness of modern thinking and its biases (Foster 2012; Heras & Tàbara 2014; Turkki 2020). Arts in general strive to provoke thought, to see the familiar differently. Arts enable looking at the world and its connections from new perspectives (e.g. Ylirisku 2021). According to Italian autonomist philosopher, Franco Berardi (2009), "poetic and conceptual creativity, political creativity ... and friendship are the ways to overcome alienation, enabling the construction of bridges over the absence of meaning". Berardi (2009) suggests positive estrangement, meaning critical self-awareness and distancing, as a 'treatment' for alienation that arts could promote. Moreover, theoretical and philosophical frameworks that dismantle modern thinking and question anthropocentrism and traditional ontologies and related epistemologies, have been much used in artistic research, such as posthumanism (e.g. Aaltonen 2011, 2015; Ylirisku 2021).

2.3 Sustainability competences

Multiple skills, capacities and competences have been regarded as essential in sustainability science, CCE and related fields in order to promote effective climate mitigation and change related to transformations to sustainability. Especially action competence has been regarded as central in climate education (Tolppanen 2015; Tolppanen et al. 2017). Wiek et al. (2011) have brought these capabilities together in a review study and have named key competences, such as systems thinking, and normative, strategic, anticipatory and interpersonal competences. They have also created a model in which these competences are interconnected. However, even if it is valuable to distinguish such essential aspects as sustainability competences, there is a danger of instrumentalism and mechanistic pedagogy if specific skills are not considered relational and from wider aspects of humanness.

Arjen Wals (2015, 11) has defined sustainability competences as relational, contextual and emergent properties that refer "to a way of knowing, doing, being

[25] How drama promotes various dimensions of interconnectedness is explained in section 3.3 on page 23.

and transforming in action that leads to a temporary outcome that is considered the most sustainable given what we know, value and strive for at that moment in time while working on sustainability challenges in a concrete setting". Wals (2015, 11−12) has categorized four interrelated dimensions of relational sustainability competences, namely *learning to know, to critique, to change,* and *to be and care*[26]. According to Wals (2015), people need to have conceptual, systemic knowledge and sustainability literacy and to learn *to know* the dynamics and the content of sustainability and adopt an integral view. They need to learn to think critically and this *critique* should focus on questioning hegemony and routines, and becoming aware of normativity, disruptiveness and transgression. Competence *to change* includes leadership, entrepreneurship and innovation skills, such as unlocking creativity, the utilization of diversity, appreciating chaos and complexity, adaptation, resilience, empowerment, and collective change. Ethical, existential and normative skills, which Wals (2015) describes as learning *to be and care,* involve connecting with people, places and other species, passion, values and meaning-making, and moral positioning, while considering ethics, boundaries and limits.

Arjen Wals (2015, 12) calls for pedagogical consideration, relational competences that necessitate "learning from the experience in a connected way (externally with others, internally with head-heart-hands) that promotes caring for and connecting with people, places and other species". Sustainability education needs to be critical, and to allow critique and questioning. It should promote action and agency and provide open spaces for ethical considerations and moral dilemmas. Moreover, the pedagogy needs to be political: "confrontational and transgressive", disrupting routines, and challenging systems and structures when "deemed appropriate" (Wals 2015, 16).

According to reviews on the potential of performative methods in sustainability science (Heras & Tàbara 2014) and arts in general in CC transformations Galafassi et al. 2017), the arts have been regarded as valuable in promoting all of Wals (2015) relational sustainability competences. The arts offer a non-reductive knowledge that can enlighten the qualitative complexity of sustainability issues (Eernstman & Wals 2013; Galafassi et al. 2017). The arts may promote the creation of meaning for abstract sustainability concepts and reveal contradictory dynamic tensions beyond conceptual models of sustainability. In this way, therefore, questions can be made more relevant and can raise existential issues related to sustainability (Eernstman & Wals 2013). The multimodal experiences of arts can extend affective, personal, social and creative engagement and thus may "help close the gap between what we know and what we actually do about climate

[26] This definition of relational sustainability competences (Wals 2015) was used in study 2 to analyse the potential of drama.

change" (Galafassi et al. 2017, 73). The arts integrate emotions and moral judgement in knowing, as they can provide ethical, affective and aesthetic experiences that affect how humans interpret and assign value (Galafassi et al. 2017). Finally, the arts may open up new horizons, creating novel spaces for reflexivity and experimentation (Galafassi et al. 2017; Wall, Österlind & Fries 2019).

2.4 Futures education

Educational researchers have pointed to the importance of helping students handle the 'wicked' character of sustainability challenges such as uncertainty, ambiguity, and complexity (Wiek, Withycombe & Redman 2011; Lotz-Sistika, Wals, Kronlid & McGarry 2015; Ojala 2017)[27]. Even though the futures perspective is inherent in education for sustainable development and in climate change education, the futures perspective should be more emphasized, as Ojala (2017) argues. Studies evidence that although many young people show an interest in the global future, feelings of helplessness or even hopelessness are quite common (Strife 2012; Threadgold 2012; Nordensvaard 2014; Ojala 2017). Young people are pessimistic concerning the global future (Särkelä & Suoranta 2016; Ojala 2017,) or they have underdeveloped views about it (Torbjörnsson & Molin 2015). If they have positive views, they are mainly based on techno-optimistic visions where new technological innovations will solve the climate problem (Byrne, Ideland, Malmberg & Gracea 2014, Ojala 2017). Therefore, it is justified that a specific focus on anticipatory emotions, especially hope, should be included in ESD (Hicks 2014; Ojala 2012; Stevenson & Peterson 2015; Wals 2015).

The need for hope and active visioning of more sustainable futures has been regarded as acute in the climate change reality of dystopian futures images[28]. According to the Finnish Youth Barometer 2018[29], uncertainty about global issues, such as climate change, global politics and international terrorism, has increased dramatically among Finnish young people over the past decade. Young people worry about the state of the world, but believe in democracy and overall feel more optimistic about the future (Piispa & Myllyniemi 2019).

[27] Anticipatory sustainability competence emphasizes the futures aspect (Wiek, Withycombe & Redman 2011).

[28] Current projects on futures education have recently been conducted in Finland by e.g. Sitra, Tulevaisuuskoulu.fi and Ilmastot@komo.

[29] The Youth Barometer (Piispa & Myllyniemi 2019) is published on an annual basis, measures the values and attitudes of Finns aged 15 to 29 years. The Youth Barometer is carried out each year jointly by the State Youth Council and the Finnish Youth Research Society and it covers issues that are topical for the young. The Youth Barometer 2018 was based on 1,901 telephone interviews and it surveyed young people's views on what kind of opportunities and ways they have to influence society.

Futures education[30] is an essential dimension of climate change education that aims at promoting visions and imagining more sustainable futures. Futures education is a term that was originally used in UK (Hicks 1996; 1997). The main concepts of futures education are *future thinking, future awareness* and *future images* or *visions*. By future thinking one tries to gain knowledge, understand and evaluate information about the future. Future awareness means understanding of what and how one can influence the future (Haapala, 2002, 7−8; Wayman 2009). The basic assumption of futures education is how future thoughts, in which we believe, affect our future (Hicks & Slaughter 1997; Hicks 2014) and the core goal of futures education is to become aware of the preconscious futures assumptions, beliefs and thinking and creation of alternative futures visions (Rubin 2013). Futures education emphasizes proactive attitudes towards the future through active participation and empowerment (Haapala 2002). Futures thinking is based on imagination integrated with facts about the past and current and various future scenarios (Rubin 2013). Therefore, there are no ultimate truths or right answers in futures visioning. Collective visioning enriches futures thinking and reflection on prevailing futures images.

2.5 Psychosocial aspects of climate change education

People need help from supportive communities to cope with climate anxiety and fears about the future (Norgaard 2011). Young people are among the most vulnerable groups concerning eco- and climate anxiety. Research has shown that young people are distressed and worried about climate change (Ojala 2012b; 2017), and they need support in coping with eco-anxiety.

Education should offer supportive spaces for emotional expression and sharing, and teachers have a crucial role in promoting a supportive emotional atmosphere in climate change classes. However, according to research, teachers struggle with the emotional aspect of climate change education (Hermans 2016; Aarnio-Linnanvuori 2018). Pihkala (2019) reflects how teachers' personal challenges of coping with eco-anxiety and various climate emotions hamper their capacity to meet their students' emotional needs and challenges. The challenges of coping with climate-anxiety easily leads to maladaptive coping strategies such as denial and disavowal. Thus, acknowledging these psychosocial challenges is essential in engaging and activating people for climate mitigation and teachers need to improve their emotional reflection and management skills.

Pihkala (2019) has introduced a three-step model for encountering climate emotions and anxiety in education: Firstly, it is essential to acknowledge, name and identify emerging and possible emotional reactions while teaching. Secondly,

[30] Study 3 explores the potential of drama from the perspective of futures education. In Finland recently, the interest and actors in futures education have increased.

discussions on these reactions and various aspects and experiences should be encouraged. Thirdly, the ideal is to offer space for deeper, holistic processes of emotional reflection, expression, sharing and exploring in a supportive and respectful atmosphere.

The social aspect is essential in eco-anxiety, because emotional reactions and coping strategies are socially organized. Our social environment provides us with a normative "general idea of what we can disattend and what we should repress from our consciousness or ignore", that is the "normative dimension of relevance or irrelevance" (Norgaard 2011, 6). "Individual feelings of concern, powerlessness and guilt related to climate change are experienced in the context of social pressure to fit in", Norgaard (2011, 211) explains. Thus, the social context, as Adams (2014, 259) describes it, is "the productive and performative dynamics of social interaction". These dynamics interfere and contribute, "for example, to the understanding of the way human responsibility for ecological degradation is communicated, constructed, distributed and avoided; or how human–nonhuman nature relationships are permitted, rationalized or marginalized in discursive formations that provide parameters for meaningful social life".

Eco-anxiety is the significant part of the cluster of psychosocial impacts of climate change. The term 'psychosocial' emphasizes that understanding these issues necessitates recognizing both intra-psychological factors and social dimensions, such as peer pressure, the cultural politics of emotion, and the dynamics of socially organized denial related to climate change (Adams 2016). The term socially constructed denial or silence exemplifies how social and psychological issues are intertwined (Norgaard 2011). By socially organized denial, Norgaard (2011, 9) describes how "individuals collectively distance themselves from climate change information, because of norms of emotion, conversation and attention". "Ignoring climate change occurs in response to social circumstances and is carried out through the process of social interaction" (Norgaard 2011, 9).

Everybody, students and teachers, and all age groups have experiential knowledge of psychosocial issues that can be used as inspiring material for collective exploration. Hence, collective and creative approaches can empower people and promote hope through bringing people together to create alternative practices and visions for a more sustainable future. Study 4 of this thesis reviews psychosocial issues and aspects of climate change education to show how performance-making can promote performative reflections on these issues. I suggest that participatory arts-based approaches can draw on and cultivate experiential knowing and an awareness of psychosocial themes among the participants. I argue in favour of collective artistic approaches like drama to help cope with eco-anxiety and other psychosocial issues.

3 Drama education

The aim of this dissertation is to explore what kind of understanding and knowing drama can generate related to the goals of climate change education. Therefore, I will firstly only briefly clarify which concepts I have selected to use in this thesis and other related terms. After that, I will focus on the fundamentals of learning in drama and explain in theory how drama promotes interconnectedness as a pedagogical approach. Later, I will review the previous research on drama and performative methods in CCE and refer to the challenges of teaching and applying drama in these fields.

3.1 Drama and drama education, improvisation and performance as key concepts

Drama has multiple meanings in different contexts. It is a specific genre of film and literature, while in the context of theatre, drama refers to characters' perspectives and relations, storyline, narration and textual meaning making, while theatre is more about gestures, affects, rhythm and the corporeality of actors (Lehmann 2016; Viirret 2020, 16).

In education, the definitions and distinctions of theatre and drama were debated especially at the end of the last century. The practitioners and researchers seem to choose their terms depending on their professional identity and context. Theatre professionals obviously call their practice theatre and theatre pedagogy, while educators more often utilize drama when they describe their practice of applying theatrical methods in their teaching. However, the term 'drama' emphasizes the learning through experiences of being and creating the fictive drama worlds while theatre refers to performing and showing typical for theatre arts (see also Bolton 1984; Allern 2008)[31].

I have chosen to use simple terms such as 'drama' and 'drama education' in this research as they are the basic terms used in Finland in my research context. Internationally drama education is seen as synonymous with theatre education, applied theatre and applied drama (Nicholson 2014, 3–7; Viirret 2020, 15), while applied drama and theatre seem to be used more widely than drama. In Finland, drama and drama education are generally utilized in the contexts of teacher education and the national curriculum for comprehensive school (Toivanen 2016, 230). Drama education has been defined in Finland as an umbrella term covering

[31] Widely referred to drama educator Gavin Bolton (1984) distinguishes the intentions of the dramatic playing mode in the drama world as *being* and performing as *showing*.

all the forms of theatre; performing theatre, participatory theatre and applied theatre applied in the school context (Heikkinen 2005, 14–25; Toivanen 2016). I acknowledge that there are many similar terms as drama education that could be utilized in describing this research as these terms have been used for similar research interests such as drama in education or applied drama and applied theatre[32].

Within the Finnish educational context, drama includes all forms of theatre for educational purposes: performing theatre, participatory theatre, and applied theatre in use in the learning environment (Toivanen 2016, 174). This division of theatre genres used in Finland, is based on varying roles of participants and spectators. In performing theatre (e.g. school theatre) the roles of performers and spectators are traditionally clearly distinctive (Toivanen 2016). In applied theatre (e.g. forum theatre) the audience is asked to get involved in the performance, whereas in participatory theatre (e.g. classroom drama, process drama) there is no segregated audience as the difference between performers and the audience is partly or completely obliterated (Toivanen 2016, 230). This dissertation focuses mainly on performing theatre, especially in devising theatre that means creating a play from the themes and perspectives brought up by participants) and theatre improvisation (especially studies 3 and 4). Compared with process drama that is a form of participatory theatre, one of the best known and much investigated genres of theatre and drama (Viirret 2020).

As drama is used here to promote essential skills and understanding for climate change education, this dissertation continues the Finnish research interest of applying drama in multiple contexts (Østern 2015; Østern, Viirret & Toivanen 2017)[33]. This interest of applying drama in teaching climate change education or other subjects is in line with the status of drama in the current Finnish national curriculum for basic education, where drama is proposed as a teaching method for many other subjects (e.g., history, language subjects) besides its essential status in Mother Tongue and Finnish (Toivanen 2016).

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[32] Applied drama and theatre emphasize the multiplicity of contexts where drama can be applied for emancipatory societal, political and cultural interests (Krøgholt 2010; Nicholson 2014, 5). This research could be categorized as applied drama or theatre, as I explore the potential of drama for the specific purpose for climate change education, which is a societal, political and cultural issue. However, I only refer to the literature of applied drama and applied theatre. By operating with the simple terms of drama and drama education, I hope to avoid promoting the prevailing melange and confusive discussion on terms, their definitions and distinctions in the field of drama and its research (see more Schonmann 2005).

[33] According to a meta study (Østern 2015) that identified the knowledge contribution of 42 Finnish doctoral theses of drama conducted during the last 10 years, Finnish research in drama education has focused on: 1) Articulating forms of learning, 2) Knowledge production – the performative turn, 3) Applying concepts from theatre/drama to new sites, 4) Equity agenda, participation, collaboration, 5) Not art for art's sake but art for a more human society, art for cultural development, art for cultural literacy, and for subject formation.

Creating roles and fictive worlds of drama is generally actualized through embodied imagination, improvisation, storytelling and performing. I refer to Frost and Yarrow's (1990, 1) definition of improvisation in the context of theatre as "the skill of using bodies, space, all human resources, to generate a coherent physical expression of an idea, a situation, a character (even, perhaps a text); to do this spontaneously, in response to the immediate stimuli of one's environment, and to do it *a l'improviste*: as though taken by surprise, without preconceptions". 'Performance' and 'performative' are used in several meanings and contexts in this thesis. Performing or performance may mean a process of making a theatrical performance for an audience as research, but also as a way to describe the embodied performative and performed dialogue and the embodied improvisation and reflection.

I understand the terms performance and theatre, likewise theatre and drama, as interwoven, not as fixed or stable categories, but as 'sites of experimentation that are continually in play', as Govan, Nicholson and Normington (2007, 9) conclude their reflection on the distinction between theatre and performance[34].

3.2 Learning in drama

As the etymology of the word 'drama' describes, drama is action − embodied and dialogical imagination and meaning-making. Participants take part actively in the collective creation of fictive worlds of drama through playing seriously: through imagination, improvisation, storytelling and making performances.

At the core of making drama is role taking, imagining being someone else, acting in the fictive world and reflection on fictive perspectives (Toivanen 2016). 'Aesthetic doubling' is a term that is used for describing how the participants in drama can compare the actual with the fictional imaginary "as if" world (Heikkinen 2002; 2016). The process of creating fictional worlds together demands active participation and an attitude of serious playfulness (Heikkinen 2002). Through serious playfulness, participants devote themselves to the rules of the play within the fictive frame in order to create new meaning. Serious playfulness gives the drive and aesthetic doubling creates the frame for identification, distancing and reflection, meaning-making and interpretation (Heikkinen 2002, 149).

Toivanen (2016) describes aesthetic doubling as a kind of problem solving through role taking. Role taking allows trying out different roles and releasing

[34] Govan, Nicholson and Normington (2007, 8) distinguish the following terms: 'Performance is generally seen to be wider and more eclectic in scope, extending not only to theatrical performances that take place in and outside theatre buildings, but also to performative aspects of everyday life." Whereas "theatre is associated with artificiality and showiness and consequently remote from the more pressing concerns of daily existence." Nevertheless, the essence of theatre is in the "duality of gaze", namely recognizing the gap between reality and fiction (Govan, Nicholson & Normington (2007, 8) write.

from the normal social roles, thus exploring issues from different human perspectives and promoting empathy. Besides, role taking enables narrative distancing. Acting in a drama role enables trying out safely and experiencing how it might feel to speak and act like someone else (Toivanen 2016) and thus allows distancing − encountering emotionally challenging issues, contradictions and tensions in the fictive drama world. In essence, the fictive and narrative elements of drama enable both (1) identification or recognition of something within us, through empathic stepping into the role character's shoes and (2) distancing, remaining distanced from the events being dramatized (Gallagher 2005). In addition, acting and creation of the fictive drama worlds enable practising problem solving in an imaginary reality that is not constrained by reality. However, facts are often used for constructing the context for collective imagination.

Learning in drama is based on experiences and their reflection. Experiential, aesthetic learning evolves in drama through experiences of creation and action in fiction and reflection on these experiences (Teerijoki 2001; Østern 2006). Personal experiences become reflected and related to other participants' perspectives and to the collective understanding that emerges during the drama practice among the group of participants. In essence, participants' experiences and reflections become integrated and transformed into the collective creative process (Sava 1993; Teerijoki 2001; Østern 2006). Hence, participants in drama take part in both producing and creating knowledge collectively and as receivers (Wright & Rasmussen 2001, 221). Dramaturgy is an essential element that structures the focus, frames the content of collective creation and creates the dynamics of narrative knowing in drama (Østern 2006; 2019; Allern 2008).

Embodiment is a central character for learning in drama. Embodiment strengthens holistic experiences of presence, imagination and empathy. The intensified embodied awareness that drama promotes, fosters holistic intercorporeal dialogue and mutual connectedness with one self, others and the world. Embodied practices foster sensitive presence, intercorporeal dialogues and strengthen a sense of intersubjectivity among the participants. In Buberian terms (Viirret 2018), holistic intercorporeal dialogue and mutual connectedness promote a living, non-objectifying 'I-Thou' relationship with the issues contrary to objectifying I-It relations[35]. However, it is artificial to separate embodiment as an unattached aspect in the holistic integrated, comprehensive, relational process of learning in drama (Perry & Medina 2015).

[35] The attitude of I-It regards, It as an object that is separate in itself, which we either use or experience. Whereas the attitude I-Thou is a relationship in which the other is not separated by discrete bounds.

3.3 Drama as an interconnecting approach

This study explores drama as an interconnecting approach for climate change education. I have chosen to use the term 'approach', because I argue in favour of drama as a holistic, complementary approach that promotes ecological relational knowing and learning, contrary to the instrumental use or understanding of drama simply as a means or a method for climate change education.

Interconnectedness is a central aspect in sustainability[36]. The interconnectedness that I expect drama to promote, covers various dimensions. Firstly, drama as experiential and reflective learning elevates participants' connectedness with their inner being, emotional and creative resources, and personal embodied memories and experiences. Embodied practices enhance intercorporeal dialogue and a sense of connectedness in drama (Viirret 2018; 2020).

Secondly, drama is a socially interconnecting and dialogical approach that fosters mutual connectedness among the participants and with the world and its issues explored through drama (Wright & Rasmussen 2001; Viirret 2018). Embodied mutual connectedness becomes fostered when personal experiences and reflections become compared and related with other participants' reflections. In addition, stepping into another's shoes through role taking stimulates an empathic understanding of others' perspectives that also promotes social connectedness. By nurturing active personal meaning making of the issues explored through drama (e.g. Wright & Rasmussen 2001; Østern 2006), drama also connects with social reality.

Thirdly, drama can promote a relational understanding of the world (relational ontology) and a relational way of knowing (relational epistemology). Drama can manifest how we actively construct and are shaped by our social worlds (Rasmussen 2014, see also Nicholson 2016). Drama has been regarded as a relational pedagogy, for example, by Aitken, Fraser and Price (2007) and Prentki and Stinson (2016), as it promotes a sense of interdependence among the participants (Neelands 2009) and interconnects students' experiences and perspectives (Prentki & Stinson 2016). The following quote by Prentki and Stinson (2016, 5) summarizes how drama as a relational pedagogy "involves creating alternative presents and futures through processes of shared enactment, discovery and collaborative imagining".

Students in drama participate in experiential storying framed by questions and issues of significance. The stories are co-constructed relationally with and between all partici-

[36] The significance of interconnectedness is explained in the first study/ article and in sections 2.2. and 6.1.

pants, their teacher, the content of significance and the social, cultural, familial and economic contexts the students inhabit. This interdependence of the participants, teacher and students, content and context are essential to the creation of meaning. The web of relationships continues beyond the experiential moment and translates into new ways of knowing and being in the world outside the classroom or workshop space.

3.4 Drama for climate change education

According to several researchers, artists and drama practitioners, applied theatre and drama can make a particular contribution in sustainability education, environmental education and in social transformations to sustainability. According to a comprehensive review on performative methods in sustainability science (Heras & Tàbara 2014, 391−392), the special value of these methods is the way they invite and engage participants "to switch into an explorative mood and a dialectical way of reasoning and being" that can promote "critical awareness of social dynamics, and of the role of emotions, beliefs, and aesthetics in our understanding of sustainability issues". Drama seems to have value both in enhancing factual learning of sustainability issues, deepening understanding of complexity and in promoting skills of action and active citizenship (Alaba & Tayo 2014; Heras & Tàbara 2014; McNaughton 2004; 2006; 2010; 2014). In this section I review and summarize conclusions of other studies on using drama for wider sustainability education and for CCE.

Learning in the fictive, imaginary contexts of drama promotes seeing differently, alternative ways and adopting a systemic, holistic and relational understanding of the world (Heras & Tàbara 2014). Multiple human, local and global perspectives of sustainability issues can be enlightened through role-play and deliberative discussion during drama (Alaba & Tayo 2014; McNaughton 2004; 2006; 2010; 2014). Multivocal dialogue through performative methods, for example, in the role of different stakeholders can support empathy, social reflexivity and cultural renewal (Heras & Tàbara 2014). Particularly the dialogical reflection (in role) enables practising action, decision-making, communication and various global citizenship skills (McNaughton 2004; 2006; 2010; 2014). In addition, drama enables integrating challenging emotional aspects of sustainability education in learning (Österlind 2012).

As an embodied and narrative approach, drama makes it possible to encounter and explore emotional aspects of climate change in a specific way[37]. Drama enables addressing emotionally challenging issues through narrative distancing and creating a safe space for creative, embodied exploration, expression and sharing of various modes of eco-anxiety (Lehtonen & Pihkala 2021). Embodied practices can release eco-anxiety and make visible participants' emotional experiences that are "beyond text" and are not easy to talk about (Lehtonen & Pihkala 2021; Turkki 2020). Moreover, as a collective, participatory approach, drama can foster a sense of belonging and elevate new perspectives to the meaning of community (Mathewman, Mullen & Patuwai 2015) and promote resilience and coping with uncertainty among vulnerable communities (Brown, Eernstman, Huke & Reding 2017; Heddon & Mackey 2012).

Several authors have noted that drama can promote a sense of connectedness between the participants, with issues explored, with non-human agents, natural environments and the planet (Forgasz 2012; Davis & Tarrant 2014; Heras & Tàbara 2014; Aaltonen 2015; Wall, Österlind & Fries 2019). As Forgasz (2012, 325) states, drama can promote personal connectedness, empathy and caring attitudes towards our globe and non-human creatures "by encouraging personal, participatory, embodied and emotional engagement" (Forgasz 2012, 325). Likewise, Aaltonen (2011; 2015) has developed drama, storytelling and applied theatre practices to explore how drama can promote a sense of connectedness with other life forms and non-human actants like whales. According to a study by Davis and Tarrant (2014), the sense of connectedness with natural environments became strengthened especially when science-based, fictional, and experiential approaches were combined.

To summarize, performative methods of drama seem to have value for sustainability science and CCE by providing an alternative, arts-based approach for creating engaging spaces for imagination, creativity and playfulness that can promote both 1) social, critical awareness and 2) "utopian performative visioning" of more sustainable futures and societies through role-visioning and rehearsals for action (Heras & Tàbara 2014). However, the skills learned and understanding gained are very much dependent on the context, the practices chosen, the skills of the facilitators and the willingness of the participants to engage themselves in collective creative action, as drama work demands attitudes of serious playfulness.

Methodologically, the studies of the potential of drama, performative methods or applied theatre for CCE or transformations to sustainability referred to in this

[37] This has been a specific focus of artistic and arts-based research in Finland, artistic researcher Anu Koskinen (2015) has embodied personal reflections of ecological crises on stage in dialogue with Foucault's theory of technologies of self. Nella Turkki (2020) has explored climate emotions through dance with heterogeneous groups, and Lehtonen & Pihkala (2021) have conducted embodied drama workshops "From eco-anxiety to hope" for environmental activists.

chapter are either reviews (Heras & Tàbara 2014; Wall, Österlind & Fries 2019), arts-based case studies that explain artistic processes through examples of practice of singular workshops (Aaltonen 2011; 2015; Matthewman, Mullen & Patuwai 2015; Brown, Eernstman, Huke & Reding 2017), wider studies with several cases of various practices combining qualitative interviews (Galafassi, Tàbara & Heras 2018), or questionnaires as assessment (Heras, Tabara, & Meza 2016). The studies referred to in this section have used various methods of drama or applied theatre and define their practice as process drama and storyline (McNaughton 2004; 2006; 2010; 2014), devising performance (Heddon & Mackey 2012), community theatre (e.g. Brown, Eernstman, Huke & Reding 2017), or Boal's image theatre/ theatre of the oppressed (e.g. Brossmann & Islar 2019).

There are specific ethical issues, limitations and challenges of defining criteria of assessment in transdisciplinary, performative research, as Heras and Tàbara (2014, 394) have noted. According to several writers, applying the performative and participatory methods of drama in CCE raises specific ethical issues related to ownership and power issues (Nicholson 2014; Lehtonen 2015; Ahmed 2016). In drama, it is always essential to reflect and acknowledge the purpose and intent of practice and whose ideas become strengthened through drama and applied theatre (Nicholson 2014; Ahmed 2016). Especially, when using and designing drama as a pedagogical and research practice for addressing global and emotionally sensitive sustainability issues, the emotional issues (Österlind 2012) and power issues related, for example, to post-colonialism (Mathewman, Mullen & Patuwai 2015) and neoliberalism (Ahmed 2016) need to be recognized and critically considered. Besides, the question of assessing the impact of performative or arts-based methods in transdisciplinary sustainability science seems to be a current issue of discussion within the field (Heras & Tàbara 2014; Ruiz-Mallén, Gallois & Heras 2018).

3.5 Challenges and skills of conducting drama

Applying performative methods of drama require specific facilitation skills. The effectiveness of these approaches is highly variable and depends on the quality and frame of practice, in the "audience members' receptivity and background" (Heras & Tàbara 2014).

According to research, drama does not often reach the ideal levels of the dialogue and serious playful creation of fiction. The roles and norms of the behaviour of the drama class differ from normal school[38]. Especially devising theatre, as Mia Perry (2011, 71) writes, "is at odds with much of the underlying foundations of the school system as it does not encourage consensus of interpretation or cohesion

[38]The specific challenges of teaching drama have been a special research interest at the University of Helsinki (for more, see Toivanen 2016).

of behavior". According to Nicholson (2014, 59), "working in drama requires a change in institutional culture, a shift in thinking from the idea that a professional controls the situation because of their expert disciplinary knowledge, to recognising that participants have specialized knowledge of their own situations and experiences which are central to the work". Discussion on the rules and expectations through negotiation of a drama contract helps to clarify the rules and encounter these issues (Viirret 2020). In successful (process) drama, the participants have a shared understanding of the context and the goal of making drama (Viirret 2020).

Conducting drama demands specific resources. Especially making artistic performances is time-consuming (Luton 2017). While less intense approaches, like single workshops, are able to reach larger audiences in a shorter space of time, their impact and individual meaning may remain limited or superficial (Heras & Tàbara 2014, 393−394). Longer-lasting processes produce experiences that are more meaningful for the participants and provide deeper insights into the issues explored through drama.

According to research by Toivanen, Mikkola & Ruismäki (2012), teaching drama necessitates paying attention to interaction and group dynamics, as in the "empty space of drama" traditional ways of controlling students are not possible. Therefore, drama teachers need to recognize group dynamics, and aim to fractionate the dynamics and normal social roles within the group (Toivanen, Pyykkö & Ruismäki 2011; Toivanen & Pyykkö 2012). Improvisation skills of spontaneity, presence, accepting ideas, tolerating mistakes and focus on student perspectives are essential in successful drama teaching that promotes students' creativity (Lehtonen, Kaasinen, Karjalainen-Väkevä & Toivanen 2016). Besides, participatory teaching in drama necessitates giving the ownership of the project to the students themselves (Lehtonen 2013; 2015).

Drama teachers need to create a space for students' action, views and ideas, increase respect, tolerate ambiguity and promote mutual trust among the group (Lehtonen et al. 2016). As drama is ethical dialogue (Heikkinen 2016), teachers need to listen carefully and recognize evolving ethical issues. Nicholson (2014, 162) describes the ethical dimension of applied theatre through the metaphor of gift giving. It is relevant to question whose interests and needs drama serves, if it is of the facilitator or the participants. Sensitivity is also needed to protect the vulnerability of the participants and listen to their willingness and readiness to share or not share their personal thoughts and issues. Drama can provide a fictive shelter for personal exploration. Even then the teacher needs to take care that the participants are willing to take roles through drama contract (see Viirret 2020: facework). Moreover, drama teachers need to acknowledge and be sensitive to whether participants get the roles, challenges and experiences that they are ready to encounter (Gallagher & Sallis 2019).

Ethical sensitivity and consideration are especially needed when implementing drama for CCE, due to the need of psychological coping with eco-anxiety and

related psychosocial issues. Climate change and the pressure to change often evoke maladaptive coping, such as denial, disavowal, blaming others, splitting and stereotypical thinking. Therefore, the focus of reflection should be on the self and on personal experiences in order to avoid normativity or stereotypical thinking (Gallagher 2001). Openness, bearing and respecting ambiguity are particularly essential. Likewise, Nicholson (2014, 37) encourages critical questioning whether theatre "is used to promote simple message formation rather than encouraging an open debate." Drama facilitators need to become familiar with the substance and be aware of their own emotions, relations and attitudes with the topic in order to avoid unintentionally transferring emotions or attitudes while facilitating drama (Österlind 2012). As ethical praxis[39], drama should strive for ethical and polyphonic dialogue that respects multiple experiences as well as contradictory perspectives on issues.

[39] By using the term praxis I refer to the processes by which ideas, theories, lessons, or skills are enacted, embodied or realized.

4 Arts-based and practice-led research

In this thesis, drama is used as an arts-based research approach to explore the potential of drama in CCE. In this dissertation, drama is both the object and the method of the study. Drama is used for generating reflective, performative inquiry to explore 1) the potential of drama as an interconnecting approach for sustainability education (Study 2), young students' futures thinking (Study 3) and young performance workshop participants' perspectives on climate change (Study 4).

In this section I explain how knowing in drama evolves as a performative, arts-based and practice-led research approach. Thus, I present the methodological background for the whole dissertation and especially for studies 2–4. I refer to the definition of arts-based research by Leavy (2009; 2017). I also explain the specific methodological characteristics of drama as practice-based research and introduce the "extended epistemology" of practice-led research and the various modes of knowing that practice-led research generates (Heron & Reason 1997; Haseman 2006; Rasmussen 2014). I then introduce translation mechanics of arts-based research (Gerber & Myers-Coffman 2017) and relate it with Østern's (2006) and Sava' s (1993) theoretical explanation of the aesthetic transformative learning process in drama. These models together with performative inquiry (e.g. Fels 2011) explain in theory how knowing and new insights emerge in arts-based processes of drama.

4.1 Drama as arts-based, practice-led research and various ways of knowing

Arts-based research (ABR) is generally defined as a transdisciplinary approach to knowledge building that applies creative arts in different phases and contexts of research (Leavy 2009; 2015; McNiff 2014). Typically for ABR, specific forms of arts are used both in generating, presenting and disseminating the knowing evolved[40]. ABR has been categorized both as a type of qualitative research in social science (Coemans & Hannes 2017) and as a distinct research methodology (Leavy 2015). ABR is an integrative, holistic approach that "expands on existing disciplines and synergies" and may draw on any art form (Leavy 2017, 5). Arts-based research generates knowing that integrates sensual, embodied/kinesthetic,

[40] The terminology of using arts in or as research varies. Distinctive for ABR is using arts in research and a focus on creating relevant understanding of the topic of inquiry, while artistic research is typically conducted by educated professional artists/artistic researchers and the whole process of creating art (as the main focus) is considered as artistic research (e.g. Suominen, Kallio-Tavin & Hernández-Hernández 2017; Ylirisku 2021).

imaginary and cognitive understanding and represents it through arts, symbolic and performative language" (Gerber & Myers-Coffman 2017, 592; Leavy 2017, 5).

Knowing in drama unfolds from experiences of participation and it involves active meaning-making (Østern 2006). Knowing evolves during the process of collective creation and reflection on these experiences (Rasmussen 2014, 29). Context, situation and its interactions engender evolving understanding and the meaning making of drama. Thus, drama posits a relational epistemology (Rasmussen 2014) that emphasizes interactions and relations as the basis of knowing. "We exist and develop knowledge only through relations", Rasmussen (2014, 26) writes, quoting to Heron and Reason's (1997) explanation of extended epistemology, ecological and interactive ontology. In drama, knowing evolves in dialogue and interaction within the participants and between participants and the facilitator. Knowing is situational, collectively constructed in dialogue but driven by individual interests[41].

The inquiry process of drama is "practice-led", as "the reality is changed by interaction with or intervention in reality" as Rasmussen (2014, 24) explains. Practice-led research epistemology "rejects the split of subject and object" and emphasizes active participation in the creation of culture and an understanding of the world (Rasmussen 2008; 2014, 25). Rasmussen (2014, 25 quoting Heron & Reason 1997) further explains the intertwinement of the personal and the collective in the following way: in drama, "shared and common knowledge is created by a subjective self-reflexivity and by an intersubjective meaning construction".

Drama as practice-led research relies on an extended epistemological paradigm and emphasizes a participative worldview. In practice-led research, according to Heron and Reason (1997, 278), "a knower participates in the known, articulates a world, in at least four interdependent ways: experiential, presentational, propositional and practical". *Experiential* knowing emerges in "direct encounters with a phenomenon, where one experiences the presence of the other through body, emotions and imagination". *Propositional* knowing is "a search for knowledge through conceptual statements or description and analysis, expressed in thesis and theory; it is the processing of experience mainly through thought, speech and writing". This conceptual/ propositional knowledge dominates science and education. *Practical* knowing or so-called 'tacit knowing' characterizes bodily skills and competences "demonstrated in a range of life activities from riding a bike to making art", whereas *presentational* knowing presents experiential knowing in symbolic and linguistic forms that are typical for arts (Rasmussen 2014, 26). These four different kinds of knowing, typified by Heron and Reason (1997), are all pre-

[41] Rasmussen (2010, 2014) refers to social constructionism, a much used philosophical principle in drama, and explains drama as *constructivist aesthetics* by compounding Dewey's (1934/1958) theories of experiential and aesthetic learning.

sent and integrated in this thesis. I use the term 'conceptual' instead of 'propositional', and 'performative' or 'performed' rather than 'presentational' knowing, as I regard these terms as more functional and suitable for drama as performative art and research.

4.2 Drama as performative research and inquiry

The interest in applying creative methods of drama and theatre e.g. playwriting and performance in research of different fields has increased during recent decades (e.g. Norris 2000; 2009; Belliveau & Lea 2011; Sajnani, Sallis & Salvatore 2018; Østern 2019). While the use of performative methods of theatre and drama in research have been expanding, the definitions and terminology have become blurred (Sajnani, Sallis & Salvatore 2018)[42]. The use of specific terms in performative research "depends largely on the practitioner's context and/or self-ascribed vocational identity" as Sajnani, Sallis and Salvatore (2018, 80–81) point out.

I have chosen to define my methodology as arts-based, practice-led research and performative inquiry as I find these terms to be most descriptive for my practice. In addition, I use the terms improvisation, devising theatre and performance making as I do not consider the short workshops of study 4 to be really theatre events or research-based theatre and as I am not a theatre professional.

Performative inquiry[43] is one essential descriptive term that explains how creating knowledge in drama occurs through practice (Østern 2019). I have chosen

[42] There are differences of opinion about how to distinguish one term from another, such as ethnodrama, ethnotheatre, ethnographic performance, performed research, theatrical research, documentary theatre, research-based theatre, etc. Ethnodrama and ethnotheatre have been defined as theatrical modes of disseminating research data gathered and analysed using traditional qualitative research tools, such as action research, narrative, interviews, and field notes (Mienczakowski & Moore 2008; Saldaña 2008; Belliveau & Lea 2011). Playbuilding and research-based theatre, on the other hand, have been defined as using theatrical methods through all stages of the research process (Norris 2009; Belliveau & Lea 2011).

[43] The term performative inquiry has been used in a wider sense of various performative approaches, e.g. dance in qualitative, arts-based research. As Butler-Kisber (2018, 163) writes, performance can offer a metaphor for all that is done in qualitative inquiry, both in the doing of the research and in the representation, whether the product is a written text, story or poem, or a collage, photograph or film, or any other form. It offers an important lens for thinking about inquiry that is embodied, relational, participatory, and geared to action and social change. Lynn Fels (1999) has introduced the notion of performative inquiry into drama education research. Performative inquiry has also been referred to many performative fields according to Fels (2015), such as ethnographic performance text, performance ethnography, documentary theatre, docudrama, nonfiction playwriting, theatre of reenactment (referring to Saldana, 2008: 283), reality theatre, performed ethnography, performance science, research-based theatre, applied theatre, data-based readers theatre (referring to Donmoyer & Yennie-Donmoyer, 2008), and popular theatre (Fels 2015 referring to Conrod, 2009).

to use this term in this dissertation, because performative inquiry complements the theoretical understanding of the cyclic process of knowing that the theories presented in the last section offered. Performative inquiry explains and enlightens how a topic or issue is explored in the dynamic process of creative action and in exploration through performing (Fels & McGiven 2002, 27).

Performative inquiry is "an umbrella concept" that covers different forms of drama and theatre used in educational and social science" and underlines how knowing in drama emerges in the performative mode, when "the performer embodies and in words presents a perspective, an insight or a provocation in a performance" (Lichtblau 2009, 256). By definition, performative inquiry is creative action and interaction, critical thought and reflection. Performative inquiry is "an action-space of learning and exploration" (Fels 2011), that enables momentary entrances into other worlds of possible responses embodied in performative play and reflection (Fels & McGiven 2002, 32).

Fels (2011, 342) writes that the starting point for the performative inquiry can be "a question, an argument, a theme, an issue, any phenomenon brought up by the participants that is explored through performative engagement". As evocative methods for research, drama or theatre can provoke raw questions, responses and emotions for research purposes. The tools of drama as performative inquiry are "our bodies, our minds, our imaginations, our experiences, our feelings, our memories, our stories, our biases, our judgements and prejudgements, our hopes and our desires, our curiosities and our questions – simply, our very being, becoming" Fels (2011, 342). Thus, the triangulation process required in qualitative research is already built into performative inquiry of drama that as a collaborative, multimodal approach integrates multiple ways of knowing Norris (2009) argues.

Performative inquiry as a descriptive term describes the open-ended, situational, even chaotic nature, of the processes of the "becoming" of drama as research or exploration. Becoming refers to an ontological assumption and understanding of reality as a dynamic process as transformative, continuously changing, not producing fixed entities such as being, subject, object or thing. Likewise Barad (2007, 148) writes: "humans are neither pure cause nor pure effect but part of the world in its open-ended becoming".

Lynn Fels (2011, 339) argues that the etymological reflection of per/form/ance provides interesting and relevant insights of the complex, holistic, open, chaotic and creative nature of performative inquiry. The prefix 'per', may mean both "utterly, throughout and through" form or a deconstruction of form. Drawing upon Heidegger's understanding of knowledge as an active engagement simultaneously embodying knowing, doing, being and creating and double meaning of prefix *per* Fels (2011, 340) explains, how "per/form/ance may be read as simultaneously through form and through destruction of form, we come to action ie. knowing, doing, being and creating. Thus, "the double meaning of performance describes the nature of drama operating on the edge of chaos of open inquiry" (Fels 2011,

340). This edge of chaos needs to be turned into a potential space that may enable an open-ended, co-emerging and creative performative inquiry that when combined with reflection may "bring forth new possible learning" (Fels 2011, 340). However, the chaotic, open-ended process of becoming typical for performative inquiry makes conducting drama challenging, requiring balancing with structures and freedom. It demands "being mindfully aware of the interplay of relationships, structures, practices, implications … and interaction..." as Fels notes (2011, 340).

4.3 Translation mechanics and aesthetic transformative learning: How does knowing evolve in ABR and drama?

Translation is the term used in ABR to explain and structure the artful processes of how new insights evolve in the 'messy' practice of arts-based and transdisciplinary research. I refer to Gerber and Myers-Coffman's (2017) theory of translation mechanics to explain how arts-based knowing in drama unfolds in a cyclic process that intertwines personal reflection in collective dialogues. According to Gerber and Myers-Coffman (2017), the ABR translation process typically consists of three phases: (1) An initial, formative phase of reflection that connects with embedded personal, disciplinary and cultural philosophical assumptions, beliefs and values through free associative practices; (2) Immersive artful and reflective dialogues that generate multiple, ambiguous perspectives; (3) Syntheses are artistic elaborations that are based on the previous cumulative insights, presented either in an artistic way by e.g. performing, narration or poetry; or by verbal or written reflection. (Gerber & Myers-Coffman 2017, 599.) The dialogues and syntheses that drama generates are typically performative, based on embodied imagination and improvisation.

The various phases of *translation mechanics by* Gerber and Myers-Coffman (2017) seem to fit and be built into my studies, even though the phases are partly overlapping. I think that together with the theory of *aesthetic transformative learning process* (Sava 1993; Teerijoki 2001; Østern 2006), the *translation mechanics* (Gerber & Myers-Coffman 2017) offer a clarifying framework for the process of knowing for drama as arts-based, practice-led research.

The theory of *aesthetic transformative learning process*[44] (Sava 1993; Teerijoki 2001; Østern 2006) has been much used especially in Finland within drama education and it entails similar phases as the mechanics of translation (Gerber & Myers-Coffman 2017). This theory explains the process of how participants' lifeworlds become transformed into artistic, dramatic action in active meaning-making (Sava 1993; Teerijoki 2001; Østern 2006).

44 The aesthetic transformative learning process was the theoretical framework behind the design of the learning process of the futures improvisation and devised theatre project of study 3.

According to Østern (2006), the aesthetic transformative learning process (1) "starts with some immediate sensuous experiences (memories, materials, emotional experiences)" (2) that become transformed by individual and group reflection and (3) are artistically elaborated "by forming concepts metaphorically in the art form and by forming concepts theoretically" through reflection. "The process leads to increased knowledge about and change in one's relationship to oneself, other people, nature or society" that might "lead to new artistic learning processes."

According to both theories (Østern 2006; Gerber & Myers-Coffman 2017), the arts-based knowing process starts from personal experiences of becoming personally and holistically connected with the theme, which becomes enriched with reflection and dialogue, and elaborated during the artistic action of e.g. improvisation and performing into performative syntheses. The artful inquiry process is cyclic, the first elaboration and a synthesis may be followed by new experiences, such as reflective dialogues that generate further performative and/or conceptual syntheses.

Through reflective dialogue and making performative syntheses and conceptual artistic elaboration, participants reflect and select what is essential in their experience and thinking. Thus, in performative, practice-led research the "process of expression ... becomes the research itself" (Haseman 2006, 6). During the phase of reflection, participants interpret the meaning of the performative syntheses they created during drama, whereas the researcher's role is to facilitate and capture this process.

In arts-based research processes, the researcher aims to capture the cycles of becoming and elaboration through reflection-on-action and through creating further reflective and conceptual syntheses afterwards. Through dissemination, the researcher aims to make visible the whole process of performative inquiry and makes further syntheses of the participants' syntheses. Nevertheless, the different phases of the performative research: performative exploration, dialogues, creating syntheses, analyses and interpretation, are linked and overlapping.

4.4 Reflective practice and various roles in performative research

As practice-led research and performative inquiry are very much dependent on the researcher, his/her facilitation skills and relations with and within the participants, reflective practice is essential. The researcher needs to tolerate open-endedness and uncertainty and step into uncomfortable zones. During my experimentations, I experienced most uncertainty about how my personal attitudes, interests and emotional responses that were partly unconscious had an impact on the participants' experiences and the knowing generated during the praxis. I was worried if

I had made "the right choices" while facilitating improvisation and devising processes, and if participants' voices were equally respected, integrated and presented. Like Belliveau (2014, 126) I had to navigate, balance, and reflect on the arts-based research processes, "with vulnerabilities, expectations, and various commitments related to the different identities" and their perspectives. Especially during study 3, my first experimentation, I found reflective practice and video recording to be helpful in offering extra eyes to distance myself from my practice.

Reflective practice according to Schön's (1983; 1987) theory, becomes realized through three phases (Schön 1987; Larrivee 2000; Dawson & Kelin, 2014, p. 29). (1) *Knowing in action* is practical knowing that together with the pedagogical ideas and research goals guide the realization of the practice. (2) *Reflection-in-action* is the awareness and experiential knowing of what is happening "in-the-moment of practice". The whole reflection process includes considering ethical aspects of practice and how power-issues become encountered (3) *Reflection-on-action* is the post-reflective process that deepens experiential knowing and develops practical knowing. Reflection-on-action is about recalling, analysing and interpreting the experienced happenings and evolving performative knowing and their meaning. Schön's theory of reflective practice has been applied and developed further in arts education, ABR and in many other fields.

When writing on drama as research, Nicholson (2019) has distinguished the following three voices of reflective practice: (1) The creative practitioner-researcher voice recalls and aims to describe the practice as experienced and thus explains, how the performative knowing was generated (cf. experienced and practical knowing by Heron & Reason 1997). (2) The analytical voice of the researcher aims at deepening a conceptual understanding of practice. (3) The reflective voice aims at bringing the creative and analytical together through dialogue within theory and practice in order to deepen the understanding and interpretation of the praxis and knowing generated.

Thus, drama as arts-based, practice-led research necessitates looking at the research process from different perspectives and demands taking various roles. Therefore, practice-led researchers need to acknowledge the various positions and values and preferences behind the research design in performative research (Østern & Knudsen 2019). In the context of research-based theatre, Belliveau and Sinclair (2019, 10) have distinguished the following roles in drama research: maker/facilitator, writer/dramaturg, performer, outside eye of researcher.

During my studies I found I had to balance between my responsibilities and interests as a pedagogue, researcher and the artists' roles and their interests. As a teacher, the participants' learning experiences were naturally my main responsibility and interest. As a researcher, I was concerned primarily with the conditions

of producing data and the quality of the knowledge generated. Although the various identities and interests were interconnected and present simultaneously, I experienced that the research interest was often the dominant one.

The primary identity also varied in each study of this thesis. In study 1, I identified myself almost solely as a researcher of climate change education. In study 2, I identified myself mainly as a researcher-educator of climate change education interested in the potential of drama in CCE In study 2, the research interest, the research-based practice (Haseman 2006), framed the design of the DESF course. During study 3 my role was a combination of primary school teacher, environmental educator interested in futures education and a student of drama education, while in study 4 my main role was as a climate change educator, a researcher and as a workshop facilitator. During study 3 group dynamics and power issues were one relevant focus of reflective practice, as I as the teacher struggled with managing group dynamics and power issues that often evolve in a school context when the participants are not that familiar with working with drama at school.

4.5 ABR methods used in studies 2−4

In arts-based research by its definition, artistic approaches can be used during any or all phases of research, including problem generation, data or content generation, analysis, interpretation, and representation when addressing research questions holistically (Leavy 2009, 2017). In studies 2−4 of this thesis, various performative methods of drama were used to generate data concerning participants' understandings and their reflections on their participation experiences. Besides, poetry was used for analyses and dissemination of the sense of interconnectedness experienced by drama education students (WS2/Study 2). Table 1 explains what and how various drama practices or genres were used in different studies (2−4) of this dissertation. The table also illustrates the specific roles the researcher had during the studies.

In the second study, drama practices served as a tool for reflection on participation experiences and the potential of drama in sustainability education. I regard the drama praxis of the studies 2−4 (e.g. making still images, improvisation practices and performance-making processes) as practice-led, arts-based research and the evolving knowing not only as data, but as findings/syntheses of participatory creative performative inquiries. In the third study, theatrical improvisation practices were applied in futures education to generate data and to exemplify what kind of futures thinking and skills these practices can promote. In the fourth study, performance making was used for collective reflection on young participants' personal and psychosocial aspects of climate change.

The main method of analysing the data and the performative syntheses of all studies 2−4 was content analysis (Elo, Kääriäinen, Kanste, Pölkki, Utriainen &

Kyngäs 2014). However, the lenses or theoretical frameworks of content analyses differed in each study and they are illustrated in Table 1. The analyses processes included following phases: (1) Transcribing the video recorded processes of performative inquiry. (2) Recalling and reflection on the praxis: the experienced performative inquiry processes were recalled related to video-recorded processes. (3) Analysis and interpretation of the thematic content of the performative syntheses related to various theoretical lenses. The analyses, interpretation and writing processes were cyclic, thus the content emerging from the practice and the video recordings of the processes were scrutinized many times.

Table 1. Arts-based research practice, purpose and syntheses generated, researcher's roles and frames of content analyses in studies 2−4.

Studies	**Practice, purposes and syntheses**	**Researcher's roles**	**Theoretical frameworks**
Study 2: Drama in education for sustainability – becoming connected through embodiment	Still images were used for reflection to create syntheses on drama education students' participation experiences and their insights on the potential of drama for CCE. A research poem was created as a poetic synthesis of the drama education students' experiences of interconnectedness during forest drama.	WS 1: Participant observer & co-researcher WS 2: facilitator and researcher WS 3: co-facilitator and researcher, reflective practitioner, interpreter and "poetists"	Pedagogy of interconnectedness & relational sustainability competences (Wals 2015)
Study 3: Future thinking and learning in improvisation and a collaborative devised theatre project within primary school students	Improvisation practices were used for generating futures associations, embodied imaginary visions and futures narratives for fostering futures awareness	Facilitator, reflective practitioner, recorder, dramaturge, interpreter	Futures education, Aesthetic transformative learning
Study 4: Encounters with climate change and its psychosocial aspects through performance-making with young people	Performance-making was used for creating collective narratives and performative syntheses on young participants' reflections on social aspects of CC	Facilitator, dramaturge, recorder, interpreter	Psychosocial dynamics, Alienation, Theatrical tools of tragedy & parody

The ABR methods used in this thesis have been used by other researchers in different fields. The ABR practices used in study 2, poetry and frozen/still image-practice, have been used in research in various fields. According to Leavy (2017; 2020), writing poetry has served as a method for field text analyses or representa-

tions of data and findings. Poetic inquiry has also been used by other drama education researchers (e.g. Alsawayfa 2019 in the context of Palestine) for representing participants' experiential knowing that drama promotes.

The still image practice originally named as frozen images by Augusto Boal is a part of the wider method of Boal called Image theatre. This practice has been developed and used for promoting embodied and intercorporeal self-reflection from various perspectives also in environmental drama projects (Forgasz 2014). During Image theatre, "participants create reflective embodiments of their feelings and experiences. Beginning with a selected theme, participants "sculpt images onto their own and others' bodies", as Cohen-Cruz (2002, 237) explains this practice. The frozen image technique has also been used for living and investigation degrowth practices (Brossmann & Islar 2019).

When conducting study 2 in 2012, improvisation was not much used in research. Later the use of improvisation has increased and the term 'applied improvisation' (Dudeck & McClure 2018) has been established to illustrate how improvisation can serve various purposes in various fields of research and practice.

Devising theatre

Devising theatre[45] was the main method used and developed for research purposes in studies 3 and 4. By definition, devising theatre (Heddon & Milling 2006) is a way of collectively creating a play without a given manuscript. I used the principles of this devising theatre method that is not defined as a specific 'method' but is an approach for exploring young participants' thinking through performance making.

Devising theatre has been regarded as a valuable "pedagogy of real" and as an ethnographic research method to explore young people' identities, lifeworlds, living environments and school culture (Gallagher 2001; 2007; 2014; 2015; Gallagher & Wessels 2013). The typical interest of devised theatre seems to be drawing attention to, and disrupting comfortable notions of social reality, for example,

[45] 'Devising' is a term that is mostly used in Europe (Govan, Nicholson, & Normington, 2007) whereas collective creation is used more in e.g. in Canada as a student-authored method of making a performance. In addition, playbuilding (Perry 2011) and playmaking as Nelson (2011, 159) defines it, refer to similar methods of using "a variety of drama/theatre techniques to develop original performance work with students based on the exploration of their ideas and realities with the goal of developing and bringing their voices and visions to the audience (Nelson 2011, 159). Perry, Wessels & Wager (2013) have marked differences in these methods. According to them, playbuilding focuses on topical issues, and aims at performances with coherent narratives, linear plot and clear argumentation, whereas devising aims at allowing multiple perspectives, including various voices of the participants with less linearity and open-endedness. In my studies I do not distinguish the type of "collective creation". I use both the terms devising and collective creation, despite the aim of devising a performance in study 3 of creating a linear story with a clear message. The definition of devising by Perry et al. (2013) fits in better to the short performance workshops of the fourth study, which generated more disruptive and provocative stories with multiple aspects.

right and wrong, teacher and student, performance and play (Perry 2011). Through presenting multiple perspectives and open-endedness, devising often uncovers attitudes, content, and experience that may not fall into the typical parameters of acceptability in the classroom or in normal social interaction (Perry 2011). Hence, devising may generate knowing that more conventional research methods might not generate.

Devising depends on "the partial, on the incomplete, and on the incongruous as essential sources of creation" (Perry 2011, 73). Thus, it is demanding and often frustrating for the participants, teacher and researcher (Wessels 2012; Perry et al. 2013). Including and representing the voices of all group members is often problematic and individual and collective satisfaction of collective creation cannot be guaranteed in the play building process (Perry et al. 2013). In addition, devised theatre is sensitive for power issues (Wessels 2012), as it is "at odds with much of the underlying foundations of the school system" as it "does not encourage consensus of interpretation or cohesion of behavior" (Perry 2011, 71). Nevertheless, the challenges and emerging conflicts in collaboration can be understood as signs of real inclusive dialogue (Gallagher 2007) and as learning about "interdependence" (Neelands 2009).

5 Presentation of studies 1−4

In this section, I present studies 1−4. The aim is to explain why and how I conducted these studies and applied the specific methods of drama and what were the findings of the studies. In Appendix 1 Table 3 summarizes the research question, theories, methods and results of all the articles. The first study is theoretical, thus the structure of presenting it differs from the rest of the studies. The study descriptions of studies 2−4 include 1) background, 2) pedagogical and research ideas, 3) description of praxis with ethical and critical reflections and 4) the outcomes as reflective and performative syntheses. The performative syntheses exemplify the knowing that drama practices generated.

When I present studies 2−4, I refer to the concepts *pedagogy, praxis and performance* to "establish a clear rationale" for my practice as Nicholson (2014, 44) referring to Lather (1991; 1992) recommends. The *pedagogical idea* clarifies the thinking behind the project and responds to the question why I conducted these practices as I did. Thus, the pedagogical idea of each study is based on my theoretical and practical (tacit) understanding why these specific drama practices are relevant for addressing the specific issues of climate change education. Therefore, presentations of the studies in the following sections also include theoretical aspects that explain the pedagogical idea. *Praxis* describes how the pedagogical ideas were embodied in practice and how the emerged knowing was generated through the specific drama practices. In addition, praxis involves a critical reflection on the practices applied in the studies, my experiences in the role of teacher-researcher and the tensions and dilemmas that I faced and struggled with during the studies. *Performance* refers to the outcomes, the knowing that evolved from the praxis that is both performative and conceptual.

Figures 1, 7 and 8 condense the idea, outline and structure of the performative inquiries of studies 2−4 according to their 1) pedagogical ideas that are 2) embodied in praxis that engendered 3) outcomes as performative and poetic synthesis and reflective findings that consist of practical knowing and conceptual understanding of the meaning and value of the chosen practices. I hope that figures 1, 7 and 8 clarify the idea of studies 2−4, even though as simplifications they miss or lack the relational and iterative qualities of drama.

5.1 Study 1: Pedagogy of interconnectedness for encountering climate change as a wicked problem

Research question: What kind of awareness of interconnectedness is essential in climate change education and why?

In this section, I present the background and summarize the findings of study 1, presented in article 1: Lehtonen, A., Salonen, O., Cantell, H. & Riuttanen, L. (2018). "Pedagogy of interconnectedness for encountering climate change as a wicked problem." This study approached climate change as a signal of severe, wider sustainability challenges that requires carefully considered pedagogical responses that take into account the root causes and promote a systemic understanding.

The thinking behind this article derived from the time I worked as a project researcher for Finnish Climate Panel, when I had opportunities to discuss with key stakeholders who had been pioneers in developing CCE in Finland for a decade. Figures 1 and 2 (presented in article 1 on p. 863−864) condense the thinking that was developed at that time and after reading the book *Education and Climate Change* edited by Kagawa and Selby (2010). The thinking was also enriched in transdisciplinary dialogues during the research project, "Education for a Changing World", funded by Sitra (Finnish Innovation Fund). At that time I understood that the traditional focus on human-nature relations of environmental education needs to be widened in the context of climate change and that the social aspect is at the core of CCE. In addition, I acknowledged that addressing root causes and psychological aspects are essential in CCE, as prevailing worldviews and dominant ways of knowing do not provide effective responses to climate change, which is a wicked problem[46] (Rittel & Webber 1974; Incropera 2016) in its nature.

In addition, I learned that human maladaptive coping is a huge environmental challenge (Glasser 2018) and the human/psycho-social issues make climate change and its education a complicated issue to address. This is because humans do not act as they should according to the current knowledge about the severe consequences and effective mitigation strategies (Incropera 2016; Cantell et al. 2019). During the study 1 reflected on the challenges of CCE on the meta-level in collaboration with Hannele Cantell and Arto Salonen.

[46] Incropera (2015) describes climate change as a wicked problem: a huge, complex and systemic challenge and difficult to clearly define. Climate change is "scientifically apparent, but it presents immense scientific, economic and social complexity and uncertainty as the solutions have unforeseen consequences". Different stakeholders provide conflicting information related to climate change, its relevance and impacts. Climate change generates profound ethical issues and lack of agreement on defining the problem, its causes, consequences and possible solutions. "In addition, maladaptive behaviour, the cultural and emotional aspects of climate change make it difficult to find efficient solutions or predict the results". Lehtonen, Salonen & Cantell (2018, 344) referring to Incropera (2015) write.

The aim of study 1 was to promote a critical pedagogical awareness of what kind of systems thinking is essential in CCE and how modern dichotomies have an impact on education as prevailing, problematic meta-level thinking that promotes unsustainability and climate change. As a result, the article summarizes the principles for a "Pedagogy of interconnectedness" that underline the importance of understanding the interconnectedness of the world, the interdependence of global ecosocial systems and seeing humans and learning in an interconnected, holistic way. *Climate.now*, an on-line course for higher education, was chosen and presented as an example of how a pedagogy of interconnectedness could be applied in practice.

Findings of Study 1

When looking for the origins of climate change, it is justifiable to connect the beginning of a dramatic increase of CO2 emissions in the atmosphere with industrialism, the enlightenment and modernism[47]. Especially segregated knowing, and not taking human impact and dependence on ecosystems into consideration in societal decision-making has led to unsustainability, and this is related to modern dichotomized thinking. Dichotomies such as seeing human culture and nature, individual and social, global and local, reason and emotion, and mind and body as separate dichotomies have been related to unsustainability. As the modern ideals of rational humanity, objective, categorized knowledge and competition have been inherent in education, and the vital understanding of human dependence on socio-ecological systems have not been focused on, critical awareness of them is essential in education, too.

The mind and body dichotomy, most famously associated with Cartesian dualism (Crane & Patterson, 2012) has been identified as the root that has promoted an instrumental, objectifying relation to nature, the human body, other people and cultures. Reason has been considered a human quality that implies the superiority of humans over other animals in Western philosophy (Wolff 2011, 85). Human alienation from ecosocial relations has resulted in neglect of the individual or local impact on global ecosystems that has led to severe sustainability challenges such as climate change (Vogel 2015). This alienation might be the reason for the lack of understanding of how individuals interact with the common physical, ecological and social reality of climate change. Seeing nature as an object of instrumental benefit has led to such attitudes as indifference and overconsumption. The impact of private individual acts or thoughts has not generally been taken into account as significant in the social and global reality.

[47] Modernism and the modern era are vague commonly used concepts. The existence of the modern project has been questioned e.g. by Bruno Latour (1993). See more in section 2.2, pages 10, 13.

Individuals might feel separated from the social production of reality, and might ignore their impact on the common ecological and collective psychosocial reality (Vogel 2015). Decision-making has been based on the separateness of social and economic and ecological systems, and on reasoning with a false assumption of the separateness of emotions and values (Laininen 2018). However, maladaptive behaviour and the social and psychological aspects of climate change are among the factors that have brought sustainability problems to a wicked level (Glasser 2018). Climate change is an unintended socially produced result of individual, but also socially organized and structured behaviour (Vogel 2015).

Interconnectedness is central in several dimensions of sustainability. Interconnectedness emphasizes the relational understanding of reality where things exist and function only as relational entities (Naess and Rothenberg 1990, 56). People are part of eco-social systems, and cultural attitudes and responses to climate change are socially produced and organized. Natural conditions and people's living conditions are interdependent, and local and global are interrelated. Each person is involved in a part of the continuous social construction of reality, and individual choices of living and thinking have an impact on the common global reality of climate change. Moreover, individuals are involved in defining norms and taboos by acting or not acting, speaking or staying quiet, and even by thinking.

Complementary ways of knowing are called to deepen the understanding of interconnectedness, complexity and critical aspects and to create new ideas and alternative visions of a sustainable life. Enriching rationality, analytic and mechanistic knowing with embodied and creative ways of knowing, emotional and ethical intelligence are critical in envisioning and creating a more sustainable future (Kagawa and Selby 2010). Sustainable decision-making needs to be based on relational intelligence, including both emotional and ethical intelligence (Pless & Maak 2005) and common good thinking (Glasser 2018).

Principles of a pedagogy of interconnectedness:

A pedagogy of interconnectedness underlines the following aspects of systems understanding that is at the core of the challenges of CCE:

A view of oneself, the human and the world as relational: integration of human culture and nature, the local and the global.

- Understanding of the interdependence of and becoming connected with nature and society, global ecosystems and the community of people.
- Becoming aware of oneself being a part of and having an impact on global ecosocial reality and global ecosystems.

Integration of the individual and social: individual acts, thoughts and attitudes construct the common reality and matter.

- Becoming aware of how emotional and value-based responses to climate change are socially organized by norms and taboos and how every individual is part of this socialisation process.
- Becoming aware of how the individual and common good are parallel on a longer time scale.

The integration of mind and body, reason and emotion, intuition, and arts and science.

- Becoming connected with oneself, with integrated and embodied experiences, thoughts, feelings, needs, values and your own creativity related to the body and mind.
- Becoming aware of how emotions interfere in knowing and guide personal values.
- Deepening the understanding of humanness and search for sustainable humanness and solutions for a sustainable life.
- Searching for alternative ways of seeing reality; a creative visioning of sustainability.

Pedagogical suggestions

Collaborative, participatory learning and exploring real-life issues are suggested as suitable pedagogical approaches for promoting an awareness of interconnectedness, as these approaches could integrate individual and social realities, and foster active agency and relational systems thinking. Moreover, integrating art and science into learning processes is recommended for enriching rational thinking with intuitive thinking and cultivating creativity and an embodied and emotional understanding of the wicked sustainability challenges of humanness.

Climate.now, an online course for higher education, exemplifies how pedagogy of interconnectedness can be implemented in practice. The learning approach of Climate.now is based on systemic, participatory, dialogic and experiential learning. The learning packages of Climate.now offer multidimensional perspectives on climate change as an interconnected physical, ecological, societal, cultural and ethical issue that is reflected in different connections and contexts, integrating both local and global perspectives. Students' personal relationship with the topic, the integration of the social and the individual, and critical thinking are enhanced by writing learning diaries that aim to promote reflection on climate change also from ethical and emotional perspectives. The course design aims at engaging students by promoting an awareness that each person and field has a crucial role in climate change. The principles of a pedagogy of interconnectedness are also visible in the criteria for assessment of Climate.now.

5.2 Study 2: Drama in education for sustainability – becoming connected through embodiment

Research question: What kind of transformative, interconnecting, embodied learning appears during the course Drama in Education for a Sustainable Future?

The second article of this thesis, Lehtonen, A., Österlind, E. & Viirret, T. L. (2020). "Drama in education for sustainability – becoming connected through embodiment", presents a study drawing on a special course Drama in education for a sustainable future (DESF). My personal interest in this study was to have dialogue and collaboration after conducting self-studies on my own practice. I wanted to widen perspectives on how drama can serve education for sustainability and climate change education. I was willing to compare my own thinking about the potential of drama for CCE with experienced drama teachers' and students' reflections.

For this purpose, our teacher-researcher team designed a special course for experienced students of drama education. The design of the course brought together two workshops (WS1 and WS2) that focused on two essential aspects of sustainability education: 1) climate change as a global sustainability issue that necessitates an understanding of local perspectives and 2) human-nature relations. The first workshop was designed and conducted by Professor Eva Österlind. The second workshop was designed and conducted by myself. A third workshop (WS3) was designed in collaboration with the author team and it concentrated on reflection through drama and served our research interest of using drama practices for research.

The reflective insights about the essence of drama in education for sustainability were expected to emerge on the basis of the participants' reflection on their participation experiences. Thus, the evolving understanding about the value of drama in sustainability education was based on the demonstrative workshops and participants' reflection and pedagogical thinking emerging during drama practices and their reflection on them. Hence, the participants' experiential, propositional, practical and performative knowing was involved (Heron & Reason 1997). Figure 1 summarizes the pedagogical idea, praxis and reflective findings and performative syntheses that were generated during study 2.

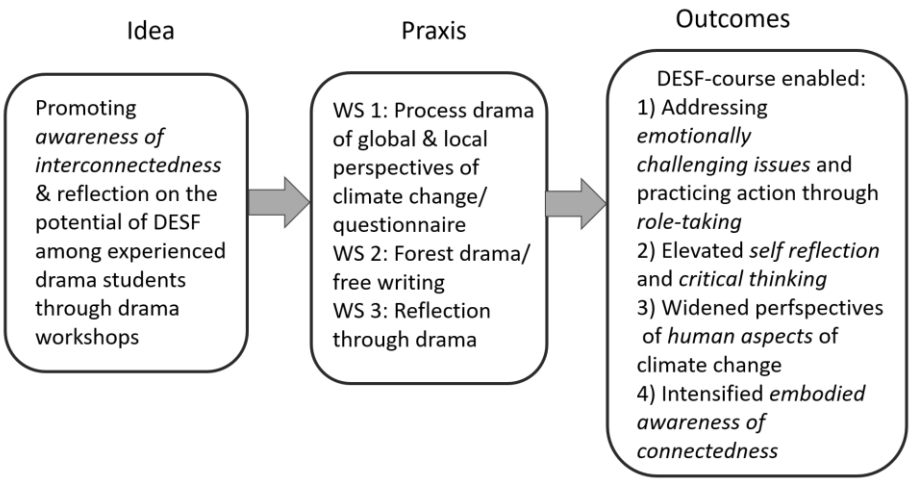

Figure 1. Pedagogical and research idea, praxis and reflective findings of study 2

Pedagogical idea

The goal of the first and the second workshop of the DESF course was to promote experiential knowing about the potential of drama in sustainability education. The first workshop (WS1) included a process drama on the global, social and individual aspects of climate change. The second workshop (WS2) was an outdoor, embodied drama workshop on personal relations to nature. The aim of the third workshop was to conduct collective reflection on the participation experiences of WS1 and WS2, thus the third workshop (WS3) was a reflective workshop, where the potential of drama was reflected and related to the participation experiences of workshops 1 and 2. The reflection occurred through personal reflection, discussions and drama practices.

The course design was based on the principles of pedagogy of interconnectedness. The focus was on the embodied, connected knowing that drama can promote. This included connection with oneself, with personal sensual, embodied and creative knowing, with other participants and with global sustainability issues and their various socially constructed responses. Beside interconnectedness, emerging learning was analysed related to relational sustainability competences (Wals 2009; 2015), such as knowing, being and acting differently and learning to know, critique change, be and care. Moreover, we looked for signs of transformative learning, and impact on and motivation to change (Mezirow 2000; Sterling 2010).

Praxis

The course was designed as a research-based practice (Haseman 2006). The DESF students were informed about the research purposes already in the course advertisement and the research was an integral part of the whole course. Informed consents were obtained from the DESF course participants. We told all the participants about the research interests of developing methods of drama for education for a sustainable future and our interest in getting their feedback and understanding their experiences. We emphasized that especially critical reflection and feedback, and emergence of negative experiences would be very valuable. Moreover, the volunteer participation was stressed and the participants were reminded of their option to withdraw from the drama practice and research at any time.

Multiple data were collected during and after the course. The data consisted of video recorded practices, reflective writings and discussions during the course and reflective essays after the course. In addition, the participants were asked to reflect on their participation experiences a year after the course. To summarize the results of this study, our understanding of the potential of DESF was based on the personal and collective reflections among the teacher-research team and on the participants' experiential, practical, propositional and performative knowing evolving during the course.

This course was aimed to serve as an example of how drama can promote an awareness of interconnectedness by widening perspectives to sustainability issues and as a pedagogical practice. The drama practices integrated fictive/imaginary, emotional, embodied and cognitive thinking. Embodiment was a special focus in the course design. Workshops 1 and 2 addressed relevant aspects and aimed at promoting an awareness of interconnectedness of local and global and human-nature relations. Workshop 1 focused on climate change as a global sustainability issue that necessitates an understanding of human aspects and local, different stakeholders' perspectives. Workshop 2 concentrated on human, personal relationships to nature. The structure of all the workshops followed the phases of translation mechanics (Gerber-Myers & Coffman 2017, see page 33), beginning with personal reflections, enriched with cumulative dialogues and ending with performative syntheses.

Workshop 1 - From the global to the individual – Explorative process drama workshop in ESD

Workshop 1 was originally designed as an example of drama teaching for students with no previous drama experience. This workshop involved a reflective phase where individual and collective reflection was conducted through introspection, brainstorming about sustainability challenges and making still images on the human causes of unsustainability. The dialogical phase of the workshop consisted of

a role-play of a fictive environmental conference where the focus was on climate change. The role-play aimed at promoting deeper insights into climate change as a sustainability challenge from different stakeholders' perspectives. Within the role-play, a teacher-researcher played the role of a host. At the imaginary conference, every team presented their views and interests related to climate change and discussed the issues in mixed groups. Afterwards, as a synthesis of an imagined journey home, the student s in their roles were asked to comment on their experiences of the conference. The workshop ended with guided relaxation and introspection to engage the participants in reflection, how their experiences could be transformed into action and initiatives to sustainability.

Workshop 2 − Into the forest's arms – Reflections on one's personal relationship with a forest

The second workshop took place in a Finnish forest, which was located in a nature protection area by the sea. It consisted of embodied personal sensual reflection practice in its own spot in the forest, embodied nonverbal poetic dialogues of personal reflections and group improvisations to create nonverbal poetry and transform their experiences into collective performances.

Workshop 3 – Reflection through collaboration and embodied creation

Reflective workshop 3 began with personal reflection on the participation experiences that was conducted through personal reflective writing. That was followed by collective reflective dialogues on the basis of personal perspectives. Then the participants' experiential knowing became shared and related to their and other participants' tacit/practical and conceptual/propositional understanding of the essentials of learning in drama. On the basis of this experiential, practical and propositional knowing, participants were asked to create in small groups short collective performances on given perspectives. Firstly, the participants were asked to create a still image on the basis of reflection on the participation experiences. Secondly, they were asked to create in small groups snapshots of the future, improvised scenes on their reflection on the future. Thirdly, a brief lecture about human alienation and the theory of interconnectedness was given to inspire and enrich the discussions. Thus, all three steps included a combination of drama work and reflective discussion.

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Reflections on praxis

Personally, I was delighted, inspired and grateful for the opportunity to collaborate with experienced drama educators and researchers, to test my practice with experienced drama education students and to try out drama in research. I found a connection between my own thinking, teacher-researcher's team and the participants' reflections on how drama can promote interconnectedness.

Study 2 and the design of the DESF course were based on the idea of research-based practice. Workshops 1 and 2 focused on pedagogy as they were designed as examples of implementing drama for sustainability education, while the research focus was dominant in WS 3. Unlike WS1 and WS2, the workshop design of WS 3 was not that an inspiring or coherent experience according to the participants' reflections. Moreover, we acknowledged that emphasis on research, filming and the teacher's presence during reflective discussions might have had some impact on the participants' reflections on their experiences conducted in small groups. Be this as it may, the reflective discussions and writings during and after the DESF course brought up valuable reflections as presented in Reflective findings after this section. In addition, during the reflective discussions the participants raised an essential criticism of how process drama of WS 1 had provoked stereotypical thinking.

The question of stereotypical thinking and the role of media having an impact on our thinking related to sustainability issues is essential in climate change education. The participants also noted the tendency to stay on the surface in discussions on the level of stereotypes in relation to the emotionally laden theme and avoid talking about what 'I' or 'we' can do. The tendency to discuss sustainability issues at a general level can be seen as a way of maladaptive coping, to avoid confrontation about personally sensitive issues. However, recognizing and focused reflection upon these issues may contribute to an increased awareness and a deeper understanding of individual attitudes and behaviour.

The critical notion of stereotypical roles was related to the workshop design, where no time was given to prepare profoundly for individual, multifaceted role characters. In order to avoid the strengthening and emergence of stereotypical thinking in drama, self-reflection is essential and role-construction needs to be sufficiently deepened by sharing and reading facts and by reflective discussions. Therefore, deepening the critical aspect of study design would be valuable in the future studies for further developing drama in education for sustainability. As the study stands now, it seems to be rather uncritical and to promote 'drama for everything' thinking. When analysing the participants' reflection we acknowledged that the positive experiences and impact of drama might have been emphasized as future drama education students presumably consider drama to be positive and valuable and hence the discussions might neglect the negative aspects. However, drama education students presumably were able to reflect deeper on the potential

of drama as they already had experiences and practical knowledge of drama. Österlind (2019) has compared the reflections of WS1 with different kinds of groups of students as participants in the same process drama workshop. According to her findings, the participants of study 2, the experienced drama students, provided deeper reflection and also critical aspects compared to other kinds of participants who had almost no previous experiences of drama. For this reason, the critical aspect of stereotypes brought by the participants was especially valuable for further developing knowhow of drama in sustainability education.

Reflective findings

The participants brought up relevant aspects and values of applying drama in sustainability and climate change education related to their participation experiences. This study was in line with the findings of other studies how drama can enable *emotional distancing*. The participants had expressed eco-anxiety, feeling powerless and numb in front of the overwhelming global sustainability challenges. According to the participants' reflections, emotional distancing, using humour as a coping strategy, sharing their thoughts and working with these issues together with other people can help and helped them to cope with their eco-anxiety and to emotionally distance themselves. The participants also found that going to the forest after working with emotionally challenging sustainability issues was comforting.

To summarize, drama was regarded as a powerful tool by experienced drama education students. The participants reflected that their participation experiences had had an impact on the participants' behaviour and attitudes. They recalled their experiences well even a year after the course. From the perspective of interconnectedness, DESF made it possible to dismantle and integrate the dichotomies of art and science, the individual and the social, nature and culture, the local and the global, reason and emotion, and the mind and the body.

Embodiment was a special focus of the DESF course design. The practices that had a specific focus on embodied awareness, such as the introspective exercises of WS1 and WS2 and the embodied poetry of WS2 seemed to intensify the sense of connectedness with oneself, others and nature (WS2). The sensuous self-reflexivity practice of WS2 seemed to open the senses to listen to oneself and nature and thus promote sensitive and imaginary encounters with oneself, nature and childhood memories. This sense of connectedness apparent in the participation experiences is illustrated in the research poem (p. 53−54).

The course seemed to promote relational sustainability competences (Wals 2015, 11) as learning to *know, critique, change, be* and *care*. Especially the process drama (WS1) had *widened* their *perspectives* on the human aspect, different stakeholders' conflicting points of view to climate change and sustainability. The

issue of *critical awareness* was raised, namely how interaction was difficult between different stakeholders who looked at the issues from their own perspectives. The participants also raised the criticism that the process drama of WS1 had provoked *stereotypical thinking*, as explained earlier. Intensified embodiment and emotional engagement in creative dialogue and collaboration, thus *being differently* in drama, seemed to promote a deeper understanding of the interconnectedness of sustainability and motivate acting differently, as Figure 4 on page 22 of article 2 illustrates.

In this study, the performative and poetic knowing that are typical for drama was illustrated through two examples of performative syntheses: still images and the research poem. These practices seemed to suit well in presenting performative and poetic knowing that emerged among the participants of DESF. The still images provide the participants' insights into the potential of drama for sustainability education. The poem seemed to capture the essence of the participants' participation experiences of WS2, namely how conducting drama in the forest seemed to provide experiences of interconnectedness. These practices and the performative and poetic syntheses they provided are presented in the following sections.

5.2.1 Still images as a performative synthesis of *embodied, dialogical, experiential knowing*

In study 2, pictures of still image practice exemplify and illustrate the embodied, intercorporeal and reflective empathising knowing that drama can generate. These pictures manifest the participants' performative embodied, intercorporeal, experiential reflection on the experiences of participation and the potential of DESF. Before the still image practice the participants had written freely and discussed their participation experiences in small groups.

The still image practice derives from Augusto Boal's (1995) frozen image technique and it is regarded as useful for dialogical, social reflection. In this practice, participants create an embodied position while watching others making and taking up their positions. Then the participants became aware of their own and others' intentions and ideas through intercorporeal reflections that generated reflection integrating cognition, emotion, imagination and bodily awareness. During the still image practice, individual embodied reflective expressions become in intercorporeal dialogue with others' reflective expressions. In the still image, the participants perform their reflections, thus they are in a role. The other, "the audience" does not know whose thinking they perform, whether the person is performing her/himself or someone else.

These still images presented in article 2 provide a performative synthesis of the participants' experiences and their dialogical reflection. This synthesis was thus based on their experiential, practical and conceptual reflection. These still

images seem to perform essential aspects of drama as arts-based sustainability education.

The process of making still images during WS3 is explained in article 2 on page 17. During the still image practice, the participants were asked to recall the essence of their participation experiences of WS 1 and WS2 through bodily expression. Even though while making a still image groups of participants seemed to rather quickly agree on the content and form of their still image without much negotiation, in the still image they seemed to have contact with each other and the still image created a multifaceted response to the theme through embodied and emotional expression. At the end of the practice, a verbal synthesis was expressed through thinking aloud a thought that in turns in a few words. These 'think alouds' are presented in the picture in speech bubbles.

Figure 5. Different aspects of DESF.

The first picture (Figure 5) illustrates what kind of experiences and reflections drama workshops 1 and 2 had raised. The person lying on the ground performs how drama in the forest had encouraged sensitive recalling or *re-experiencing* her childhood *memories* of connectedness with forests. The person in a squatting position performs her *critical reflection* on what should be prioritised in DESF, how the drama workshop in the forest had raised critical thoughts on the practice of "hugging trees", and that sustainability education should focus on other more im-

portant issues. The third person on the left reflected how drama can *activate people* by focusing on experiencing the relations with the substance *in role* without accusing. In the still image she performs a smiling call to people to act. Whereas the fourth person on the right manifests how the WS1 and WS 2 had awakened *critical self reflection*, and asks whether she should do something about sustainability issues.

Figure 6. Still image – reflecting on the personal and the other, the relations between individual and social in DESF.

The second still image, presented in figure 6, illustrates the potential of drama through the participants' reflections on their participation experiences. In the picture the first one from the left expresses her reflection on how drama enables widening one's time perspective from *living through* personal childhood *memories* and relating it with the current relationship with forest. The second one from the left expresses how in drama one might be deep in one's own thoughts, but together with others. The third person from the left expresses her *self-reflection* on her personal relations to forest, how she has a strong ownership of the forest and how in drama the *personal becomes shared* and it might be a challenging experience[48].

[48] For Finns the experiences and forest relations are often rather private and not shared.

The second from the right expresses and reflects her experiences of how she could step into the role of free rider in the role play of WS1. In the discussion before making the still image she reflected how the process of drama allowed *though the shelter of the role stepping into the shoes of a questionable attitude* of not caring and focusing on hedonistic behaviour without social pressure to show an appropriate environmental attitude. The first person on the right expresses her reflection on how drama can bring people together and enable a *sense of connectedness* among the participants.

To summarize, pictures of still images perform an intercorporeal dialogue, typical for knowing drama, that could be relevant for CCE and for sustainability science in providing complementary, embodied knowing of experiential and psychosocial aspects of sustainability issues. The still images illustrate the participants' reflections on how workshops 1 and 2 of the DESF course had brought people together and encouraged both self-reflection, living through memories and sharing them. The workshops had also raised critical thoughts and enabled practising action through role taking. Role taking had provided a shelter for living through questionable attitudes and behaviour. Thus, the pictures of still images manifest both the potential of drama in CCE and various social responses to climate change.

5.2.2 Research poem as a synthesis of participation experiences and example of *poetic knowing*

The experiences of being in the forest in WS2 were reflected directly after the workshop through free writing. The reflective writings were analysed with thematic content analysis and a research poem was constructed on that basis. The poem presented on the following page is a synthesis, composed by myself in the role of the teacher-researcher. It brings together the participants' reflections on their participation experiences in a poetic dialogue.

The poem was constructed after reading and analysing the content of the participants' reflective free writings several times. While analysing the content of the participants' writings, I first aimed at distancing my personal experiences from the participants' reflection and then aimed at recalling my personal experiences of the workshop and compared them with the participants' reflections. I chose this form of poem for presenting the "findings" for three reasons: The workshop included a practice described as non-verbal poetry. Furthermore, several free writings were written in poetic style or included rhetorical sentences, questions or statements. When I read them several times, my reading experience was that the writings seemed to be in dialogue with each other. The lines of the final poem are nearly literal quotations out of the participants' writings, thus this poetic analysis

resembles found poetry[49] (Faulkner 2017) as the words were extracted from transcripts and shaped into poetic form. The poem is also a narrative, thus it is also reminiscent of generated poetry as it "stresses the moments of subjective feelings and emotions in a short space. The structuring of the poem aimed also in creating a collage, an experiential path in the forest, thus it also resembles generative poetic inquiry.

The themes of the poem emerged from the content analysis are 1) a sensuous, embodied encounter with the forest and the spring; 2) a reflection on the past and the present); 3) a fairytale or mysterious encounter with a person not physically present; 4) being present, a confrontation with and acceptance of oneself and one's personal emotions; 5) overcoming a feeling of strangeness; 6) respecting nature and a sense of connectedness with nature and 7) a sense of holistic interconnectedness. The numbers at the end of each line refer to specific essays (N=14) in which the thought derived or the idea were apparent and highlight the shared points of view.

"Alone, but together"

Today, I met spring.
In peace, but there was no silence. (5, 8, 10)
The forest called me. (1)
- I am sorry, if I am disturbing you.
But the forest replied:
- Look, I have plenty of room.
On the bridge between past and present (1, 2)
I met my mother as a fairy. (2)
Comfort and joy.
I am here myself the way I am and I am present. (6, 9, 10, 11, 12, 14)
- Why can't I live like a child? (11, 13)
Feeling strange, but enjoying. (3, 8, 12)
- Couldn't I do things in my own way? (12, 13)
Nature's work of art (5, 7)
A symbiosis, a connection between a tree, moss, a stone and an animal.
- How many passers-by have seen and wondered at this? (5, 7)
I am a part of the whole. (1, 7, 12, 13, 14)
Alone, but together. (1, 7, 14)

[49] Faulkner (2017) identifies two ways of approaching poetic inquiry as *found* or *generated* poetry and *autobiographical* poetry. In found poetry words are extracted from transcripts and shaped into poetic form, whereas in autobiographical poetry the researcher uses her own words to share understandings of her own and/ or others' experiences (Butler-Kisber, 2005). Found and generated poetry can also be classified as either narrative, poetry that tells a story, or lyric poetry, the goal of which is to 'stress moments of subjective feeling and emotion in a short space' (Faulkner, 2005: 6).

The poem aims to capture the essence of the participants' participation experiences, how conducting drama in the forest (WS 2) seemed to provide experiences of interconnectedness between the participants and with nature. The poetic presentation brings the participants' experiential reflections into dialogue and as an arts-based synthesis aims to enlighten the typical poetic reflective, experiential knowing that drama can promote. Besides, dialogues with the forest were essential in the participants' sensitive and intensive learning experiences, thus the forest was an impressive actant in the learning process.

5.3 Study 3: Future thinking and learning in improvisation and a collaborative devised theatre project within primary school students - example of *associative knowing*

Research question: *What kind of futures thinking and skills do improvisation practices and performance-making promote and how?*

The third article of this thesis, Lehtonen, A. (2012*).* "Future thinking and learning in improvisation and a collaborative devised theatre project within primary school students", presents a study drawing on the data that was collected from/during future improvisation practices and a devising theatre process called "Save the future" that I conducted with my own class of students. The aim of this project was to develop my own practice as a futures and drama educator. The idea was to implement improvisation and devised theatre methods in a collective inquiry-based futures learning project. This four-month futures education project was conducted in 2008 as part of my drama studies and my work as a primary school teacher. During this period, I worked as a normal class teacher for 5th graders in a typical Finnish primary school, which was located in a metropolitan area of Finland. The students were from socioeconomic heterogeneous backgrounds and about 20 per cent were from immigrant backgrounds. I was not experienced in conducting devised theatre despite my experiences of conducting several play-making projects without a given script with my previous students on different themes related to e.g. history.

My interest in developing futures education and implementing improvisation practices derives from my experiences as a primary school teacher, specialized in environmental education and drama, willing to explore of the experienced gap between sustainability rhetoric and schools unsustainable practices and prevailing consumerism culture. I experienced felt that sustainable alternative ways of living and schooling did not exist. My further education studies in drama encouraged me to try out drama and theatre improvisation techniques. Figure 7 summarizes the

pedagogical and research idea, praxis and reflective findings and performative syntheses that were generated during study 3.

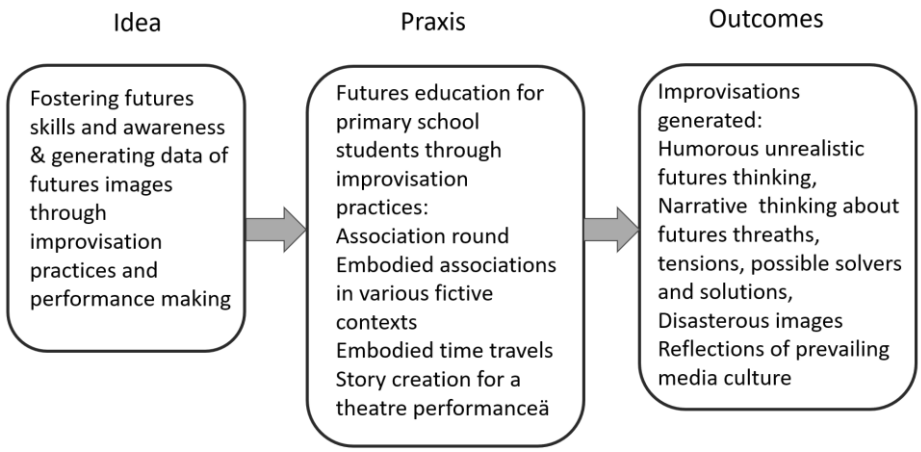

Figure 7. Pedagogical idea, praxis and reflective findings of futures improvisation and devising theatre practice.

Pedagogical idea

the thinking behind the project derived from futures education goals and its basic assumption, how future thoughts, in which we believe, affect our future. Hence, the core goal of futures education is to become aware of the preconscious futures assumptions, beliefs, thinking, and creation of alternative futures visions. Furthermore, futures education emphasizes proactive attitudes towards the future through active participation and empowerment (Haapala 2002).

The other theory behind this project is the model of transformative arts-based learning process by Sava (1993), Teerijoki (2001); Østern (2006). This theory describes how participants' personal experiences and reflections become transformed into drama and how arts-based interaction between the substance and participants' inner processes transform the relationships with oneself, the theme and other participants. This theory is explained more in detail in the section 4.3 on page X.

The aim of the project was to explore futures assumptions, fears, worries and alternative futures visions among the 11−12-year-old students. Besides, the aim was to promote creative futures thinking skills among the participants, and to offer empowering experiences of creative collaboration. My idea was to try out how different theatre improvisation practices would work out to explore this specific theme and what kind of futures thinking these practices would promote. Theatre

improvisation and play building were chosen as methods for futures education for several reasons. Futures thinking is based on imagination integrated with facts of the past and current and various scenarios (Rubin 2013). Therefore, there are no ultimate truths or right answers in futures visioning. Whereas improvisation practices aim to encourage spontaneous, embodied, imaginary and narrative thinking that is essential in futures education.

Praxis

The aim of study 3 was to develop drama practices for futures education. The methodological design of the whole project derives from ethnographic and auto-ethnographic practice. I video recorded my practice and wrote reflective notes after every session. I told my students about my interest in getting their feedback and understanding their experiences to develop methods of drama for futures education and education for a sustainable future. I emphasized especially the value of critical reflection and feedback, and the experience of negative experiences.

The research was designed according to the ethical principles. The informed consents were obtained from my students' parents. In addition, I brought up the principle of volunteer participation several times during the drama sessions. In the beginning of the process, some students preferred just to watch others' improvisations. Due to misbehaviour, a few students could not participate in all the lessons. I did not regard anonymity as an important issue in this study, because the focus was on the collective improvisations, the collective creation process of the devised theatre performance, and on my action and thinking as the teacher, not on students' individual responses or interaction.

Before starting the futures improvisation practices, the general principles of improvisation like respect, volunteering, accepting others' ideas were presented and rehearsed with the students during some weeks. In this project, I tried out altogether eight improvisation techniques with my own class, of which four practices were selected for further development and tested with two other classes of fifth and sixth graders. The imaginary time travels were conducted in carefully selected small groups in order to create a safer space for the imagination.

I video-recorded all the improvisation lessons, transcribed them and analysed the content of the future improvisations and evolving futures thinking. I wrote extensive field notes and all the lessons including the improvisation practices and the whole play-creation process, and its evaluative collective reflections were video-recorded. Furthermore, I used my teaching material, students' drawings and answers compiled in my data, which I analysed by applying content analysis. Based on this process together with the theory of the aesthetic transformative learning process (Sava 1993; Teerijoki 2001; Østern 2006) I formulated the model, "Goals of future learning during a collaborative devised theatre project"

that is presented in article 3 (Lehtonen 2012). This model illustrates the futures capabilities that can be learned during different phases of the futures play building project.

Certain theatre improvisation practices were selected to promote specific futures thinking skills such as a spontaneous futures association round; embodied collective imaginary visioning of alternative futures and futures in different contexts; embodied time travels; and storytelling.

The material evolving during these practices were used for both research and learning purposes: to promote futures awareness and creative thinking, and to collect qualitative data on the young participants' futures thinking. Besides, the emerging futures thoughts, emotions and images were used as inspiration and material for further creative activities and research (preferable, threatening, possible and plausible futures).

Futures improvisation practices:

Association round

In this practice, participants were sitting in a circle and everybody in turn said whatever came into their mind. After the general futures association round, more specific rounds were conducted about what I like, what I wished for in the future, what I don't like, what I am afraid of, etc. These associations were used as inspiration for writing poetry.

Collective, embodied associations in different contexts

Each in turn joined the collective embodied image about the future town, forest, school, home, hospital, and threatening and preferable futures. Most students participated actively and brought up personal ideas in the association rounds and body images. The evolving thinking consisted of individual ideas; the emerging thinking was not collective or coherent. The participants seemed to bring up funny, humorous, exciting, and ordinary ideas.

Embodied time travels to the future

Each in turn led a small group to time travel to the future. The leader decided at which time they travelled and imagined and told what it was like and what happened in the future. All the members of the group followed the leader and moved, improvised and acted according to the leader's storytelling. The idea was to promote free associations and imagination of the future.

After some small confusion, excitement and suspicion in the beginning, the students seemed to participate with enthusiasm. When the principle of no right

answers exists and it was said that there was no need to create special or funny thoughts, the students seemed to be relieved and started to express spontaneously what they had invented or what came into their minds. The students seemed to be rather confused about what kind of future thoughts might come into their minds. Even if every time travel was unique, there were some common features of improvised futures thinking.

Storytelling

This practice applied Keith Johnstone's (1996) story-telling structure. First, I tried out embodied, verbal, and collective storytelling, but it did not work out as it demanded too much concentration. Therefore, I created a sheet with questions and gave more time to the students to invent their ideas for stories in small groups. These questions included 1) Futures threats and tensions: what and/or who were in danger. Who was/were causing the danger and why? 2) Possible solvers and various solutions, 3) Result: which solution works, what happened to the threat and to the solvers in the end. The answers and evolving ideas were negotiated and used during the play building process.

In Table 2 on the following page "Futures improvisations", all the improvisation practices are illustrated and analysed, including what kind futures thinking and orientation they promoted among these groups of students. The images emerged in improvisation practices were reflected together with the students afterwards and compared with knowledge about futures according to different scenarios outside the drama lessons. However, during the improvisation practices I aimed to emphasize respect for all the participants' expressions as such.

Table 2. Futures improvisations and the content of emerging ideas and visions.

Improvisation practice	**Futures thinking**	**Orientation during practice**	**Typical examples**
Association rounds:	Spontaneous associations produced unrealistic thinking such as everything will be flying and whatever is possible. Expression of emotional content. Horror films (threatening future)	Majority participated actively and brought up individual ideas. Some students played the fool, humorous thinking. Students seemed to find it difficult to spontaneously think about the future.	*Free association* of future: "Wind turbine, robot, factory, fast trains, climate change, flying house, flying train, flying teacher..." *Threatening future*: "Crazy woman, murderer, bum, mafia, dead people, pestilence, very rich people, panhandler" *Preferable future*: "Flowers, parks, unpolluted sea, animals, unpolluting car, a man who donates money, fountain…"
Collective, embodied associations in different contexts:	Embodied and collective futures associations and visions about future school, home, town, forest, and preferable and disastrous futures	Enthusiasm, humour and serious thinking. Some of the collective visions were more consisting of separate individual thoughts and some were more linked within/interwoven	*Futures school:* "Robot teacher, super black board, sleeping blackboard, adhd-student, flying rubbish bin, flying piano, nuclear bomb, flying chair, servant..."
Embodied time travels to future:	Free embodied associations, imagination and storytelling	After bewilderment in the beginning, active participation and positive atmosphere	"We have transformed into giants, we destroy a city, we step on skyscrapers." "Year 12500 we are in a spaceship. We are in Jupiter. Too many humans, no space for everyone. Humans have become immortal due to new education. We just float."
Collective story-creation:	Narrative futures thinking about future threats, tensions, possible solvers and solutions.	The *orientation* of participation varied. Only about half of the class were oriented in the task properly while others oriented in social relations.	*Threats*: Pollution, rubbish, over-eating, wildfire/ rich and stupid people, War, terrorists, gangsters, murders, sun becomes larger, vulcanos *Solvers/ solutions*: People become environmentally aware, punishments, Einstein and grannies, children solve the situation and animals help

Reflection on praxis

Conducting research besides teaching and developing new practices was demanding. I was not experienced in teaching improvisation and my students were not familiar with this type of praxis. Besides, video recording took my focus and prevented my full concentration in teaching. However, the research aspect strengthened reflective practice, intensified my reflection in and on practice. Video recording and watching them offered me an extra lens and helped me to understand how the practice worked and what kind of impact my instructions had on the group. Research helped me also to distance myself from evolved challenging situations while improvisation and to understand the group dynamics that evolved.

This study brought up the problem of group dynamics[50], a typical challenge for teaching drama that was a natural phenomenon as the rules of improvisation and futures education differed remarkably from the normal rules of schooling. Even though I aimed at all the students' equal participation, the students' motivation and orientation to participate differed. My experiences of this study taught me how students' agency and equal participation are relevant, critical issues especially in devising theatre[51]. Besides, I struggled with a contradiction between different goals: as a drama educator my focus was on accepting and respecting all the ideas and visions, while from the perspective of environmental education I wished that the students' visions of preferable futures were more sustainable. I ended up integrating facts searching in the whole learning process and comparing them with the improvised futures associations and narrations in the reflection phase at the end of the project.

During and after this study I felt like a lonely pioneer and I wondered if my experiences of developing this kind of particular praxis that was not easy to implement in a school context could have any value in developing sustainability education at schools. I hesitated if my study, the practice of futures improvisation, could be used and implemented by other teachers at schools. Futures education and creating alternative, more sustainable visions of the future had been rather challenging as the following short autobiographical poem describes.

As a lonely pioneer
missing practice and visions of more sustainable realities.
Crab in theatrical improvisation practices:

[50] More about group dynamics in Toivanen & Pyykkö (2012).

[51] This led me to step on the side paths of agency and ownership, and to write articles on these issues (Lehtonen 2013; 2015). These, however, are not included in this study as they do not address central issues of climate change education. These issues of agency and ownership are so wide that I could not include them in this dissertation.

How could I promote my students' creative and critical futures visioning?
Opening my doors
becoming aware of our assumptions
and the influence of media and culture in our thinking.
Nevertheless hesitating,

What is the value of this?

Reflective findings

Futures improvisation and devising theatre practices engaged participants in thinking proactively about the future and promoted spontaneous, imaginary futures thinking. Futures improvisation practices and storytelling enabled practising spontaneous and associative futures thinking in different imaginary contexts. The spontaneity and free imagination were supported by the improvisation principles, accepting and respecting every idea and initiative. The spontaneity, lessening control were supported by embodied action like living statues or imaginary embodied time travels applied in the "Save the Future" project. These kinds of practices enabled creating collectively fictive, alternative futures scenarios, which can be used as a content for promoting reflective futures awareness.

The improvisation practices brought up interesting material of youth futures associations and preconscious images. During improvisation practices, individual ideas became related to others' ideas. One idea could inspire others' ideas. This kind of collective thinking seemed to induce humorous thinking and ideas among the group. Story-creation enabled exploring and integration of emotional aspects as well as contradictions emerging in future thinking in creation of dramatic tension. Improvisation produced situational, spontaneous thinking in a moment, which is incomplete, consists of drafts for further thinking. I did not find this purposeful for interpreting or analysing objective information, as improvisation is spontaneous and situational and is meant to emerge only for a moment. However, some major orientations were apparent and could be typified.

Futures improvisations reflected prevailing attitudes, images and media. Improvisation practices provoked fiction, surrealistic and humorous future thinking, even though the influence of the prevailing media culture was apparent in the students' future thinking. According to the participants' imagination, all the objects would be either flying or extraordinarily small or huge. They represented all kinds of things that could happen that were not possible according to the laws of physics. Several imaginative travels to the future especially reminded the teacher either of sci-fi, action or horror

movies. The participants seemed to find it difficult to think spontaneously about the future and the images of the future of the world were mainly negative. Not many realistic, sustainable images emerged among the young participants, despite the practice of imagining preferable futures.

Improvisation practices and story-creation for the performance provided a rich material for promoting reflective futures awareness of what affects our thinking and understanding of how media influences our unconscious images of the future. During the Save the Future process the collective reflections on the whole learning process were conducted especially at the end of the project. The experiences of learning and participation were reflected and collectively recalled through embodied practices of improvisation and writing. The story of the play was also compared with their knowhow about current future knowledge. In collective reflection, participants' different meaning-perspectives can meet when personal ideas can become related with other participants' ideas and reflections.

5.4 Study 4: Encounters with climate change and its psychosocial aspects through performance making with young people

Research question: *What kind of psycho-social issues emerge in performances created by youth and how are they encountered through drama?*

In the article Lehtonen, A. & Pihkala, P. (2021) "Encounters with climate change and its psychosocial aspects through performance-making with young people", psychosocial issues related to climate change were explored as they were demonstrated in performance narratives created by young participants at performance-making workshops at school conferences. Figure 8 below summarizes the pedagogical idea, praxis and reflective findings and performative syntheses that were generated during the study.

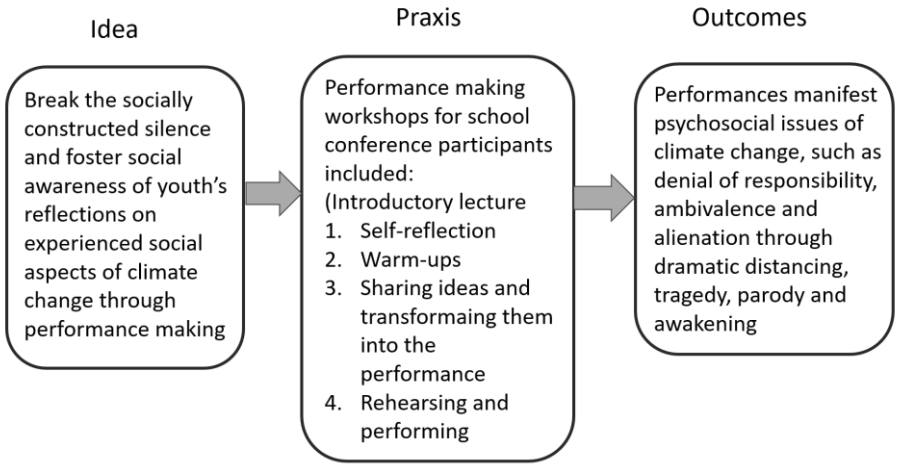

Figure 8. Idea, praxis and reflective findings of Study 4.

Pedagogical idea

The idea of the study was to try out what kind of reflections on climate change young participants would express in drama/performance workshops and how these reflections could be developed through theatrical tools and become transformed into collective performances. I expected that the participants had experiential knowing especially of the social aspects of climate change.

Praxis

The drama workshops were part of environmental school conferences that were organized in the metropolitan area of Finland between 2015 and 2017. The school conference workshops offered special occasions to reach wider audiences to try

out performance creating in climate change education with students interested in the issue. The participants in the school conference came from different schools in the metropolitan area of Finland. They were either members of schools' environmental councils or their teacher had asked them if they wanted to participate in the school conference and this specific workshop among other creative workshops.

The school conference days consisted of introductory scientific lectures about different perspectives and issues related to climate change, Youth expo or Zoo tours and creative workshops of which one was this drama workshop. When I was asked to conduct the drama workshop, I thought that this school conference offered a special setting for developing and testing short performance-making workshops for exploring young people's reflections on climate change.

The young participants of the school conference and drama workshops were volunteers. From the perspective of research ethics, permissions to participate and film the workshop and confirmation from young participants' parents were requested by their teachers at schools and collected by the organizing staff of the school conference. In addition, during the school conference day I personally confirmed from the participants whether filming and using the performance narratives for research purposes was acceptable for them. I told the participants about the voluntariness of participation both in research and performance-creating. I regarded the participants as old enough to make decisions and agreements for myself about my right to use the collectively created performance narratives for research purposes. I did not regard anonymity as an important issue in this study, because the focus was on the collective creation processes and on the final performances, not on individual responses or reflections. I did not find it meaningful to distinguish or personalize individual reflections by using pseudonyms of the collective creation, or of its processes of brainstorming, interaction and negotiation.

I told the participants about the research interests of developing methods of drama for CCE and our interest in getting their feedback and understanding their experiences. I emphasized that especially critical reflection and feedback, including the emergence of negative experiences would be very valuable. Before the workshop, I aimed to have personal contact with every participant (after the introductory lecture) and asked about their previous experiences of drama and expectations for making the performance. In addition, while creating the performance the participants were asked what kind of role they would like to have in the performance. Some participants chose to participate as technical assistants and not play a role in the final performance.

The method applied in the workshops to collectively create a performance of the ideas and thoughts brought by participants derived from devising theatre. Devising theatre aims at open-endedness, manifesting multiple perspectives and voices and uncovering attitudes, content, and experiences that may not fit into the

typical social norms of interaction and topics addressed in classrooms (Perry et al. 2013).

The idea of this study was to develop a shorter and lighter workshop version of performance making that is normally a very time-consuming and intensive project. According to my experience of study 3 and other studies (Lehtonen 2013; 2015), the more intensive performance-making projects are not simple to carry out at school and often bring up challenging issues of power and group dynamics. However, when designing this short workshop format of performance-making I was aware that this kind of short input could not have that long-lasting impact on young people's thinking or experiences compared to more intensive projects.

The principles of creating the performances in the shorter workshops originate from my own experiences of devising longer play-building projects and participation in a further education course by Riku Saastamoinen at the Theatre Academy of Finland. The design of the performance workshops originally followed guidelines of successful creative collaboration I had learned from Saastamoinen. According to the principles, in order to feel comfortable, to share ideas and collaborate there needs to be space and time for creating contact among the participants, for self-reflection and creative collaboration around the theme. These principles framed the structure of the performance workshops that resembles the theory translation mechanics in ABR by Gerber & Myers-Coffman (2017)[52] that explain how arts-based knowing evolves from personal experiences and reflection, enriched with dialogue that becomes condensed into syntheses. The workshops began with a short personal self-reflection practice, collective warm-up games, followed by dialogue besides the performance-creating process that ended with a final performance.

The *self-reflection* was done by drawing or writing about the theme of the day and what thoughts, ideas or questions had emerged. After a *warm-up game*, the rest of the three-hour workshop was used for *creating the performance narrative* based on the shared personal reflections. The collective creation was guided by the following questions: What could our performance tell about? How could the individual ideas come together? The idea and structure of the performance started to emerge when ideas were discussed and transformed into improvised action and while the participants created and chose their roles. The rest of the time was used for designing the scenes and rehearsing. At the end of the school conference days all the participants of the creative workshops presented what they had created with their participants. The audience consisted of the participants' friends, teachers and professionals of the other creative workshops in the conference Besides, the performances were commented on by specialists on the specific themes of the conference day.

[52] The translation mechanics of Gerber & Myers-Coffman (2017) are explained on page 33.

In each drama workshop there were about 7−12 participants from different schools. The age of each group varied from 12 to 16 years. As the time used for preparing the performance was only about 2.5 hours, the results were draft-like, improvised and incomplete, because there was not much time for practising or fine-tuning. The final performance scripts were written afterwards. I wrote the final performance narratives, as I as the facilitator had understood the idea of the particular scenes and performance.

The writing of the performance narratives was based on watching the videos of preparing and transcribing the final performances. I deepened my personal reflections by recalling my personal experiences of the workshops, reading the minutes and comparing it with the other data e.g. participants' self-reflection. The performance narratives were later discussed and analysed together with my co-author Panu Pihkala. Together we reflected on the final understanding of the meaning of these workshops and the final performances.

The analytical process was as follows. First, the content of the performances was thematically analysed as a whole related to theoretical literature. Second, the psychosocial dynamics and the scale of climate emotions in the performances were more carefully elaborated on and some of these were selected as ones to focus on. Third, special attention was given to the theatrical forms that were taken in the performances. Elements of tragedy and parody emerged as elementary. Fourth, these theatrical elements were more closely analysed, and it was analysed how the key psychosocial issues were manifested through the theatrical forms. The scripts and the video recordings of the performances were scrutinized many times by the researchers.

In the article we present a preparation process of one performance. In addition, some scenes of various performance scripts were selected to illustrate specific psychosocial challenges of climate change education and how theatrical forms shed light on them and make them alive. The performance narratives contained interesting and rich material for interpretation. We chose to interpret two performance narratives especially from the perspectives of eco-anxiety and the psychosocial dynamics of climate change and presented them in the article.

Reflection on praxis

During the performance workshops, I had to balance between my pedagogical responsibility of participants' learning experiences, the spectators' perspective, and research. I was interested in what kind of images and attitudes related to climate change were emerging during the workshop, but I was also pedagogically concerned about the participants' experiences during the creation process and performing, and the content and message we expressed through the performances. I wanted to facilitate collective creating thought-provoking performances. During

the workshops I was impressed by the participants' courageous, relevant, interesting reflections and positive good energy, how they were willing to talk about and perform issues not often talked or addressed at school. Content and happiness, "We made it together", were in the air after all the performances after performing. However, some critical issues emerged during the workshops and the workshop design demands further development.

During the brain- and bodystorming of one of the performance workshops[53] that is presented in the fourth article the participants expressed questionable, racist thoughts about refugees as well as about fat people being guilty of pollution and climate change. I as the facilitator had to carefully consider how to simultaneously to deal with these issues through respective discussion and manifest these issues in the performance without blaming and strengthening questionable thinking. Even though my main principle as the drama practitioner was to respect all the evolving ideas, I needed to ethically respond as the teacher to these questionable reflections among the participants. Therefore, I introduced into the discussion the aspect of rich countries' carbon footprint and our responsibility.

In other kinds of drama than performance making, without an audience, there would have been more space for expressing and working with all kinds of attitudes. At the school conference, the message communicated through the performance to the audience needed to be carefully considered, especially as there was no time for reflective discussion with the audience after watching the performance. Finally, the questionable attitudes and themes (war, world politics and over-eating) were integrated into the performance as causes of environmental destruction, but without pointing at any specific groups of people being guilty of the situation.

The main problem of the short workshop format of performance making was the lack of post-reflection with the participants or with the audience. Proper post-reflection would have been essential in performance workshops for both research and pedagogical purposes. It would have been relevant to get the participants' reflections on their experiences of performing and on the content of the final performance. Besides, reflective discussions would have been important pedagogically for clarifying the idea of the performance and for sharing the thoughts that the performances provoked and to avoid misunderstanding.

After the performances, at the end of the school-conference days, I used to just ask the participants about their primary experiences of performing and their impressions of the audience reactions. I tried out a post-reflective feedback form and audio recording the participants' thoughts and feelings at the end of the first workshops, but the participants' answers were brief and did not provide much infor-

[53] The selection of what to include in the performance occurred in interaction between me as facilitator and the participants is presented in the fourth article of this thesis.

mation about the participants' experiences. The assessment of the impact of performative approaches is not simple to conduct and needs to be considered carefully[54].

Reflective findings

Performance-making workshops seemed to serve as a creative, engaging and carnivalistic space for creatively expressing and encountering issues brought up by the participants. During the performance-making process, the essence of the collective reflection became visible and transformed into performances through improvisation, creating scenes, rehearsing and finally in performing in the presence of and for the audience. During devising praxis, the participants' ideas were not accepted or denied as such, but reflected and explored collectively through creating the performance narrative, the creation of roles, scenes and some kind of story and structure for the performance. Thus, the evolving understanding was framed by the structure of the performance.

From the perspective of environmental education, performance making seemed to work as a valuable, and student-centred approach, which allowed discussing and visualization of relevant issues that are not often addressed at schools or in the field of environmental education. Socially constructed silence around climate change, besides challenging attitudes and contradictory emotions, were apparent in the performance narratives. The examples of performance narratives presented in the article manifested psychosocial aspects of climate change. They addressed relevant issues of socially constructed silence around climate change, responsibility, indifference, powerlessness, denial and ambivalence between the rhetoric of environmental responsibility and indifferent behaviour. In addition, they posed questions about what kind of reality we want to construct together and what we could do differently.

Performance making seemed to promote noteworthy psychological processes of working together with prevailing sustainability issues and enabled exploring emerging ambivalences and other psychosocial issues together. This presumably unleashed anxiety through finding collectively creative responses to these issues as the example of performance narrative presented in the next section shows.

[54] Heras & Tàbara (2014) discuss the question of assessment in their review study on performative methods in sustainability science.

5.4.1 "Nothing matters" – performance script as a synthesis of young participants' *narrative and dramatic knowing* about responsibility, indifference and alienation

The performance *#Nothing matters* serves here as an example of narrative and dramatic knowing, a performative synthesis that was generated in the performance-making workshops. Typically for devising theatre, this performance brought up issues that are not easily discussed in normal schooling or environmental education: such as a tension between responsibility and indifference. The performance was created at the drama workshop of Ruuti Expo with young participants (age of 12−13) who seemed to be willing to speak out about issues related to climate change that are not often spoken of in normal classroom settings. These included power issues, war, refugees and ISIS, dictators, over-eating, and the dilemma between the rhetoric of sustainability education and actual, unsustainable practices at schools. Some of these issues, such as ISIS and refugees, were not directly included in the performance, but had an impact on the whole process in one way or another. Moreover, our warm-up exercise, a "follow the leader" parkour activity in the auditorium of Helsinki City Hall, which included walking on desks, seemed to provoke rebellious thoughts among the participants. The collective creation process of this specific performance is presented and explained in detail in article 4.

Before the workshop of this performance, the participants had listened to a lecture by a Greenpeace activist and toured freely around the Ruuti Youth Expo. While sharing their self-reflections, the participants discussed and asked questions about who is responsible for climate change and pollution. The final "#Nothing matters" performance manifests the phenomena of indifference and alienation as reflected and explored by theatrical tools with the participants. Power issues and a critique of adult indifference are introduced into the scene in the character of a teacher provocatively named "a wimpy Mummy's boy Forström". In contrast, the students portray themselves as rebellious by standing on tables. The teacher does not interact with her students, but stares at her mobile and communicates with her students only by using #-commands.

> TEACHER: "Good morning students!"
> STUDENTS: "Good morning teacher, Mummy's boy Forström!" the students reply while standing on their desks.
> TEACHER: "# Nature excursion!" The teacher leads the students in single file to a nature excursion by the sea.
> TEACHER: "# Lunch break. Eat Mama's packed meals,"
> STUDENTS: "Teacher, where shall we put our rubbish? Can we throw it into the sea?"
> TEACHER: "# Whatever. Do what you want," the teacher responds.
> A priest arrives to talk about the danger of littering and over-consumption.

> PRIEST: "Wake up! Act! Otherwise our planet will be destroyed," the priest declares.
> Neither the students nor the teacher pay attention to this moral point. Meanwhile, the teacher leads the students to a McDonald's fast food restaurant to eat hamburgers.
> TEACHER: "# Follow me!" "5 Big Macs, please, and five more!"
> The teacher buys hamburgers for the students and together they gulp them down and throw the rubbish all over the floor.
> The next scene consists only of sea birds screaming by a littered, polluted sea shown on the screen. That is followed by a picture of war and an explosion with smoke in the air. All the characters in the scene fall down as if they are dying. A picture of President Putin shows up on the screen. A student performing Putin drinks a last drop of vodka and dies as well.
> At the end a picture of an angel appears and a student representing the angel climbs on a desk.
> ANGEL: "What do you think about our end? How was it? What could we have done differently?"
> The students stand up and ask the audience and walk directly to the commentators of the presentation and ask:
> STUDENTS: "What could you do differently?"

The interpretation enlightens and deepens the meaning of the narrative. In study two we analysed and interpreted this performance from the theoretical frames of psychosocial issues of climate change, alienation, theatrical forms of tragedy, parody and awakening. From the perspective of CCE the performance displays the symbolic meaning of garbage as a manifestation of indifference. This performance seems to embody climate change as a social tragedy of alienation, the students following authorities to destruction. Alienation[55], not connectedness was presented as a tragedy, but presented with humour and through the parody of authorities, the teacher as not caring or present and Putin's indifference. The end of the performance exemplifies the awakening of destruction, a typical reflective phase of tragedy that Berardi (2009) calls the positive estrangement of alienation[56]. In this case the angel wakes up the students and asks what they thought about the end and the students pose the question: what could be done differently? Nevertheless, the performance narrative invites readers to engage in personal meaning making and reinterpreta

[55] For more about alienation, see section 2.2. On pages 12.

[56] For more about Berardi (2009)'s definitions of alienation and positive estrangement in section 2.2., see page 14.

6 Conclusions

The aim of this dissertation was first to promote critical pedagogical awareness essential interconnectedness in climate change education related to modern dichotomies and awareness of human and social aspects of climate change. Second, the aim was to enlighten how drama can respond to these challenges: How drama enables the promotion of a sense and awareness of interconnectedness concerning climate change education as well as generating complementary knowing related to human, future and psychosocial aspects of climate change.

In this chapter, I summarize the responses to the research questions according to the findings of studies 1−4. The responses to the question about the potential of drama is based on my experimentations of implementing drama in various CCE issues. I argue for the essentiality of awareness of interconnectedness in CCE and the value of drama as an interconnecting pedagogical approach and CCE research method. The argumentation of the value of drama is based on the examples of practice and the knowing that was generated and emerged during the drama practices of studies 2−4. In addition, I ponder and summarize what kind of specific practical knowing, skills and ethical consideration are essential when facilitating drama for CCE. I discuss the critical points of each study and how the methods applied in studies 1−4 could be further developed and used in designing futures studies. In the end, I provide concluding remarks on the meaning of drama as a mirror

.

6.1 What kind of awareness of interconnectedness is essential in climate change education and why?

As an answer to this research question, the first study reviewed literature on environmental philosophy and environmental sociology, sustainability science and environmental education in order to summarize what kind of critical awareness of problematic modern dichotomized thinking and its reflections in prevailing worldviews and education is essential. According to the literature, modern dichotomized thinking cannot provide effective responses to climate change and other sustainability issues. Dichotomized thinking seems to elevate unsustainability and alienation, therefore, an interconnected understanding of the world, humans and learning seems to be the key in promoting an understanding of and active involvement in sustainability. As a response, study 1 provides an argument how the awareness of interconnectedness and relational understanding of humanness and pedagogy are central in promoting a vital understanding of global eco-social systems and in activating individuals to develop sustainable collective responses to

sustainability crises. The principles of the pedagogy of interconnectedness (presented in study 1 on page 49−50) summarize and define the main aspects of interconnectedness in CCE.

Studies 2−4 also provide enlightened complementary aspects of interconnectedness in CCE. Study 2 emphasized the role of embodiment as the core in promoting a sense of interconnectedness and referred to relational sustainability competences (Wals 2015). Studies 3 and 4 reflect on the intertwinement of individual and social or collective thinking about future and climate change. Study 3 reflected on how futures awareness is essential in CCE, how prevailing collective futures images presumably impact on individual thinking and action, and thus our common future. Study 4 investigated understanding on the psychosocial dynamics of CC, and how issues related to eco-anxiety are socially structured and organized. Moreover, studies 2−4 all exemplify how different ways of knowing of arts and science; imagination, embodiment and cognitive understanding and reflection intertwine in drama.

Based on the findings of study 1 and the literature reviews of articles 2−4, I argue that participatory, arts-based approaches, like drama, are much needed and can have value in addressing emotional and social issues and finding creative responses to CCE collectively. Young students and their teachers in general need support in encountering prevailing dystopian futures images, in visioning more sustainable alternatives and in coping with eco-anxiety and other related psychosocial issues. Collective creative approaches are essential in addressing concerns related to psychosocial issues. Complementary arts-based tools are crucial in order to construct through education creative, personal responses to sustainability dilemmas and cultivate active identities as creative and conscious problem solvers.

6.2 How can drama promote a sense and understanding of interconnectedness and relational sustainability competences?

Particularly study 2 enlightened how drama can serve as an interconnecting pedagogical practice and research approach that can elevate relational sustainability competences (Wals 2015), such as learning to know, critique, change, be and care. The first workshop of study 2 “From the Global to the Individual” exemplified in practice how an explorative process drama can promote an understanding of the interconnectedness of human, individual, local and global aspects of climate change. According to the participants’ reflections, this extended process drama workshop provoked empathic critical awareness of how various stakeholders’ points of views differ and showed how their personal lives are related to global sustainability challenges. Moreover, this workshop 1 raised critical reflections about emerging stereotypical thinking through experience.

In addition, the second workshop of study 2 demonstrated in practice how drama could promote a sense of interconnectedness that was vital in CCE. The forest drama encouraged sensitive explorations of personal human and nature relations through embodied, collective and poetic reflective practices and creating participatory performances according to the participants' reflections. The research poem illustrated the participants' reflections how workshop 2 created an embodied sense of interconnectedness among the participants and with the forest.

During the explorative process drama workshop WS1, particularly in the role-play about an environmental conference, the participants practiced creative visioning of possible solutions. According to the participants' reflection, both workshops 1 and 2 had engaged them emotionally, had promoted caring attitudes and motivated them for action and change. Thus, particularly workshops 1 and 2 seemed to promote the relational sustainability competences defined by Wals (2015). In addition, workshop 3 study exemplified the typical interconnected − embodied, intercorporeal, empathizing and dialogical − way in which drama can reflect on issues through still image practice. During this still image practice, personal experiences and reflections become enriched and reflected with other participants' reflections through intercorporeal dialogue. Study 2 concludes that drama can promote these relational sustainability competences (Wals 2015) by offering an interconnecting space for being differently. Intensified embodied awareness and emotional engagement in creative collaboration and reflective dialogue, *being differently* in drama, seemed to promote a deeper understanding of interconnectedness of sustainability issues, raise critical awareness and motivate action.

Studies 3−4 offer more examples of how drama can promote relational sustainability competences such as elevating critical reflection and futures visioning (cf. learning to critique and change). Both the studies 3 and 4 demonstrated how drama can provide relevant material for critical social reflection on prevailing images and attitudes of futures and climate change. Study 3 illustrates how improvisation practices allow students to practice futures visioning. Futures improvisation practices generated associative and narrative material for collective reflection on prevailing images of the future. Study 4 exemplified how performance making can foster social reflection and performance narratives, manifesting psychosocial issues of indifference, responsibility, alienation and bypassing.

Based on the findings and demonstrations of studies 2−4 I argue that drama can serve as a valuable, complementary and interconnecting approach for climate change education. The findings of studies 2−4 are in line with other studies (e.g. McNaughton 2006, 2011; 2014; Rasmussen 2014; Heras & Tàbara 2014; Wall, Österlind & Fries 2019) how drama can foster relational systems thinking, and active agency through collaborative, emotionally engaging participatory learning processes. My studies, like other studies mentioned earlier, illustrate how drama

enables exploring climate change as an experienced issue and promotes participatory worldviews in which individual and social realities are intertwined.

I suggest that drama practices can provide an interconnecting pedagogic space for holistic and dialogical learning as Figure 9 illustrates. In this space, embodied, emotional, imaginative and cognitive knowing become intertwined in creative collaboration. This space allows performative inquiries around human, psychosocial and futures aspects of climate change as studies 2−4 exemplified. During the performative inquiries personal experiences and reflections come into dialogue, enriched and reflected on with other participants' experiences and various perspectives. The participatory embodied, and dialogical, imaging creative encounters with participants' perspectives and reflections promote active involvement, emotional engagement, and critical awareness and allow practicing empathy and visioning.

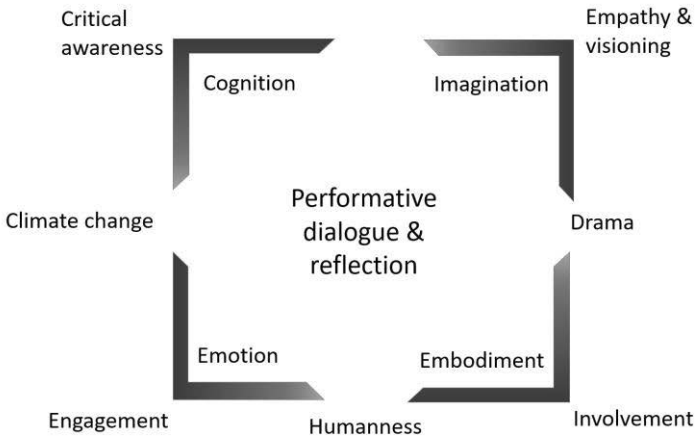

Figure 9. Interconnecting space of drama for CCE.

The pedagogical space of drama is an open, dialogical space that invites open-ended processes of performative inquiry. This space invites participants to use their imagination and to engage in the collective creation of fictive drama worlds, where anything can happen without the restrictions of reality. This encourages free imagination and the testing of alternative realities, futures and imaginary roles. Figure 9 aims to illustrate the interconnected, relational and iterative nature of knowing in drama. I hope this kind of simplification helps to understand the essence of the open ended, multilayered, relational learning situations of drama. Especially the unnamed space/gap in Figure 9 above illustrates how the performative inquiry is open and situational. The creative process, its interactions within the participants and with their learning environments lead to open- ended learning processes.

6.3 What kind of interconnected knowing and understanding can drama promote related to futures education, and human and psychosocial aspects of climate change?

Studies 2−4 provide examples of various qualities of interconnected, performative knowing that are typical for drama and relevant for CCE. These examples of knowing were generated in the practice-led processes, where knowing was encapsulated into *performative syntheses* that evolved from the interactions among the participants, facilitator and the learning environments.

(1) In study 2 the *still image practice* and two pictures of it exemplified the *embodied and reflective knowing* that emerges through self-reflection and *intercorporeal dialogue* that is typical for drama. The pictures of still image practice taken during the reflective workshop of the DESF course aimed to capture the drama education students' expressive reflections on the potential of drama for sustainability education. These pictures make visible how multiple perspectives come together in intercorporeal dialogue in drama. In the still image practice, the students were asked to create a reflective synthesis of their participation experiences and of the potential of drama in sustainability education. They put their heart and soul into it and bodily expressed their thoughts in dialogue through performing.

The first picture of still image practice illustrated how drama workshops encouraged self-reflection, connection with personal experiences and memories, critical reflection, emotional engagement and motivation to take action. The second picture manifested the value of drama in bringing people together for creative personal and collective reflection of social, human responses to sustainability issues through role taking. In addition, reflection through making and watching still images may promote crucial understanding of how we socially construct our responses to climate change and how our emotional response is socially organized (cf. Norgaard 2011; Vogel 2015).

(2) The forest workshop, its nonverbal poetry practice and the research poem, presented in study 2, are examples of *poetic* and *experiential knowing.* The poem brought into dialogue personal participation experiences in a *poetic, experiential and dialogical form* that is also typical for drama. The poem was constructed afterwards; it is an analysis and interpretation of the participants' free writings about their participation experiences in the forest drama. The poem aimed to encapsulate the participants' experiences of sensitive encounters with oneself, the forest and others. I created it as the researcher. The poem illustrates how the sense of connectedness with oneself, other participants and the forest emerged. It aims to capture the participants' experiences of interconnectedness during the workshop and how the borders between the individual and the collective, the present and memories seemed to become blurred during the forest drama workshop. The poem therefore exemplifies sensual, experiential, poetic and dialogical knowing typical for drama that might be tacit or preconscious and that might not yet be known. In

the poem, individual reflections on participation experiences become transformed into a collective dialogue like collective creation in drama. Moreover, like experiences during drama, the poem leaves spaces between the lines, it is open for reinterpretation and further meaning-making. Thus, the poem seems to work as a meaningful and functional form for captivating, bringing into a synthesis and representing participation experiences in drama.

(3) The futures improvisation practices of study 3 exemplified the *associative knowing and imaginary visioning* that drama can generate particularly through improvisation practice. Improvisation practices by their nature promoted spontaneous, contextual, imaginary and associative futures thinking. Futures improvisation practices and storytelling enabled futures thinking in different imaginary contexts and collectively created fictive, alternative futures scenarios. Spontaneity and free imagination were supported during the improvisation practices principles through accepting and respecting every idea and initiative. Spontaneity and letting go of control were supported by embodied action (particularly in living statues or imaginary embodied time travels applied in the "Save the Future" project).

The chosen improvisation practices seemed to bring up interesting material of youth's futures associations and preconscious images. As is typical for improvisation praxis this knowing was spontaneous, situational, draft-like and incomplete, emerging in a moment in a continuous process of becoming. It did not seem to be purposeful to interpret or analyse this kind of knowing when aiming at objective information in this research. However, some major orientations to the future were apparent and could be typified in the content of participants' thinking. The improvisation practices seemed to provoke fictive, surrealistic and humorous future thinking that reflected prevailing attitudes, images and media. The images of the future of the world were mainly negative. The participants expressed difficulties in thinking about the future and creating realistic, sustainable images of the future. Improvisation practice did however seem to allow rehearsals of futures visioning skills and provided interesting material for reflection and interpretation.

(4) Study 4 demonstrated in the form of performance narratives the *narrative, dramatic and performative reflections* that were created during performance-making workshops. The performance workshops (study 4) seemed to have provided a carnivalistic atmosphere, where challenging sustainability issues, attitudes, contradictions and future threats brought up by students became encountered collectively in a playful, but ethical and serious way. Performance-making workshops seemed to serve as a creative, engaging and carnivalistic space that enabled exploring, expressing and working creatively with the issues that are often neglected in education. The participants' ideas were not accepted or denied as such but were reflected and explored collectively through creating the performance narrative, the roles, the scenes, some kind of story and structure for the performance. The participants' reflections came together in dialogue and were elaborated and framed

by the structure of the performance. During the performance-making process, the essence of this multimodal, collective reflection became visible and was transformed into performances through improvisation, creating scenes, rehearsing and finally in performing before an audience. In this process factual thinking and imagination, and embodied, emotional and cognitive understanding intertwined.

The performances combined tragedy with parodic humour. The carnivalistic encounters in performance-making workshops encouraged questioning authorities through parodies that might well have been an empowering experience. The examples of performance narratives presented in the study (article 4) manifested the relevant psychosocial dynamics of climate change such as ignorance, denial, ambivalence between a rhetoric of environmental responsibility and indifferent behaviour, alienation and tragedy. In addition, the narratives included an awakening phase that questioned what kind of reality is preferable and what one could do differently. Performance workshops exemplified how contradictions, dystopian futures visions and other eco-anxiety issues related to climate change can be collectively encountered through drama: how drama allows working with prevailing images, reflection on them, unleashing the imagination to make them visible and elaborating them into performative narratives. This process helps to acknowledge contradictions and issues behind eco-anxiety and might foster resilience and constructive coping rather than maladaptive coping strategies.

This knowing: the 'results', 'conclusions' or 'findings' of performative inquiries of studies 2−4 are perhaps best understood as inherently unfinished and provisional. Nevertheless, the performative syntheses elevated interesting insights and became meaningful through reflection and interpretation from various theoretical perspectives. The knowing and the performative syntheses that studies 2−4 created, were generated through artful dialogue and the elaboration of the participants' experiences and reflection.

Through these examples of studies 2−4, I argue that drama can serve as an interconnecting pedagogical and research praxis that can generate relevant, complementary, interconnected knowing for climate change education. I suggest that the performative syntheses created through drama can be of value in increasing an understanding of issues that go beyond text. Such issues might not unfold through traditional educational research methods that often encapsulate mainly cognitive or verbal reflection. My findings are in line with the review study of Heras and Tàbara (2014), who show how performative methods of drama can have value in research communication and in fostering social awareness of sustainability issues. Performative approaches to drama can generate a complementary understanding of the (human) causes and consequences of climate change. Also, supportive experiences of dialogue and creative collaboration might elevate resilience as well

as the motivation to participate in the collective creation of more sustainable cultures. These are among the main goals of CCE (UNESCO 2015)[57]. However, there are certain limitations in applying drama to CCE and its research. Conducting drama necessitates specific skills and requires specific ethical considerations.

6.4 Specific skills needed for and ethical aspects of facilitating drama for CCE

Facilitating drama as research was rather demanding and necessitated considering several issues and taking various roles simultaneously. During the practice-led performative inquiries I as the teacher/facilitator-researcher had two overlapping focuses. First, I had to concentrate on facilitating the performative inquiries. Second, my aim was to capture and record the evolving performative syntheses[58] and the situations and processes where they evolved. In addition, I aimed to reflect and capture their meaning reflected by the participants, co-facilitators, co-researchers, assistants and myself. Afterwards my role was to interpret these enquiries in dialogue with my co-researchers and various theoretical literature. In addition, climate change is a challenging topic that demands special ethical and pedagogical sensitivity from the facilitator.

During the whole dissertation process, I have learned that specific pedagogical skills and ethical consideration are needed when implementing drama for CCE. In order to generate meaningful learning experiences that elevate deeper understanding of e.g. climate change through drama, the learning processes need to be designed carefully (Österlind 2012). Besides, facilitating drama requires specific practical knowledge of the principles and practices of drama, skills in creating an atmosphere of trust and managing group dynamics, facilitating creative collaboration, dramaturgical consideration and ethical sensitivity. When applying drama as performative inquiry the pedagogical idea and praxis need to be defined carefully together (Nicholson 2014)[59]. In addition, facilitating drama as research is complex and demands taking various roles besides facilitator, such as dramaturge, recorder, observer, interpreter, etc. (cf. Belliveau & Sinclair 2019)[60].

Because climate change is an emotionally and psychologically sensitive issue, special attention needs to be paid in creating an atmosphere of trust and respect among the participants. The facilitation of drama needs to be adjusted according

[57] See the goals of CCE defined by UNESCO (2015) on page 8-9.

[58] See the explanation of performative syntheses and the process of translation mechanics (Gerber & Myers-Coffman 2017), on the page 33.

[59] The terms pedagogical idea and praxis are explained referring to Nicholson (2014) on page 40.

[60] See Table 1 the various roles in each study on page 37.

to the needs, experiences and issues raised by the group of participants. Ambiguity, respect for various personal experiences, perspectives and individual, personal processes need to be emphasized. Moreover, climate change mitigation is sensitive to social pressure, maladaptive coping, stereotypes and splitting, i.e. black and white thinking.

The drama facilitator needs to be present and reflect on his/her practice and ethical decisions continuously (Nicholson 2014, 172). Drama teachers need to acknowledge the personal assumptions and values that the facilitator aims to promote through drama and recognize power issues in interaction to see what kind of ideas are neglected or favoured. As Biesta (2014) points out, it is critical to question what the logic of emancipation actually is.

The focus when facilitating creative collective processes needs to be on the issues that participants raise, and on the issues that participants are willing to work with. Even though the teacher-facilitator might have the 'right answers' in mind, answers to the participants' questions and issues should not be provided. On the contrary, the aim should be not-knowing and the focus on creating a supportive and respectful atmosphere and allowing space where participants can together explore and reflect on their issues from various perspectives. Ideally not-knowing is respected in the space of drama, for then questions, tensions, contradictions and creative further questions are given space and various, collective and personal creative solutions can emerge. Then the participants get the ownership[61] of drama, not the facilitator.

Studies 2 and 4 brought up critical reflection on stereotypical thinking and challenging attitudes that might emerge in drama and DESF and how they need to be considered in the design of the practice. Depending on the group of participants, climate change often also evokes challenging attitudes and maladaptive coping. Facilitators need to be prepared to encounter climate denialists and less liberal attitudes to climate change. In such cases, reflection could be focused on personal experiences and on evolving emotions and contradictions, not on personal opinions, values and attitudes. In addition, the integration of facts and information might help when encountering challenging attitudes or general misconceptions of causes and consequences related to climate change and global warming.

Ethical and pedagogical aspects are also essential when making dramaturgical decisions about the messages expressed by performing to audiences, when constructing roles and when bringing participants' ideas and suggestions together. Just making visible, acknowledging and giving space to the related challenging emotions and contradictions might help. When necessary the facilitator needs to stop misleading argumentations in order to prevent conflicts and reflect on how

[61] I have investigated the issue of ownership and agency in drama in Lehtonen (2015). However, this relevant issue was omitted from this dissertation as being too complex and wide an issue to investigate both as theory and as a phenomenon.

such tensions could be used to create dramatic tension in dramaturgy. It is essential to consider how to avoid blaming or strengthening stereotypes and promote empowerment and hope. Facilitating collective creation in drama is always navigating and balancing with different intentions, interests and drives (cf. Perry 2011; Wessels 2012). The facilitator needs to be present, listen to the group and what is in the air, and adjust to the process and needs of the participants.

To summarize, drama is ethical dialogue (Heikkinen 2016) that necessitates ethical sensitivity and reflective practice. When facilitating drama, it is essential to pay attention to creating a safe space for rich and respectful dialogue on multiple experiences and perspectives. Reflection on practice should also focus on power issues and the logic of emancipation as relevant themes of both drama and CCE. Openness and critical questioning are not inherent principles of drama, hence they need to be conscious principles and carefully considered while designing praxis. These issues are also critical qualities that should be explicitly reflected on when writing about the creative and dialogical processes of drama as research.

6.5 Reflection on studies

Several critical aspects emerged during each study and the whole dissertation process. Bringing together multiple aspects of climate change education and drama in this dissertation has necessitated making compromises and narrowing perspectives and content. It has been challenging to combine knowledge of different fields with different methodological backgrounds and criteria of knowing.

The challenge of study 1 was to construct a comprehensive picture of interconnectedness. I experienced the challenge of trying to discuss complex and immense issues on a meta-level that led to over-simplifying and restricted understanding that is a typical weakness of emancipatory critical studies as Bruno Latour (1993, 232−237) has stated. While aiming at promoting critical awareness of dichotomies that relate to unsustainability that persist in current thinking, study 1 problematically relies on dualistic terms and might give an impression of a solid theoretical construction. Hence, study 1 lacks critical reflections on incompatibility and tensions between theories and theoretical traditions. We had to select and bring together literature from different fields related to interconnectedness, such as environmental philosophy, environmental sociology, environmental education and sustainability science in a transdisciplinary study. The selected concepts and theories can be questioned. I could not review profoundly the literature of any dichotomy or the essential dimensions of interconnectedness for CCE that would have been purposeful and justified

Interconnectedness is a complex and multidimensional issue and dichotomized thinking is constructed in the language and terms used in the prevailing conceptual

thinking. Thus, it is relevant to ask if this dissertation has promoted interconnectedness or not by means of the language and terms used. Not only the central concept of interconnectedness, but also interdependence and relationality trade on a dichotomic structure, the notions of 'alienation' and 'separatedness' being its opposite poles. I acknowledge this problem, but I think that the terms interconnectedness, interdependence and separateness are nevertheless useful for becoming critically aware of the meta-level challenges of sustainability education. At the same time it is useful to be aware and wary of the fact that dichotomies do exist and persist in our meta-level thinking and language of discussions.

Selecting literature and theories e.g. ecofeminism and postcolonial theories that focus on dismantling and criticizing dichotomized thinking by creating alternative terms and expressions could have been relevant. However, in order to participate and promote a transdisciplinary dialogue around CCE, I did not want to restrict the potential discussions to the paradigms of ecofeminism, posthumanism or postmaterialism that do not use traditional academic concepts of educational sciences such as 'data', etc.

Typically for arts-based research, the processes of studies 2−4 were open-ended and fumbling. Selection of the theoretical and conceptual lenses for understanding looking at the performative processes of studies 2−4 emerged both from CCE theory and drama praxis from the themes brought up by participants. Especially in study 2, it would have been relevant to review more profoundly literature about embodiment as the basis for the interconnectedness that drama promotes and related Cartesian dualism as the origin of human alienation that results in unsustainability. Theoretical frameworks and referred theorists could have naturally been chosen differently in each study.

The concepts used in my dissertation have been selected because they are used in academic discussions in CCE or drama, and because I have found these concepts useful for describing and understanding climate change as an experienced issue. Besides being an essential aspect of arts-based research, the theories and concepts selected should allow interesting dialogues with the artistic "data". This data works on the intuitive and "beyond text" level that is challenging to capture by the traditional academic language that is typical of arts-based research. For example, the vague concept of alienation is difficult to explicitly define as a vague transdisciplinary term, but hopefully it is useful for reflecting on the experiences and the sense of lack of connections typical for the current way of being and living.

This dissertation is based on a number of experimentations of applying drama to different issues of CCE. More intensive studies with wider data would have generated more valuable and deeper insights into the value of drama in sustainability education when exploring essential human and social aspects of CCE. The drama practices chosen for studies 2−4 were simple and easy to conduct. They were more innovative as a research tool than as drama in itself. For example, the

still image practice is rather ubiquitous and not particularly inspirational. In addition, performance workshops (study 4) lacked proper post-reflection sessions. Post-reflection would have been essential in order to understand the meaning of the performances and participation experiences from the participants' perspectives. Hence, the implemented drama practices of studies 2−4 would need further development.

Studies 2−4 might give an optimistic, unrealistic impression of the potential of drama as a response to the specific challenges of CCE. However, applying drama as a pedagogical approach for CCE at school is not simple. According to research, conducting meaningful classroom drama lessons in Finnish comprehensive school settings is very challenging. Teaching drama necessitates specific skills (Toivanen, Pyykkö & Ruismäki 2011; Toivanen & Pyykkö 2012) and managing group dynamics, as the roles and norms of behaviour differ from normal schooling. In addition, realizing the declamatory curricular goals of CCE and sustainability education at schools is problematic (Saloranta 2017; Mykrä 2021).

I also struggled with the challenges of facilitating drama, e.g. the problematic group dynamics in study 3, when I conducted the long improvisation and performance-making process as a primary school teacher. Therefore, power issues could have been a relevant and critical focus in study 3, because the theme would have been significant for both fields: drama and CCE. This limitation reflects one of the drawbacks of academic articles that tend to focus on single rather than multiple perspectives. However, I am aware that group dynamics and power issues are always relevant aspects to consider in reflective practice when conducting drama.

In studies 2 or 4 that were not conducted in classroom settings, group dynamics or participation orientation were not relevant issues. The orientation or motivation was not a problem among the experienced drama students in study 2 or the voluntary, school conference participants. Besides, the experienced drama students could provide deeper as well as critical reflections on their experiences of participation.

Despite the above-mentioned critical aspects and issues that emerged during the whole research process, I consider that the dissertation process has generated relevant knowledge. The knowhow of use of drama in multidisciplinary, inquiry-based learning processes is currently called for in the current Finnish Curriculum for Basic Education. In particular, it has increased an understanding of the pedagogical meta-level challenge of CCE related to dismantling modern thinking in dichotomies and the potential of drama as a pedagogical and research praxis for CCE. The study in its entirety addressed key aspects of how arts-based methods can have value in CCE, such as questioning prevailing mindsets, addressing students' perspectives on climate change, increasing an understanding of the human aspects, fostering futures awareness and visioning. Additionally, this dissertation offers a theoretical structure for explaining the epistemology of drama as arts-based and practice-led research.

This dissertation includes experimental, pioneer studies of implementing performance making and improvisation projects to address relevant aspects of CCE in various contexts. The contexts, the type of participants, my role and position as teacher-researcher varied in each study. The second study was conducted for further education for adult drama education students. The third study illustrated how drama could be implemented in primary school practice of futures education. The fourth study demonstrated how the short workshop version of performance making could be used to explore secondary school students' perceptions of climate change as a social issue.

Even though this dissertation does not provide a complete picture of the processes of implementing drama in CCE at school context, I hope that my experimentations will inspire drama teachers and climate change educators to further experiment with these themes and practices, learning through reflective practice with drama. I hope this thesis and its examples of practice will lead to further research and other researchers trying out arts-based, performative approaches in research on CCE and wider sustainability issues.

To summarize, this dissertation has contributed 1) to several reflective aspects for developing CCE and 2) knowhow of drama as arts-based practice and practice-led research for CCE for various groups of participants and 3) how drama can serve as an interconnecting pedagogical and research approach for CCE and futures education.

6.6 Future research

I suggest that the experiential, practical, performative and conceptual, interconnected knowing that drama practices can generate can be valuable in developing both climate change education and futures education. In addition, the developed methods and the experiences gained during the whole research process can have value in future CCE research.

Drama has value as both an emancipatory and dynamic pedagogical approach and as an engaging and participatory way for research that can promote interconnected knowing of relevant issues for CCE and increase dialogue, an understanding of different perspectives and empathy within various stakeholders. Therefore, it would be meaningful to further develop these sprouts of inquiry in the future. As developing an understanding and effective practices to create alternative, more sustainable futures visions and to encounter psychosocial issues of climate change are urgently needed, I am very willing to conduct further studies where I could apply these methods and the knowhow gained during this dissertation process in the future. It would be meaningful to conduct wider studies combining the performative, dialogical, embodied and narrative methods of drama such as frozen

image technique, improvisation practices and performance making to explore psychosocial issues and futures thinking among young students more deeply. Various approaches to drama could serve intergenerational and stakeholder dialogues of socially constructed climate change/social drama around CC and socially organized climate emotions.

The performative methods of drama applied here could be used to serve the interests of providing wider 'data' on the following themes:

- Young people's and educators' emotional responses, images and reflections on climate change and psychosocial dynamics as experienced issues.
- Experienced contradictions and gaps between a rhetoric of sustainability (education) and institutional practice (e.g. teachers and students at schools) and how to overcome these gaps could be explored through e.g. performance making.
- Futures thinking, alternative visions of more sustainable schools and societies, and how drama could encourage and empower people to realize these visions.

This study also raises questions of the current praxis in which drama and other performative methods have been applied to CCE and how the learning and participation experiences could be evaluated. In addition, reflective discussions among experienced drama practitioners would be essential concerning the specific pedagogical, critical and ethical issues that often emerge when drama is used in CCE. For example, the role of and reflection on emerging stereotypical thinking in drama is an essential question that studies 2 and 4 raised. This issue is one aspect of the wider question of how to encounter and address challenging attitudes, e.g. climate denialism through drama. Based on my results, it seems possible through drama to create safe and dialogical spaces for exploring emotional and value-laden issues like eco-anxiety, but what is critical for this and how it can be created is not fully answered in this dissertation. Hence, further research is needed on critical and challenging issues of implementing drama in CCE.

Moreover, it would also be interesting to try out other tools of drama for research purposes for example Augusto Boal's various frozen image techniques and theatre of oppressed or playback theatre. These methods could generate relevant complementary knowing, embodied and narrative dialogues about climate emotions and other psychosocial issues that cannot be reached through traditional qualitative methods. In addition, playback theatre, for example, could serve as a valuable way of narrating and disseminating climate change education and mitigation as experienced issues. These methods could provide empowering experiences of expression and narrative dialogue in a supportive atmosphere to promote

empathy. In addition, decentred subjectivity, typical for drama would be a relevant theoretical theme of research related to relational pedagogue and epistemology.

In the end

During the dissertation process I have felt hat drama as a performative art can offer a valuable experiential mirror for social reflection on humanness in the reality of climate change, as Heras & Tàbara (2014) have noted and as Augusto Boal (1995, 13) writes:

> Theatre is born when the human being discovers that it can observe itself, when it discovers that, in this act of seeing, it can see itself − see itself *in situ*: see itself seeing. Observing itself, the human being perceives what it is, discovers what it is not and what it could become. It perceives where it is and where it is not, and imagines where it could go. A triad comes into being. The observing-I, the I-in-situ, and the not-I, that is the other. The human being alone possesses this faculty for self-observation in an imaginary mirror. (…) Therein resides the essence of theatre: in the human being observing itself.

The performances created with youth during the whole dissertation process offer various aspects for mirroring CCE. The performances manifested various types of agency in constructing the collective narrative of our future. In some performances the performers were singing breezly on stage "We are the world, we are the children…", while in several performances the performers were questioning current mindless ways of behaviour. Performers of #Nothing matters posed a question why we are following the careless authorities to destruction. Whereas, in a performance called "Awakening", young people experienced an epiphany in the midst of a hysteric and hectic shopping situation, something similar to a big sale like 'Black Friday' in which suddenly everything freezes and stops. Sellers wonder what happened and the young customers start to critically question their insane shopping. "Why do I need three phones? My old phone is still working ok." "Why do I need three pairs of Converse sneaks?" "My wardrobe is already full of clothes. I don't need any new clothes, I already have good, old ones."

According to Sue Wayman (2009; 95), the core question in sustainability education is:

How can we engage learners in processes that are both liberating and empowering? We need to find ways of facilitating learners' abilities to name and frame their own ideas

and concerns about the future, and their positionality and potential for change.

When applying the performative and narrative methods of drama, creative human potential can become unleashed and participants' reflections are visualized and narrated on stage.

There is light on the stage. I have felt that through drama I can elevate a sense of hope by providing a space for the challenging attitudes, questions and emotions brought up by the participants that we teachers cannot provide right answers to.

In the awakening moments of tragedies of overconsumption and alienation the audience was woken up to think and question: "What do we think about our end?" The performances called for mirroring and positive estrangement of the current alienation and seemingly indiffernt ways of behaviour. The performers (study 4) invited us to think about what kind of future we want and what we are ready to do for it. Let's imagine sustainability and experiment with it together.

The stage is ours.

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Articles	Questions	Theory and methodology	Methods, practices and data	Results
Study 1 Pedagogy of interconnectedness for encountering climate change as a wicked problem	What kind of awareness of interconnectedness is needed and why?	Literature of philosophy and sociology and environmental education research Theoretical review	Theoretical reading of problematic dichotomized thinking and vital awareness of interconnectedness in climate change education Content analyses of Climate.now -course and its pedagogical material from perspective of interconnectedness	Modern dichotomous thinking promotes unsustainability, alienation and needs to be questioned as problematic in climate change education. As a response relational view of oneself, the human and the world and holistic understanding of learning are essential in CCE. Individuals have an impact on global ecosocial reality and global ecosystems through acts, thoughts and attitudes.
Study 2 Drama in education for sustainability – becoming connected through embodiment	What kind of transformative, interconnecting, embodied learning does appear during the course Drama in Education for a Sustainable Future (DESF) and emerge in the participants' reflections?	Pedagogy of interconnectedness, IntersubjectivityRelational sustainability competences (Wals 2015).	WS1: process drama on local and global perspectives of climate change/ open questionnaires WS2: devised forest drama/ content and poetic analyses of free writings on participation experiences WS3: reflective group discussions, reflection through drama/ still images as synthesis of reflection/ content analyses	Intensified embodiment and emotional engagement in creative dialogue and collaboration, thus *being differently* in DESF enabled experiencing interconnectedness with oneself, other participants and interconnectedness of humans and nature, local and global perspectives of CC. DESF enabled experiences of human aspects, different stakeholders' perspectives to CC.
Study 3 Future thinking and learning in improvisation and a collaborative devised theatre project within primary school students	What kind of futures thinking and skills do improvisation practices and performance-making promote and how?	Futures education Aesthetic, transformative learning process (Sava 1993, Teerijoki 2001, Østern 2006)	Reflective practice during futures improvisation and devising theatre project. Theatrical futures improvisations: futures associations, sound-engines, imaginary time travels, story-telling practices. Content analyses of futures thinking.	Futures improvisations and story-creation for the devised performance enabled creating actively futures visions and narratives and promoted futures awareness. Futures improvisation promoted spontaneous, imaginary, contextual, mainly negative futures thinking that reflected prevailing attitudes, images and media.
Study 4 Encounters with climate change and its psychosocial aspects through performance-making with young people	What kind of psycho-social issues do emerge in performances created by youth and how are they encountered through drama?	Psycho-social dynamics Alienation & positive estrangement (Berardi 2009), Parody and tragedy, awakening.	Performance-making workshops (N=6) Abductive analyses and interpretation of emerging psychosocial dynamics, themes of alienation, tragedy, parody and awakenings in performance-narratives.	Prevailing socially silenced issues: denial ambivalences and alienation can be made visible and encountered serious playfully in performances through theatrical tools of parody, tragedy, estrangement and awakening