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Crafting Sustainable Development

*Studies of Teaching and Learning Craft in
Environmental and Sustainability Education*

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Abstract

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The overall aim of the thesis is to contribute with new and deepened knowledge about the teaching and learning of craft when the crafting activity is considered as environmental and sustainability education (ESE). To achieve this, three objectives have been formulated: to examine what constitutes a craft subject content relevant for ESE, to examine what influences the learning process when the crafting activity is considered as ESE, and to examine how the crafting material participates in the learning process when the crafting activity is considered as ESE. The three research objectives are addressed by four studies: one literature study (Paper I) and three case studies where the empirical data is constructed through observations (video recordings) of a remake project (Papers II and IV) and an embroidery project (Paper III) in the craft subject 'educational sloyd' in Sweden. The main theories that the thesis draws on are Tim Ingold's theory of making as a practice of correspondence and John Dewey's transactional approach to meaning-making. Several methods that acknowledge learning in action are used, which makes it possible to explore how the student-material relations emerge and how both humans and more-than-humans participate in the learning activity. The findings show that a craft activity, for example a remake project, can have different purposes and pedagogies, which produce different learning experiences and sustainability outcomes. Further, I identify and distinguish a process content from a product content, which deepens our understanding of what students learn when the crafting activity is considered as ESE. By focusing on how the student-material relations emerge in the learning process – with concepts that I use and develop such as correspondence, stories, and transactant – I empirically show how the crafting material not only participates with its materiality but also creates the embodied stories that students recognise when they encounter the crafting material in the crafting activity. How humans learn in socio-material relations and what consequences these have for ESE are two key issues that are further discussed when the crafting activity is considered as ESE.

Keywords: Environmental and sustainability education, teaching and learning craft, remake pedagogy, recycling, student-material correspondences, transactant

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To Edith and Lydia

List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

- I Hofverberg, H., Kronlid, D. O., & Östman, L. (2017). Crafting sustainability? An explorative study of craft in three countercultures as a learning path for the future. *Nordic Journal of Science and Technology Studies*, 5(2), 8–21.

I proposed the idea for the project and collected the literature. The study was designed in a collaborative process. The analysis and writing were done collaboratively but led by me.

- II Hofverberg, H., & Maivorsdotter, N. (2018). Recycling, crafting and learning – An empirical analysis of how students learn with garments and textile refuse in a school remake project, *Environmental Education Research*, 24(6), 775–790.

I proposed the idea for the project. I also designed the research, and planned and conducted the observations. The analysis was done collaboratively. In addition, I wrote the paper, with the exception of the methodology.

- III Hofverberg, H., & Kronlid, D. O. (2018). Human–material relationships in environmental and sustainability education – An empirical study of a school embroidery project, *Environmental Education Research*, 24(7), 955–968.

I proposed the idea for the project. In addition, I designed the research, and planned and conducted the observations. I also analysed the video recordings. The further analysis and writing were done collaboratively but led by me.

- IV Hofverberg, H. (submitted). Entangled threads and crafted meanings – Students’ learning for sustainability. Manuscript submitted to a special issue on new materialism, *Environmental Education Research*.

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Hanna Hofverberg
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1. Introduction

This doctoral thesis examines the teaching and learning of craft when the crafting activity is considered as Environmental and Sustainability Education (ESE).

Humans have always made things out of the materials available to them, and when we talk about historical periods (such as the Stone Age or the Bronze Age), it is clear that they are often defined by a material. However, our current age is not defined on the basis of a material, but rather it refers to the ‘expansion of mankind’ (Crutzen & Stoermer, 2000). Accordingly, the term ‘Anthropocene’ has gradually gained acceptance as defining our current epoch, and it dates from approximately the end of 18th century until today (Johnson & Morehouse, 2014). Steffen, Broadgate, Deutsch, Gaffney and Ludwig (2015, p. 82) argue that a dramatic change – described as the ‘Great Acceleration’ – has further been taking place in the magnitude and the rate at which humans have impacted the planet negatively from around 1950 onwards. Therefore, humans need to re-orientate their actions towards more environmental and sustainable development, for example, in how humans use materials. But conflicts easily arise when we move to the questions of what the best strategies are for a more sustainable development and how making and crafting can be part of a sustainable development. One common suggestion is called ‘ecological modernisation’, which aims to reconstruct and readapt economic growth by incorporating environmental and sustainability concerns (Hajer, 1995, p. 26). Dryzek (1997) contends that ‘ecological modernization is about the search for green production technology, and especially clean energy’ (p. 145). However, ecological modernisation has been subject to criticism because, as Dryzek explains, ‘the word “modernisation”, like the word “development”, connotes progress’ (p. 175) and progress is not a self-evident way forward for a sustainable society (cf. Jickling, 1992). But this is not the only critique put forward. In the last decades, there has been growing criticism in the social sciences and the humanities about the neglect of materials, with an emphasis on how matter *matters* (Barad, 2003). This critique stems from what can be defined as the turn to materiality in research (Cole & Frost, 2010), which is concerned with decentralising the human subject among materials (Fenwick, 2015; Sørensen, 2009). To take the neglect of materials seriously, Taylor (2017) argues that

there is a call ‘for a paradigm shift in thinking about what it means to be human, what we mean by the natural environment, and about our place and agency in the world’ (p. 2). Further, one of the reasons for this concern for materiality is due to environmental crises, such as climate change. Bryant (2014) argues that

thinking climate change requires thinking ecologically and thinking ecologically requires us to think how we are both embedded in a broader natural world and how non-human things have power and efficacy of their own. (p. 4)

These calls for the reorientation of how humans act and learn to live (in the Anthropocene) can be quite challenging because sustainable development can no longer be only about oneself. Resources are not endless, and thus, reorientations are needed if we are to create a more sustainable future – but how? One answer is through education, in particular, through education for sustainable development (ESD).

As a policy term, ESD’s mission is to educate for a better and more sustainable world. The concept of ‘sustainable development’ was introduced by the UN General Assembly in 1987 as a way to vision a sustainable future. It is defined as development that embraces the needs of the present generation without compromising those of future generations (WCED, 1988). In the vision for sustainable development, three dimensions are present – the social, the ecological, and the economic. Since the concept of sustainable development was introduced, ESD has increasingly informed the agendas of global educational policy. For example, the ‘United Nations Decade’ (2005–2015) on ESD helped spread international awareness of the demands of ESD. Today, the United Nations’ 17 sustainable development goals, also known as Transforming Our World: The 2030 Agenda of Sustainable Development, have a strong focus on education, particularly goals 4 and 4.7 (UN, 2015). These policy examples invite, and to some extent also demand, the use of quality education as a means to create a better and more sustainable future. Therefore, to realise the vision of sustainable development, education is argued to be a key agent. But one question arises, namely, what should education educate for in order to achieve sustainable development? That is, what is its purpose, and what is the desired outcome? Moreover, how is such an education achieved if human subjects are not the only actors but rather are placed among materials? These questions are highly relevant to the thesis. However, before I elaborate on the thesis’ aim and the objectives, it is useful to describe some of its key terms: ESE, ESD, more-than-human/s, craft, and how crafting relates to education in the thesis.

In the thesis, the acronym ESE is used when educational matters address issues relating to the environment and sustainability. As stated, ESE stands for environmental and sustainability education. In the thesis, ESE research refers to the research related to ESE. ESE as a term, does not determine or indicate a normative solution, such as what ESE *is* or, for instance, when educating *for* sustainable development. The acronym ESD, as stated, stands for education for sustainable development. The term is used as a policy term, for example, when the Swedish curriculum states that the teaching and learning should give opportunities for students to learn to promote sustainable development, as in, educating for sustainable development.¹

The correct term for defining all the things that matter that are not human has been the target of scholarly discussion. A core issue in the discussion is how to convey a relation which is not positioned as superior to human action or not dialectically define other living creature in opposition to the human (Lloro-Bidart, 2017). Hinchliffe, Kearnes, Degen and Whatmore (2005) argue that ‘one quick reply is to say that the word “nonhuman” recalls difference in a world that is too frequently imagined to be acted upon rather than acted from within’ (p. 644). But, as the authors continue to argue, the term ‘nonhuman’ signals a worldliness of worlds and use it to acknowledge that cultures and societies are shaped by more than human geographies (i.e. human space and place), which shows that the term issue is not a simple matter. Nevertheless, in the thesis, I have chosen to use the term more-than-human/s as the term is compatible with the theories I use – as in, theories contending that humans do not act upon but rather from within. I use the term more-than-human/s when, regarding teaching and learning activities, I discuss or highlight all the things that matter in the crafting activity that are not human, such as the crafting material.

Regarding craft, there are different ways to think about and define crafting. Adamson (2007, p. 3) explains that craft can refer to a category, an object, an idea or a process. As I am interested in the teaching and learning of the activity of crafting, I subscribe to Adamson’s definition of craft as a process and define craft as skilled hands making products with materials. Thus, to learn crafting is an embodied activity where products are made with materials. To scope the research topic further, I am interested in crafting in the context of education (which means that the activity of crafting has a specific purpose), and specifically (but not exclusively), in crafting with fabrics or yarn. Embracing crafting as a subject in an educational setting makes my research didactical,

¹ For a discussion of the research field’s terminology and an overview regarding the roots and emergence of ESE and ESE research, see Östman (Ed.) (2003); Somerville (2016); Van Poeck and Lysgaard (2016). Further, it should also be noted that the term ESD is used in Paper I in place of ESE.

which refers to the Scandinavian and German academic discipline, Didaktik (and should not be understood as it is used in English, which relates to an instructional method of teaching). A didactical perspective of craft outlined in the thesis means that the focus is on the teaching and learning of craft in relation to a specific purpose, in this case, when the crafting activity is considered as ESE (cf. Jakobsson, Lundegård & Wickman [Eds.], 2014).

In the United States and in Great Britain, crafting as a learning activity in schools has developed into technology education (Whittaker, 2014), whereas in the Nordic countries, craft education is still a mandatory subject.² The Swedish handicraft subject, educational sloyd, is of particular interest for the thesis, as the subject contains the thesis' three concerns: education, crafting, and materials (such as yarn and fabrics). In the latest curriculum from 2011, from the Swedish National Agency for Education (SNAE), one can read in the section about educational sloyd that 'the syllabus also aims to a greater extent than in the former one, to emphasize how knowledge of materials and recycling is a contribution to students' awareness of the sustainable society' (SNAE, 2011a, p. 6 *my translation*). Further, the curriculum of educational sloyd stipulates that students should be given 'opportunities to develop knowledge of how to choose and handle materials in order to promote sustainable development' (SNAE 2011b, p. 203). These statements highlight the importance of teaching and learning with materials in crafting and recycling activities. Therefore, it is safe to say that learning with materials is important when the crafting activity is considered as ESE. Yet, we still know little about how it is important. To learn more about this, we need to know what could be a possible teaching and learning craft content, and further, what influences the learning process when the crafting activity is considered as ESE.

² Although the craft subject exists in all five Nordic countries, the subject has areas of differing foci which, for example, are visible in the subject's name. In Finland, it is called 'educational sloyd' (*kästiyö*). In Norway, the craft subject is called 'art and handicraft' (*kunst och håndverk*). In Iceland, it is called 'design and handicraft' (*hönnun og smíði*), and in Denmark, craft is found in the subject 'handicraft and design' (*håndværk og design*). For further reading, see Borg (2001); Frohagen (2016).

1.1 Aim, objectives and outline of the thesis

The overall aim of the thesis is to contribute with new and deepened knowledge about the teaching and learning of craft when the crafting activity is considered as ESE. To achieve this aim, three objectives have been formulated. These objectives are

- to examine what constitutes a craft subject content relevant for ESE,
- to examine what influences the learning process when the crafting activity is considered as ESE, and
- to examine how the crafting material participates in the learning process when the crafting activity is considered as ESE.

The three research objectives are addressed by four studies, one literature study, and three case studies of crafting activities, which are outlined in four papers:

Paper I contributes to the first objective by providing insight into what a crafting content can be when the activity is considered as ESE, and it does so by exploring the activity of craft in three countercultures (from 1900, 1968 and 2017). To examine a crafting content, the paper explores (through literature) the purpose of crafting in the counterculture movements, the desired skills required to achieve the purpose, and the approaches to learning that emerge from the purposes and desired skills. The findings from Paper I provide a more general understanding of what a content can be when the activity of crafting has a sustainability focus. In other words, the findings serve as a backdrop or point of reference for what a craft subject content may be when the crafting activity is considered as ESE in formal education.

Paper II examines how students learn with garments and textile refuse when engaging in a remake project. The paper contributes to the first objective – what constitutes a craft subject content – and also to the second objective, as the paper examines what it is that influences the learning process in the remake project. To some extent, Paper II also contributes to the third objective by exploring how the crafting material participates in the learning process of the remake project.

In Paper III, the question is raised of how the material participates in the learning process of craft, as ESE is elaborated in detail by centring on the crafting material's participation. This paper is an empirical study following an embroidery thread's participation as students are learning to make embroideries. Thus, the paper also contributes to the third objective.

And the final paper, Paper IV, contributes to both the second and the third objectives, as it explores the significance of students' encounters with materiality in general and crafting materials in particular. The contributions are made by using a research approach that can show what students and the material do in correspondence in the crafting activity and what sustainability stories emerge from this activity.

The thesis is organised as follows: chapter 2 presents relevant previous research regarding a craft content relevant for ESE and what influences the crafting learning process when crafting is considered as an activity of ESE. The chapter draws on research from ESE research, craft education research, and to some extent, also design education research. Chapter 3 presents the theories of the thesis and how they are used in each paper. Chapter 4 presents the methodology of the thesis, that is, the empirical data, research context, analytical method, analytical process, and ethical considerations. Chapter 5 presents critical considerations of the thesis' theories and methodologies, which aims to show self-reflexivity and the transparency of the research procedure. Together, chapters 3–5 provide a theoretical and methodological basis of the thesis. Chapter 6 presents a summary of the results of each paper. In chapter 7, a synthesis of the findings is presented, and I discuss the findings in relation to previous research. By drawing on the findings, I also suggest areas of future research. Lastly, chapter 8 presents a summary of the thesis in Swedish.

2. Previous research

The search for relevant research began with a comprehensive digital browser search for craft-related papers in certain peer-reviewed ESE journals³ and in the *International handbook of Research on Environmental Education* (Stevenson, Broady, Dillon & Wals, 2013). In the search process, research papers that include the word ‘craft’ were selected. It became clear that crafting is seldom explored in the journals and the handbook, with two exceptions: when craft is argued to connect with the land in outdoor education (MacEachren, 2000) and when craft is used as a metaphor in ESE research. From the digital search, it was clear that craft activities exist in ESE, for example, in placed-based education (Takano, Higgins & McLaughlin, 2009), in indigenous knowledge systems (IKS) (Lloyd & Gray, 2014; Zazu, 2011; Shava, Krasny, Tidball, Keith & Zazu 2010), or when ‘recycling rubbish for art/craft’ as a form of education for sustainability (EfS) (Lewis, Baudains, & Mansfield, 2009, p. 48). But even though craft is mentioned in these examples, it is not developed or discussed further. Therefore, to continue the search for relevant research, a second digital browser search was conducted using the database search engines, *ERIC* and *Academic Search Elite*. From this second search, I identified five craft journals that are particularly relevant for the thesis: *Techne*, *Modern Journal of Craft*, *FormAkademisk – Research Journal of Design and Design Education*, *craft + design enquiry* and *Studies in Material Thinking*. As I searched these journals, I found more relevant research for the thesis.

In addition to the two digital database searches, relevant research was also gathered during the years of my doctoral studies as I attended conferences, took part in international research networks, and completed doctoral courses

³ The digital browser search included 7 peer-reviewed journals: (1) *Australian Journal of Environmental Education*, (2) *Australian Journal of outdoor education*, (3) *Canadian Journal of Environmental Education*, (4) *Environmental Education Research*, (5) *Journal of Environmental Education*, (6) *Journal of Sustainability Education*, and (7) *Southern African Journal of Environmental Education*. The journals were chosen because they all have a prominent role in the field of ESE, and as well as addressing education, they address environmental and/or sustainability issues. There was no timespan for the digital database search, but the search was limited due to the journals’ online access. The first digital browser search was conducted in spring, 2015, and a supplementary search was made in spring, 2018.

in ESE and craft. Additional research was also identified through the review processes of my papers. Through these additional channels, specific topics dealing with recycling activities and more-than-human relations in educational activities have also emerged as relevant for the thesis.

In presenting relevant research for the thesis, I have organised the research in two major subchapters. The first subchapter (2.1) presents research that focuses on craft content, and the second subchapter (2.2) presents research that focuses on what influences the learning process in crafting and ESE.

2.1 Research on craft content relevant for ESE

2.1.1 The content of crafting when considered valuable for the future, for participating in society, or for ESE

In research of craft education in the Nordic countries, there is a discussion about what skills are needed for the future – with a particular focus on what the content of craft education needs to address. Veeber, Syrjäläinen and Lind (2015), for example, situate their theoretical paper in the understanding that education needs to ‘answer the current and future needs of young people who are facing the unavoidable challenge of growing up’ (p. 15). By drawing on diverse theories, the authors argue that learning and practising craft-making supports the emergence of coping strategies, which, they further argue, are ‘useful later on and transferable to other areas of life’ (p. 25). In line with this, they explain that

craft is a natural response to children’s need to grow, offering a balanced way of getting to know the world and one’s role in it by promoting motor and cognitive development. Additionally, craft-making makes unique demands on one’s being, and therefore invites the young to create and recreate their subjectivity. Craft allows adolescents to experience the world through their hands and actions, to experience slowness, being in a process and enjoying it, ‘losing’ oneself in the material, getting excited about design possibilities, and expressing oneself through making something. (p. 25)

The authors thus claim that learning craft promotes different types of personal development skills. According to the authors, craft also encourages one to experience slowness, to enjoy being in a process, to ‘lose’ oneself in the material, and to feel excited about design possibilities. Further, the authors conclude that crafting is not only part of a productivity process that provides essential skills for the economy, but also, and more importantly, crafting is looked upon as a means to having satisfying work and thus a satisfying life. According to Veeber, Syrjäläinen and Lind (2015), these skills that crafting enables are valuable in an ever-changing society, and thus, the skills involved

in personal development and the ability to cope with a changing society constitute a content.

Lepistö and Lindfors' (2015) research findings are similar to those of Veeber, Syrjäläinen and Lind, in regard to the study of student teachers' understanding of why craft is needed as a school subject in Finland. This research is relevant for the thesis, as it shows what content could be of value for future craft education as well as what function the learning content could have. Based on the analysis of essays written by student teachers of craft, Lepistö and Lindfors (2015) found five purposes of craft education. The first purpose is, according to the student teachers' views, to enable holistic understandings. In order for holistic understanding to be learnt, the student teachers expressed that 'space for the students' planning, responsibility, and freedom is required in the craft lessons' (p. 9). The second purpose of craft education is what the authors define as 'reflective action readiness'. This knowledge provides 'hands-on doing [that] helps students to apply their understanding and knowledge to everyday activities' (p. 10), and further, a holistic understanding of hands-on doing that can develop 'the maker's ability to make independent decisions as well as to identify and apply relevant information' (p. 10.). The third purpose of craft education is to create entrepreneurial behaviour, which the student teachers emphasised requires that 'students should be allowed to decide what they are taught in crafts instead of being passive recipients of the information delivered by the teacher' (p. 11). In addition, the fourth purpose of craft education is that, according to the student teachers, crafting fosters what Lepistö and Lindfors define as versatile skills and multi-materiality (p. 12). The argument for this fourth purpose is that 'holistic craft should include all kinds of materials and techniques' and thus, the students emphasised breaking the traditional conceptions and boundaries of craft making (i.e. with educational sloyd's heritage of a gendered subject). The fifth and final purpose of craft education is to promote the joy of crafting, which the student teachers emphasised 'has a positive influence on his/her brain' (p. 13). In particular, some students wrote in their essays that 'teachers should also understand that instead of learning skills perfectly, the joy of working with one's hands should be the most important achievement in the learning of craft' (p. 13.). To summarise these findings, holistic craft, reflective action readiness, entrepreneurial behaviour, multiple skills using a variety of materials, and craft as a source of pleasure comprise the content when the craft subject is considered for the future.

Lutnæs and Fallingen (2017) come to a similar conclusion regarding the relation of a craft content and students' development. In their theoretical paper they argue that the Norwegian school subject, craft and handiwork, has strong connections to learning about sustainable development. In particular, they argue for the link between eco-literacy and specific qualities that the subject

of craft and handiwork provides, such as practical knowledge, aesthetic experiences, the responsible development of products, and critical reflection. Accordingly, the research focus is on the individuals' learning and what students learn through craft that is argued to be valuable for the future.

A core issue in ESE is the agency of the learners, namely, that education should help students take action on environmental and sustainability issues (Stevenson, Broady, Dillon & Wals, 2013, p. 2). The findings of educational sloyd research (Veeber, Syrjäläinen & Lind, 2015; Lepistö & Lindfors, 2015; Lutnæs & Fallingen, 2017) underscore, for example, the importance of being able to adapt to a changing world, independently make decisions, and take action in different tasks in line with ESE, particularly in regard to the agency of learners. Accordingly, crafting in educational sloyd seems promising as an activity for ESE. However, there is also research that critically discusses learners' agency, particularly in relation to creativity; for example, Lutnæs (2015) examines the scientific discourse on creativity in the field of design education, and more specifically, discusses the creativity that empowers citizens to promote sustainability and meet global challenges. In cultivating responsible creativity, Lutnæs argues that teachers have to consider the ethical potential when choosing the problems that different designs generate. Further, Lutnæs argues that it makes 'a vast difference whether students are asked to design desirable products to increase sales or to design useful, lasting products to improve quality of life or to mitigate pollution' (p. 11). Following Lutnæs' argument, that which is considered suitable creativity cannot be separated from a project's purpose.

Another critical exploration related to creativity in design education is Boehnert's (2015) research, which presents a theoretical introduction to what she defines as ecological literacy for design education. She describes six ecological principles (networks, nested systems, cycles, flows, development and dynamic balance) along with associated design concepts (resilience, epistemological awareness, a circular economy, energy literacy, emergence and the ecological footprint). Boehnert explains that contradictions exist within the teaching and learning content for design education when addressed as critical ecological literacy; for example, 'while some new design approaches are systemic, many continue to lack a critical approach to issues of power' (p. 7), which she claims 'continue to prioritize profitable activities over those that are ecologically sustainable' (p.7). Boehnert also argues that ecologically literate design must confront cultural traditions, development frameworks and powerful interests, as 'the contradiction of infinite economic growth within the context of a planet with finite ecological resources is increasingly recognized as a root cause of ecological crisis conditions' (p. 7). Accordingly, Boehnert argues for a critical perspective to become part of

creativity in design education, which can illuminate the contradictions of economic growth, cultural traditions, and finite resources.

Lutnæs' (2015) and Boehnert's (2015) arguments relate to how education as well as what is learnt are related to a wider social and environmental environment, which is something craft researchers like von Busch (2013) and Sennett (2008) also emphasise. For example, von Busch (2013) refers to the saying, 'If you can't open it, you don't own it' (p.143) and argues that knowing craft enables the capability of self-reliance and that 'there is a desire to reclaim and expand the room for personal engagement with our everyday objects and culture and not be left "interpassive"' (p. 143). In particular, he argues that crafting is not a do-it-yourself (DIY) ethos but rather do-it-together (DIT), if one takes 'a more strategic perspective on craft, to look at how it forms a bigger social strength, shared by many as a collaborative endeavour of "what one can do and be"' (p. 145). This falls in line with Sennett's (2008) argument that craftsmanship is a way to take part in society. When comparing craftsmanship and craft knowledge with an open source system such as the computer operating system, Linux, where everyone can take part, Sennett states that:

When practice is organized as a means to a fixed end, then the problems of the closed systems reappears; the person in training will meet a fixed target but won't progress further. The open relationship between problem solving and problem finding, as in Linux work, builds and expands skills, but this can't be a one-off event. Skill opens up in this way only because the rhythm of solving and opening up occurs again and again. (p. 38)

Thus, the process of learning and knowing craft, as interpreted by Sennett in this quotation, has constant 'problem solving and problem finding' features.

Learning craft as a way to take part in society is acknowledged by Koch's (2012) research of 'craftivism', where craft is used as a form of activism (i.e. craft + activism). Koch interviewed craftivism practitioners, and based on her findings, she argues that craftivism is a way to take part in a community. That is, by knitting in and ornamenting public spaces with colourful knitted items and embroideries, they include political messages in public spaces. In particular, she found that the participants thought of craftivism as a movement that can create joy, change the world's perception of sustainability, and feminise public spaces (pp. 229–232). Thus, through crafting activities such as knitting and embroidering, the content here is that of practising a form of citizenship (cf. Orton-Johnson, 2014).

According to MacEachren (2000), crafting is also a way to take part in one's wider environment. In her research, based on her personal experience, craft

curricula, and a collection of crafting narrations, she claims that, by learning crafting, students increase their awareness of the land through the ‘interchanges that go on between the earth’s flesh or material’s physicality and our own flesh or body’s physicality’ (p. 190), and therefore, according to MacEachren, craft is essential to environmental education (EE). Through crafting, MacEachren continues, the person learns to attend to, listen to, learn from, and play with the land. Thus, the content that becomes relevant to acknowledge is how the students in the crafting activity create relations to the crafting material in the learning activity. With this specific craft content, where students create relations to the crafting material, MacEachren explains that crafting activities are recognised as a way of engaging and interacting with the environment, which in turn, may encourage a sense of reciprocity with oneself and ultimately a relationship with the land. Thus, according to MacEachren, the purpose of learning craft is to reconnect with ‘the natural world’, which we supposedly have lost connection with.

To summarise, previous research focuses on individuals’ learning and what students learn through craft that is argued to be valuable for the future (Lepistö & Lindfors, 2015, Lutnæs & Fallingen, 2017; Veeber, Syrjäläinen, & Lind, 2015). Previous research also finds that the purpose of a crafting activity is important to acknowledge (Lutnæs, 2015), particularly in terms of how it connects to wider environmental and sustainability issues, for example, learning as a responsible creativity content (Boehnert, 2015) with a do-it-together ethos (Busch, 2013), as a way to take part in society (Sennett, 2008; Koch, 2012), or as a way to reconnect with nature (MacEachren, 2000). Drawing on this research, it is possible to conclude that crafting as an activity is shown to be relevant for ESE and that there have been attempts to determine which crafting contents are important for the future. However, teaching and learning activities when the activity is considered as ESE are seldom researched empirically in action. This gap in the research, consequently motivates empirical studies of crafting activities that can complement and deepen the subject.

2.1.2 Recycling and remaking as a crafting content

Another content when the activity of crafting is considered as ESE is remaking activities. Since the Second World War, waste production has increased dramatically in western societies, and as a response to this increase, the Agenda 21 declaration endorses recycling activities (Gandy, 1994). The standard way of thinking about learning about recycling is in regard to how it promotes environmental and sustainable actions, such as improving resource efficiency in terms of the reduction and reuse of waste and changes in unsustainable consumer patterns (UNCED, 1992). Yet, ESE research shows that teaching and learning about and with recycling activities is not a simple

matter. In Glažar, Vrtačnik and Bačnik's (1998) study, students did not understand why they recycled, and as Malandrakis (2008) points out, students also did not understand the dangers of hazardous household items. When Rioux and Pasquier (2013) carried out a three-year longitudinal study of an awareness-raising campaign regarding the recycling of used batteries in France, they found that stabilising the children's behaviour was emphasised more than teaching them how to adopt sustainable pro-environmental behaviour. Therefore, it is clear from these ESE research examples that students do not necessarily adopt pro-environmental behaviours. Another perspective on teaching and learning about recycling is that different cultures relate differently to recycling. For example, according to Crociata and Mattoscio (2015), cultural factors associated with the predictors and enablers of recycling behaviours are important to consider. Further, Gandy (1994, p. 2) argues that recycling as a concept is a symbol of the culture of consumerism. In a society that lacks a consumer culture, the way in which waste is constituted in a consumer culture may not be applicable; in such a case, there would be no need for recycling activities. Accordingly, one can argue that how waste is constituted has consequences for how the teaching and learning is carried out.

Nevertheless, a common teaching and learning recycling activity in education is to allow students to make new things out of refuse, waste or old garments. This teaching and learning activity is often called 'creative remaking' or 'upcycling' and is considered to promote sustainable behaviour. One such project called 'recycling rubbish for art/craft' (Lewis, Baudains & Mansfield, 2009, p. 48) is mentioned as an education for sustainability (EFS) project in an Australian setting. Another example is from Denmark, where Danish scholars studied waste activities in ESE and found that teachers use 'artistic activities as an entry point for dealing with waste' (Jørgensen, Madsen & Læssøe, 2018, p. 810). Some of the interviewed Danish teachers emphasised that working with reusable materials supports children's fantasy, ingenuity and creativity and further that

reusable materials do not offer predefined activities and play, but rather stimulate children's curiosity, invite playful approaches and strengthen children's ownership of the toys which they participate in making. (p. 811)

Based on these findings, Jørgensen, Madsen and Læssøe argue that by using waste in creative activities, the activity provides an opportunity to think about the future. In particular, as one of the teachers expressed, 'everything has the right to become something different' (p. 811), which thus, as the authors argue, opens up for future imaginaries that are linked to material existences. A third example is with Odegard (2012), who studied how preschool children encounter junk materials in remaking activities by using focus group

conversations with preschool teachers. In the group conversation, the teachers contributed with pedagogical documentation such as photos and texts. Based on the findings, Odegard argues that when materials have been

saved from the garbage bin, recycled materials seem to have lost their function, which in turn seems to appeal to children's creativity and make them collaborate and construct in numerous ways. (p. 387)

She concludes that when the children encounter the materials, they are 'undefined' materials, which opens up for 'an articulation that emphasises their properties rather than their uses' (p. 387). Another result that Odegard found is how children work with the material depends on how the teacher acts and confronts their own attitudes and expectations of the actual situation. For example, Odegard explains that teachers' expectations of an upcoming product affected the teaching and learning content, and these expectations were expressed through the teachers' body language and actions as well as through the questions the teachers asked.

To conclude, recycling and dealing with waste is an important environmental and sustainability issue, and one educational way to deal with waste is through arts and crafts activities (Jørgensen, Madsen & Læssøe, 2018; Odegard, 2012). Research shows that artistic activities with waste can support children's fantasy, ingenuity and creativity (Jørgensen, Madsen & Læssøe, 2018). It also shows how the material's properties guide the remaking process, and how the teacher influences the teaching and learning content by, for example, expecting a remade product (Odegard, 2012). Nevertheless, the empirical research is quite limited, which motivates further empirical research.

2.2 What influences the learning process

2.2.1 What influences the learning process in crafting

Borg's (2008) research claims that the purpose of a craft activity is important, and she illustrates how purposes have changed in the craft subject, educational sloyd in Sweden. Borg (2008) takes the so-called 'sloyd bag', which is a simple bag made of cotton fabric, and shows how the same teaching content – crafting a bag – has had different purposes throughout the history of educational sloyd. First, when the subject was created in the beginning of the 20th century, the aim of crafting the bag was to develop care and diligence. Around the 1920s, the purpose shifted towards the development of handicrafts, which meant that students had to make samples before they sewed their bags. During the 1980s, the purpose was to learn how to use a sewing machine; and in the 1990s, the bag gradually gained a more individualistic character and thus the aim was to personalise it. Borg shows how making a

bag has had many different purposes, from developing care and diligence to developing personal creativity. What this shows is that it is not only the actual crafting activity that is important but also the activity in relation to a specific purpose. Therefore, the purpose of the activity has to be taken into account in order to understand the role and content of crafting when the activity is considered as ESE.

In a crafting process, Rönkkö and Lepistö (2016) researched students' decision-making by conducting interviews with eight 13-year-old students. Their findings show that students' personal goals, self-confidence and previous experiences are influencing students' decision-making. The authors also argue that there is a connection between the students' decision-making and the social environment when the students want to emphasise their personality or similarity to their peers. These results are similar to Johansson (2002), who, through observations, found that, among other things, learning crafting in the educational sloyd classroom constitutes a social practice where students make meaning with peers, tools, through their bodies, imaginaries, and with materials. These findings are important in relation to what influences the learning process, as the findings, in a detailed way, qualify what causes students to act and continue their crafting process. However, what influences the learning process is also affected by the craft teachers' various strategies, which is what Hasselskog (2010) examines in his research. In particular, Hasselskog identifies four strategies, namely by taking on the roles of serviceman, instructor, supervisor and educator and, as he argues, these strategies are important for what the students are likely to learn. In addition, in regard to how teachers influence the learning process, Jeansson (2017) shows in her research that teachers' beliefs and perceptions about the subject will influence their interpretation of the syllabus, for example, not only in a detail interpretation of the syllabus but also from an interpretation that is to a larger extent based on handicraft knowledge.

Thus, in accordance with the mentioned research, certain factors influence the learning process: (1) the purpose of the activity, (2) the purpose of the students, (3) the student's previous experiences, (4) the social context, for example, interactions with peers, and (5) the teacher's strategies, as in, her or his pedagogy or in her or his interpretation of the syllabus.

Some researchers emphasise how the body participates as a knowledge producer in craft education. For example, based on observations from teacher education shop classes, Ekström (2012) found that the action of crafting is shown and established through bodily instructions. In addition, Frohagen (2016) examined forms of knowledge created in educational sloyd learning processes and claims that 'the articulation of craft knowledge' and 'craft literacy' are embodied interactions with materials and tools in specific ways.

Similarly, Andersson and Johansson (2017) argue that in the learning activity, the use of body language, among other aspects, plays an important role in developing an understanding of what it means to be handy, dexterous and skillful. Furthermore, according to Borg (2001), bodily experiences are memorised. In her research, she discovered that, after a long period of time after learning educational sloyd and working on a educational sloyd project, students could still recall what they saw, smelled, heard or felt with their hands. According to Westerlund (2015), emotions also emerge in the teaching and learning activity of craft. In her research, she shows that teaching and learning craft involve both pleasurable and unpleasurable emotions. These emotions affect the students' processes and the outcome of the crafted products, and thus, the embodied experience of experiencing something pleasurable or unpleasurable are important in relation to the outcome of the teaching and learning content. One last research example of how the body is present in learning crafting in educational sloyd is Andersson, Garrison and Östman's (2018) research that shows, through crafting analyses, how learning crafting 'moves from an instrumental learning of a body technique to an artistic expression through a body technique and through the material worked with' (p. 109). By making this connection, the authors show that the learning of body techniques and artistic expressions enable 'the formation and transformation of the self' (p. 109).

Thus, what this research shows is that it is not only the students' earlier intellectual experiences that matter but also their bodily experiences – how the body remembers – and through body techniques and artistic expressions, students are transformed. Thus, the learning outcome is not solely an intellectual outcome but also an embodied outcome.

Regarding this embodied outcome (i.e. a student's embodied experience when learning to craft), Illum (2006) examines how the students encounter the material, which he defines as dialogue in process. For example, a student focusing on a nail encountering wood material is described as a dialogue between the student and the material. This dialogue, Illum argues, develops through hearing, touching and seeing. The maker's previous experiences help establish an embodied qualitative knowing of, for example, when the nail has been sufficiently nailed. Further, Illum and Johansson (2009) illustrate how students build their own world of experiences when they experience what 'smooth enough' looks and feels like, which the researchers argue, creates a collective memory. In regard to learning from experiences with material, Johansson and Lindberg (2017) show with empirical examples from crafting activities that the knowledge of – in this case, recognising the straight grain in a fabric – changes with increasing experience. The authors argue that it is in the actions of hesitation that new experiences and the learning of new things emerge, and further, that with increased confidence, attention can be shifted

to something else in the crafting activity. Furthermore, the participation of crafting materials in the educational sloyd classroom also matters in relation to gender expectancies, and Sigurdsson (2014) focused on this in his research. In particular, Sigurdsson analysed how the masculinity of the wood and metal workshop is performed and embodied by the students during class. He argues that the wood and metal workshop holds a strong material classification in addition to gendered expectancies. Accordingly, the body and how the body can learn to answer to the material in a back-and-forth dialogue, and moreover, how certain qualities are dealt with in the learning process, such as a high degree of smoothness or acknowledging a straight grain, influence the learning process. These student–material relations also materialise beliefs and behaviours related to gendered expectancies.

To conclude, in this section, I presented previous examples of craft research that show how multiple factors influence the learning activity of crafting, such as purpose of the activity (Borg, 2008), the purpose the students have, the students' previous experiences, the social context, such as interactions with peers (Rönkkö & Lepistö, 2016), the teacher's strategies/pedagogy (Hasselskog, 2010), the teacher's interpretations of the syllabus (Jeansson, 2017) and how, in the crafting activity, the expectation of masculinity is performed and embodied by the students in the wood and metal workshop (Sigurdsson, 2014). In addition, the body influences the learning activity (Andersson, Garrison & Östman, 2018; Andersson & Johansson, 2017; Borg, 2001; Ekström, 2012; Frohagen, 2016; Johansson & Lindberg, 2017; Westerlund, 2015). In particular, the body is part of the back-and-forth dialogue with the material that influences the crafting activity and what the students do. This research is particularly important for the thesis because it highlights the student–material relation as an embodied activity without neglecting the material, thus underscoring the importance of the student–material relation in providing knowledge. However, as the empirical research is limited in terms of what the material does and the differences that may occur in the dialogue with the material, it is possible to conclude that further research into student–material relations is needed. In particular, research is needed that, like my contribution, will also place an empirical focus on the material.

2.2.2 What influences the learning process in ESE

As there is no simple answer to how an environmental and sustainable future is created or a simple answer to what ESE aims *for* to create a sustainable development, ESE research argues that norms and values highly influence the teaching and learning processes (Jickling, 1992; Östman, 2003; Öhman, 2008). Due to the normative stance of ESE (Stevensson Broady, Dillon & Wals, 2013), there has been a call for heterogeneous and conflicting perspectives to be included in ESE (Hasslöf, 2015; Håkansson, 2016; Læssøe,

2010; Lundegård & Wickman, 2012). However, a heterogeneous perspective does not necessarily mean that the teaching and learning content will become more diverse (Öhman & Öhman, 2013) and heterogeneous perspectives can produce what Wals (2010) describes as ‘troublesome relativism’. Furthermore, ESE researchers have also shown that norms and values in learning practices are not just ideas floating around apolitically, but rather the ideas are materialised in educational practices with educational agendas, thus influencing the learning process (Ideland & Malmberg, 2015; McKenzie Hart, Bai & Jickling, 2009; McKenzie & Bieler, 2016). In line with this, Ideland and Malmberg’s (2015) research shows that what is considered ‘good’ behaviour regarding environmental and sustainability issues contributes towards fabricating the ‘eco-certified’ child. By analysing teaching materials that address issues of sustainable development, they found that the eco-certified child is constructed through combining personal guilt with global threats and detailed individual activities are connected to rescuing the flock and the planet. Another example of how norms are materialised is how specific cultural understandings – such as valuing the individual over the collective, humans over other species, and concepts over experiences – have influenced what McKenzie Hart, Bai and Jickling (2009) define as ‘cultural imaginaries’ and this can be traced to ecological and cultural losses.

In other words, norms and values influence students’ learning processes, and even if heterogeneous perspectives are emphasised in ESE, specific norms easily influence the learning activity, for example, when they highlight a specific individual behaviour or value humans or concepts over other species and experiences.

In ESE research, there is also an extended body of research that emphasises how students do not learn in isolation but in relations, and these relations influence the learning activity.⁴ In particular, Ross and Mannion (2012) claim that learning activities is a matter of identifying the ‘larger mesh of entanglements’, which concern not only how humans understand the environment but also ‘the coming together of teachers, learners, generations, materials and places, in order to remake these relationships’ (p. 312). This line of thought – that students are not isolated individuals learning on their own but rather entangled in a larger mesh – has made different materiality

⁴ For example, for socialisation and meaning-making, see Östman (1995, 2010, 2015), for relations to nature in ESE, see Scott and Gough (2003); Russell (2005); for student–adult relations see Mannion (2007); for relation to place in outdoor education see McKenzie (2008); Lynch and Mannion (2016); and regarding gender and intersectionality, see Russell, Gough and Whitehouse (2018); Russell and Fawcett, (2013).

perspectives⁵ relevant for ESE research (Clarke & Mcphie, 2016; Lloro-Bidart, 2017; Malone, 2015; Pyry, 2017; Rautio, Hohti, Leinonen, & Tammi, 2017, Rautio 2013; Somerville, 2016; Taylor, 2017) and further, when Van Poeck & Lysgaard (2016) sketch future research perspectives in ESE, they argue that materiality perspectives ‘offer relevant and inspiring ideas, concepts, frameworks and findings to ESE policy research as well as the broader field of educational research’ (p. 314). However, when it comes to the topic how crafting material is influencing a learning activity, little empirical ESE research exists. Therefore, the research interest in materiality perspectives is, in my view, a gateway into reflections on human and more-than-human relations. It inspires me to acknowledge the crafting material as a subject of inquiry in the larger mesh of entanglements that become materialised in the learning activity of crafting. As researchers have opened up for different materiality perspectives with more-than-humans such as human–nature (Clarke & Mcphie, 2016; Malone, 2015; Rautio, 2013), human–animal (Lloro-Bidart, 2017) and human–plant/bacteria (Affifi, 2014, 2017), this motivates me to empirically study the human–material relation and acknowledge how the crafting material participates and affects the learning process.

To conclude, how students are educated to take action on environmental and sustainability issues is not a simple matter because students are not isolated individuals learning on their own, but rather individuals entangled in a larger mesh. Materiality perspectives in ESE research have intensified the discussion on what a subject of inquiry or agent of knowledge can be when one is researching environmental and sustainability learning activities, thus motivating empirical studies of human–material relations with a specific focus on the crafting material.

⁵ The materiality interest is to be found in different fields of research, such as science technology studies (STS) and actor network theory (ANT) research (Latour, 1993; Law & Hassard, 1999); gender research (Barad, 2003, 2007; Haraway, 2007, 2015); post humanism (Bradotti, 2013; Snaza & Weaver, 2015; Taylor, 2016); alien phenomenology (Bogost, 2012), and Object Oriented Ontology (OOO), (Bryant, 2014; Harman, 2009; Morton, 2013).

3. Theoretical perspectives

This chapter presents the theoretical perspectives that underpin the thesis. In the first subchapter (3.1), I present a theory of crafting, while in the second subchapter (3.2), I situate the theory of crafting within a theory of teaching and learning. The third and final subchapter (3.3) explains how the theories are used in each paper.

3.1 A theory of crafting

To study the activity of crafting, this thesis draws upon an important theoretical source – Ingold’s (2011, 2013) theory of making as a ‘practice of correspondence’. In the following section, I present the practice of correspondence theory and discuss it further in relation to agency and storytelling.

3.1.1 Practice of correspondence

Crafting is about making things. Therefore, one could easily assume that crafting starts with an idea about what one wants to achieve, and then the craftsperson imposes that form onto the material. However, Ingold takes a different view:

I want to think of making, instead, as a process of *growth*. This is to place the maker from the outset as a participant in amongst a world of active materials. These materials are what he has to work with, and in the process of making he ‘joins forces’ with them, bringing them together or splitting them apart, synthesising and distilling, in anticipation of what might emerge. (p. 21)

Ingold describes growth as a form of human–material correspondence. Thus, making should not be understood as a process of interaction between two closed parties that connect through some kind of bridging operation (2013, p. 107) but rather a process whereby the parties are open to one another and bind together as lines (2011, p. 152). The correspondence involves real-time movement and sentience, which means that the crafting material is considered to be active in an already ongoing movement where, like humans, material is (already) situated in life (pp. 29, 105). From this follows the idea that we do

not *acquire* knowledge about the material by standing outside the material world, but rather we know because we are already part of the world (2013, p. 5). In Ingold's view, this means in epistemological terms that knowledge *emerges* in movement:

We say 'the wind blows', because the subject-verb structure of the English language makes it difficult to express it otherwise. But in truth, we know that the wind *is* its blowing. Similarly, the stream *is* the running water. And so, too, I *am* what I am doing. I am not an agent, but a hive of activity. (2011, p. 17)

According to this argument, the crafting material is not known for what it is in itself but rather for what it does in action together with the craftsperson. A good description of when a craftsperson knows how to answer to the material is 'skilled':

the essence of action lies not in aforethought (as our human philosopher would claim) but in the close coupling of bodily movement and perception. But that is also to say that all action is, to varying degrees, *skilled*. The skilled practitioner is one who can continually attune his or her movements to perturbations in the perceived environment without ever interrupting the flow of action. But such skill does not come ready-made. Rather, it *develops*, as part and parcel of the organism's own growth and development in an environment. (2011, p. 94)

It is sometimes said that when one knows crafting, one does not need to 'think'. However, the idea of crafting as correspondence counters this idea of crafting as routine actions (i.e. as a repetitive, predetermined mechanism of specific human behaviour). Pye (1968/2010) explains that crafting is not only a workmanship of risk, which means that the result is always in doubt (p. 342), but also a workmanship of certainty, which means that the forces that are joined cannot produce any result. These two concepts – risk and certainty – are always combined (p. 343). Thus, the result is always regulated by the correspondences between the maker, the material, and their respective qualities.

In line with Pye, Ingold (2011) argues and contends that crafting as skilled knowledge is not an automatic process but rather a rhythmic response to ever-changing environmental conditions (p. 61; Ingold, 2000, p. 437). In the thesis, I understand this process (i.e. answering to the material as correspondence) as a process in which the qualities or forces of the maker and the material are joined in action. More importantly, given that crafting as correspondence is an ongoing collaboration of risk and certainty, each crafting process has specific characteristics. Ingold's concept of correspondence enables me to understand crafting activities where the material and craftsperson are both considered participants, as they answer to each other in correspondence.

3.1.2 Agency in practice of correspondence

One important implication of the ‘practice of correspondence’ is that the material and the maker are both engaged in the crafting. Thus, the theory of practice of correspondance suggests that crafting can be analysed not only as a human project but also as a relational process in which both the human and the material are active. When researching such co-creating processes, questions about agency and intention are likely to arise. Bennett (2013) explains further:

A glass of water doesn’t have intentions or a will, but it makes sense to admit that it has propensities and insistences, maybe even a kind of striving along the lines of what Spinoza called *conatus*. Again, it’s not that individuated objects are agents. But they can be powerful actants in operation with others. By actant I mean an entity or a process that makes a difference to the direction of a larger assemblage without that difference being reducible to an efficient cause; actants collaborate, divert, vitalize, gum up, twist, or turn the groupings in which they participate. (p. 149)

According to Ingold (2011) and Bennett (2013), the materials do not have intention or a will. But, as Bennett argues in the previous quotation, materials can be powerful actants operating with others. How this ‘operation with others’ is addressed in research has been the subject of much discussion. Clearly, this is not an easy task. Bennett (2010, pp. 108, 152) struggles with how to address agency or agencies as she discusses the causes and effects of agency, and Ingold (2013, p. 97) claims that Bennett’s ambiguity is a consequence of her attempt to express the processes of growth and becoming in a language of causality. One way to bypass the question of agency is to focus on the activity in which agency is distributed (Barad, 2003, p. 803; cf. Bradotti, 2013, p. 158). Ingold follows Barad on this issue and argues that materials, or for that matter, humans, do not possess agency:

things are alive and active not because they are possessed of spirit – whether *in* or *of* matter – but because the substances of which they are comprised continue to be swept up in circulations of the surrounding media that alternately portend their dissolution or – characteristically with animate beings – ensure their regeneration. (p. 29)

In the thesis, I follow Ingold’s (2013, pp. 96–97) argument that the question of agency rests upon a false premise that persons are capable of acting because they possess agency. According to Ingold, humans or more-than-humans do not possess agency. The focus is rather that humans and more-than-human are possessed by action. From this stance, it is a matter of that ‘things are in life, rather than life in things’ (2011, p. 29). In regard to my thesis and the analyses,

this means that agency is considered to always emerge in action and not as if it ‘belongs’ to either the human or the material.⁶

3.1.3 Storytelling in practice of correspondence

The question of how a phenomenon constitutes or materialises as a specific meaning is particularly relevant for this thesis. For example, crafting is often constituted as being genuine (Frayling, 2008); however, the question of how this constitution is made needs more consideration, for instance, by asking: genuine to whom? And further, compared to what? To answer these questions, I draw on Ingold’s concept of stories (2011).

Ingold (2011) argues that, for an object to become meaningful, like a tool, ‘it must be endowed with a story, which the practitioner should know and understand in order to recognise it as such (i.e. as a tool) and use it appropriately’ (p. 56). But what does this mean? Is it reasonable to think about tools as stories? Ingold continues:

Just like the stories do not carry their meanings ready-made into the world so, likewise, the ways in which the tools are to be used do not come pre-packaged with the tools themselves. But neither are the uses of tools simply invented on the spot, without regard to any history of the past practice. Rather, they are revealed to practitioners when, faced with a recurrent task in which the same devices were known previously to have been employed, they are perceived to afford the wherewithal for its accomplishment. Thus, the functions of tools, like the meaning of stories, are recognised through the alignment of present circumstances with the conjunctions of the past. Once recognised, these functions provide the practitioner with the means to keep on going. (p. 57)

In basic terms, what Ingold argues is that a specific meaning is not fixed or imposed in a tool, but rather meaning emerges as a co-creating process recognised through the alignment of present circumstances in conjunction with the practitioner’s past experiences of the tool and its functions.

⁶ In *the SAGE handbook of learning* (Scott & Hargreaves, 2015), Fenwick (2015, pp. 82–93) summarises four shared understandings in socio-material approaches to learning. There are many similarities between the four shared understandings that Fenwick presents and the practice of correspondence as well as the transactional approach in regard to meaning-making. Concerning the ‘web’, however, that Fenwick points to, Ingold (2011) has another approach. Rather than examine how things, matter, and humans are enacted in a network, Ingold argues for a ‘meshwork’ and uses the spider as an example. The web for Ingold is not an entity or an assemblage of bits and pieces but rather a tangle of threads and pathways. For Ingold, the web is the very condition for the spider’s agency, but the web, in itself, is not an agent (pp. 91–93).

I argue that the meanings that emerge in crafting are productive to address as stories. For example, if crafting is recognised as being genuine, it is because the story that constitutes and materialises crafting is recognised as such. These stories are told not only by spoken words but also as embodied stories.⁷ According to Ingold (2013), ‘to tell’ has two related senses: it refers to being able to recount stories of the world, and it also refers to being able to recognise subtle cues in one’s environment and respond to them with judgement and precision (p. 110).

To summarise, crafting as a ‘practice of correspondence’ is a process where the maker and the material are joined in action as they answer to each other. Humans do not think first and then act, as if the two could be separated. Rather, crafting emerges (thinking/acting) in an embodied movement, which is why one area of focus for the thesis is not what humans or materials are but rather what the materials and humans *do* in the ‘practice of correspondence’. The meaning that emerges in the practice of correspondence is recognised as stories. To tell a crafting story refers to the ability to recount stories of the world and to recognise and respond to subtle cues in one’s environment with judgement and precision.

3.2 A transactional approach to meaning-making

In this subchapter, I situate ‘practice of correspondence’ in a teaching and learning theory by presenting a transactional approach on meaning-making (Dewey, 1938/1997), and I also define learning crafting.

3.2.1 Meaning-making in teaching and learning craft

Dewey is a well-known reference in education and educational theory. By applying Dewey’s theories on transaction and meaning-making, I follow scholars who have theoretically and methodologically used and developed transactional approaches to meaning-making within teaching and learning practices (See for example Almqvist, 2005; Andersson, 2014; Hansson, 2014; Klaar, 2013; Lidar, 2010; Lundegård, 2007; Lundqvist, 2009; Maivorsdotter,

⁷ As Shilling (2016) argues, although education concerns bodily action just as much as cognitive thought and these two are ultimately inseparable, physical action is often neglected in most analyses of teaching and learning. He further argues that ‘the marginalization of the body does not only relate to how we learn to engage with experience and alter the environment, but the marginalization also neglects the development of physical abilities, habits and techniques’ (p. 56). Here, Shilling underscores that the body does not solely concern the social and cultural, although that is important, but rather the physical body also needs to be acknowledged in educational studies.

2012; Öhman, 2006; Östman, 1995, 2010; Quennerstedt, 2006; Rudsberg, 2014; Wickman & Östman, 2002).

Dewey never defines learning *per se*. Instead, he discusses how meaning emerges and is made in action (Dewey, 1938/1997; cf. Garrison, 1994). In *transaction* – which is Dewey’s (Dewey & Bentley, 1949/1991) term for what I refer to as ‘practice of correspondence’ (Ingold, 2011) – meanings come into existence jointly. In his early writings, Dewey, (1929/1984) used the term ‘interaction’, but to emphasise the co-creating process, he later uses the term ‘transaction’ (Dewey & Bentley, 1949/1991). Along a similar line, Ingold (2013) argues that, in crafting activities, when a craftsperson joins forces with the material, it is not a process of interaction that Ingold describes as ‘two closed parties connecting with some kind of bridging operation’ (p. 107); rather, correspondence means that the parties are open to each other and thus correspond, or to use Dewey’s term, they transact.

Consequently, if meanings come into existence jointly, one cannot presuppose the meaning that will emerge in transaction. Dewey (1938/1997) puts it as follows:

The conceptions of situation and of interaction are inseparable from each other. An experience is always what it is because of a transaction taking place between an individual and what, at the time, constitutes his environment, whether the latter consists of persons with whom he is talking about some topic or event, the subject talked about being also part of the situation; or the toys with which he is playing; the book he is reading (in which his enviroing conditions at the time may be England or ancient Greece or an imaginary region); or the materials of an experiment he is performing. The environment, in other words, is whatever conditions interact with personal needs, desires, purposes, and capacities to create the experience which is had. Even when a person builds a castle in the air he is interacting with the objects which he constructs in fancy. (pp. 43–44)

What Dewey makes clear is that what emerges as experience is a transactional process between a person and whatever constitutes his or her environment. Thus, Dewey argues that it is a mistake to suppose that a skill learnt in a specific setting will automatically mean being prepared to use this skill in a future setting, which may have conditions unlike those in which the specific skill was learnt (1938/1997, p. 48). Here, Dewey differentiates between a desire (or a wish) and a purpose (or an end-in-view). He explains that the latter is a method of action based on foresight of the consequences of acting under given observed conditions in a certain way (p. 69). In other words, one might have a vision for a specific teaching and learning activity, but the outcome of the teaching and learning content emerges transactionally in practice in relation to specific purposes.

Drawn from this transactional approach to meaning-making, learning is to coordinate one's actions to the surrounding world (material and cultural) and for a specific purpose (Andersson, Garrison & Östman, 2018). To learn to craft could be described as coordinating one's action to the material in a practice of correspondence that is situated in a practice with a purpose (even if this purpose is emerging). The meaning that emerges from this activity could be described as stories that are not only verbal narratives but rather stories that embody socio-material relations.

3.2.2 Transactant as a theoretical and analytical object

What can be acknowledged from a transactional theory of meaning-making, as described, is that a material's participation is equally as important as the student's participation if the material constitutes the student's environment. Yet, to acknowledge that – as in, to give voice to and explicate *how* material comes to matter in transaction – is not an easy task. To acknowledge the material's participation, my co-author of Paper II and I have developed a theoretical and analytical object that we define as a 'transactant'. We developed the concept because, when we worked with the analysis, the crafting material and how it participated easily disappeared in favour of human action (cf. Sørensen, 2009). Furthermore, as we worked with and wrote about the empirical data, we searched for a language with which we could describe how the material did or did not participate in the teaching and learning processes. From this struggle, we identified the need for a concept to help us do so. In what follows, I explain the theoretical inspiration and how the concept should be understood.

The inspiration for the concept of transactant comes from two separate theoretical stances. The first theoretical inspiration is pragmatism and Dewey's concept of transaction, as described. Here, we follow researchers who have studied teaching and learning processes as transactional processes where meanings are studied as emerging and made-in-action (Wickman & Östman, 2002; Öhman & Östman, 2007). The second theoretical inspiration is from a socio-material approach to learning (Fenwick, 2015, pp. 82–93) that emphasises 'matter' – that is, things that matter (p. 83, cf. Barad, 2003). Within this theoretical interest of matter, the term 'actant' is commonly used. Originally introduced by Latour (2004, p. 237), an actant is a semiotic term covering both humans and more-than-humans. With reference to Latour, Bennett (2010) explains that an *actant* 'is that which has efficacy, can do things, has sufficient coherence to make a difference, produce effects, [and] alter the course of events' (p. viii). This definition of actant provided by Bennett is used when joining the terms 'actant' and 'transaction' to form 'transactant'. The development of transactant is thus rooted in a transactional

framework but with inspiration from a socio-material interest on matter, and specifically, on the use of actant.

What ‘transactant’ gives us is a concept that makes it possible to acknowledge that which emerges in transactional teaching and learning activities of craft. Importantly, given that the transactant is rooted in a transactional framework, it is impossible to know beforehand what will become a transactant. However, by empirically following the teaching and learning processes, we can analytically identify what (human and more-than-human) emerge as transactants. For the actant to be identified as a transactant, it has to emerge with a ‘force’ in the transactional activity. In this process of identifying what has a force in the transactional activity, the concept is used as an analytical object.

The concept can also be used in a theoretical way, which means that it is not only used to identify a specific thing but also to explain why certain things happen. In other words, not every actant makes a difference in the learning process, and as a theoretical object, transactant can be used to explain specific data and illustrate what makes the learning activity go in a certain direction. Thus, the transactant offers a language with which we can identify (analytically) and further illustrate (theoretically) what makes the learning activity go in a certain direction.⁸ Perhaps the most interesting aspect of transactant is that the concept enables one to show how a certain materiality or the physicality of things has a force in the process, which is not always given attention in educational research. It is within this context that this concept may have great potential. How transactant is used empirically is further described in chapter 4 and also discussed as a contribution in chapter 7.

To summarise, the thesis draws on a transactional approach to meaning-making (Dewey, 1938/1997), which is compatible with a practice of correspondence (Ingold, 2013). The teaching and learning outcomes are transactionally made in practice. For the students, learning crafting is to coordinate their actions to the material in a practice of correspondence that has a purpose (even if this purpose is emerging or changing). The meanings that emerge from this activity could be described as stories that embody socio-material relations. In this thesis, the concept of transactant has been developed as a theoretical and analytical object to show what has a specific force in the teaching and learning activities of crafting.

⁸ Cf. Ingold’s (2011, p. 9) argument that material is not known for what it is but rather for what it does.

3.3 Specifications of the theories used in the papers

In Paper I, I explore possible teaching and learning contents. After the findings of the literature study have been identified (i.e. the purpose of crafting as well as what skills are valued in relation to the purpose and approaches to teaching and learning), they are discussed in relation to educational philosophies (Brameld, 1950; Englund, 1986/2005). In particular, Englund's (1997) typology of educational philosophies is used as a framework to discuss and illuminate the similarities and differences of the possible teaching and learning content of crafting when it is considered as a matter of ESE.

In Paper II, I examine what influences the learning process, in particular the process where students learn by remaking old clothes and textiles. In addition, Dewey's (1929/1984) concepts of transaction and meaning-making are applied to examine how students learn and what influences the learning activity. Here, the concept of transactant is used primarily as an analytical object, and to some extent as a theoretical object.

In Paper III, I continue to examine the human-material correspondences by drawing on Ingold's (2011, 2013) practice of correspondence. To empirically study the correspondences and how the students and the crafting material answer to each other, I follow the participation and give a voice to the material in the correspondences.

In the final paper, Paper IV, I examine the significance of students' encounters with materiality when students learn for sustainability. Here, I use Ingold's concept of practice of correspondence and 'storying' (Ingold, 2013).

4. Methodology

This chapter gives an account of the research procedure, in particular, the empirical data and research contexts (4.1), analytical methods (4.2) and analytical processes (4.3). In the final section, I also account for any ethical considerations (4.4). A critical discussion of the methods outlined in this chapter is presented in chapter 5.

4.1 Empirical data and research contexts

To contribute with new and deepened knowledge about teaching and learning of craft when the activity is considered as Environmental and Sustainability Education (ESE), I constructed the data in two ways. The main method of the data construction is through observations using video recordings, which resulted in the three case studies of Papers II, III and IV. As a way to provide knowledge of possible craft teaching and learning content in historical settings, the second data source was through the literature review, which resulted in Paper I.

The literature study is an explorative study and should be viewed as a starting point for identifying possible teaching and learning content. What first piqued my interest in exploring a possible teaching and learning craft content relevant for ESE were the last two decades of public interest in craft, not only in Sweden but also in Europe and North America. It seemed to me that this was not the first time that crafting has been argued to contribute to a more sustainable society. Luckman (2015, cf. Cummins, 2010; Jacob, 2013) explains that the current movement can be regarded as the third wave of international interest in craft. The first wave came as the late British Arts and Crafts Movement and the second wave of craft coincided, as Luckman (2015) explains, ‘with the heady countercultural hippie days of the 1960s and the 1970s’ (p. 18). Thus, according to Luckman, three waves of international interest in craft have taken place. These three time periods, which I date as 1900, 1968 and 2017, were the starting point for selecting relevant literature.

The three case studies were carried out in the Swedish craft subject, educational sloyd. The school subject was originally introduced as a subject

in Sweden at the end of the 19th century, and today, the subject is mandatory in Sweden from Grades 3–9. The subject is divided into two different classes: one class is where the students work with wood and metal, and the other class has students working with textiles such as yarn and fabrics. All students take both classes. The empirical data of this thesis was drawn from a textile class in a Grade 8 class, where the students are between 14–15 years old. One teacher solely taught the class, which comprised 15 students. I filmed one semester (20 weeks) in a class where the students worked with textiles for 80 minutes per week, and two projects were filmed: an embroidery project (10 weeks) and a remake project (10 weeks). To construct the video data, I used two cameras: a GoPro action camera that was worn by the teacher (at waist/chest height) and a portable camera that was used by me. During the filming, I tried not to talk to the students and I filmed from a distance, whereas the teacher's camera provided close-up recordings. In total, the video recordings resulted in approximately 40 hours of footage.

The video data enabled me to examine the teaching and learning process in action, and as a strategy I created three case studies (two from the remake project and one from the embroidery project). The case studies allowed me to zoom in on an activity and describe or examine that activity in detail (Yin 2014). In finding relevant cases, I followed Yin's (1994) recommendation:

Relying on theoretical propositions. The first and more preferred strategy is to follow the theoretical propositions that led to the case. The original objectives and design of the case study presumable were based on such propositions, which in turn reflected questions, reviews of the literature, and new insights. The proposition would have shaped the data collection plan and therefore would have given priorities to the relevant analytical strategies. (pp. 103–104)

Yin advises that the case should originate from the theoretical propositions rooted in the objectives of the study and relate to the ongoing research debate of the phenomena under study. Following Yin, the construction of the video data was motivated by two propositions regarding environmental and sustainability issues in relation to craft in ESE research (see chapter 2), namely:

- (1) that recycling and remaking activities are relevant for ESE (case study one and three), and
- (2) that more-than-humans are relevant in and for ESE (which are discussed in different ways in all three case studies).

To organise the video data from the video recordings, I made a content log of each recording, and this was used to sort the empirical data, to give a quick

overview, and to locate particular shooting sequences (Jordan & Hendersson 1995, p. 43).

4.2 Analytical methods

The *first analytical method* used in the literature study is a qualitative interpretative text analysis (Säfström & Östman, 1999) which helped us identify possible crafting content from the literature. The analysis was conducted in three steps: identifying (1) the purpose of the craft activity (2) what skills are required to fulfil the purpose, and (3) the approaches to learning. For example, if it is stated in the literature that humans craft to feel whole as persons, the identified purpose in the first step is to ‘feel whole as persons’. In the second step, the skills to achieve the purpose in question were identified. For example, if having control over the whole process was argued to be necessary to achieve the purpose, then having control over the whole process was identified in the second step. In the third step, we identified the approaches to learning in the crafting activity, for example, how the teaching was carried out and the learning was achieved when students learnt to ‘feel whole as persons’ (purpose) and ‘having control over the whole process’ (skill). These three steps helped us explore a crafting content.

The *second analytical method* used in the first case study of the remake project (Paper II) is a practical epistemological analysis (PEA), which helped us analyse the learning process in action (Wickman & Östman, 2002). Four PEA concepts are used as an analytical framework: (i) purpose, (ii) gaps, (iii) relations, and (iv) encounters. In short, in the *first step* of PEA, the ends-in-views in the selected events are identified. This step includes ascertaining the purposes, or ends-in-view, that evolve in the activity. In the *second step*, the analytical gaps are identified in relation to the ends-in-view. For example, if an end-in-view is to cut a straight line, this opens up a gap in the student’s desire to cut a straight line and the actual outcome. In the *third step*, the analysis focuses on the various kinds of relations that the students use to fill the identified gaps. For example, what makes the student cut a straight line? This could be, for instance, knowing how to draw a straight line with a ruler. Then, knowing how to draw a straight line is analytically identified as a relation. In the *fourth step*, the encounters of each relation are examined, which means that everything that the student encounters in the analytical concept of relation is identified, for example, what the student encounters when she or he draws a straight line (i.e. ruler, paper, desk, jeans, teacher’s knowledge, etc).

The *third analytical method* used in the second case study of the embroidery project (Paper III) derives from, and is partly constructed on the basis of, Ingold's (a) 'practice of correspondence' and (b) Sørensen's (2009) methodological typology of performance, participation, and imaginary. The analytical method helped us explore the human-material relation, and specifically, how the crafting material had a force in the learning process. As a starting point, we examined the activity when students were learning to make a piece of embroidery as a practice of correspondence. To construct empirical data that illuminates the practice of correspondence, we used Sørensen's typology. In the first step, we identified participation. Sørensen (2009) argues that *participation*, as a concept, guides the researcher to observe what happens, and here, the researcher should not focus on the participants but rather follow the activity and describe which components take part. For example, if students are about to make an embroidery, we identify what participates and follow the movements in the activity. In the second step, we identified what is *performed* through this participation, which is the second concept and achieved through 'an arrangement of interrelating parts of participants' (p. 28). For example, instead of saying that the student thinks it is difficult to thread the needle, we describe the activity and how the thread and the student correspond to each other. The third step is the concept of *imaginary*. In this step, Sørensen theoretically develops what she defines as the patterns of relations. Here, she uses the concepts of participation and performance to examine the characteristics of the spatial formation, which involve giving a 'meticulous description and characterisation of forms of knowledge and forms of presence' (p. 193). In this third step, we used other imaginary concepts, and accordingly, did not use Sørensen's spatial formation. Instead, we used a technical description of the thread's participation that describes what the thread was doing in the participation and performance. The reason for this choice was that we wanted to further emphasise an analysis that reflects our research focus on the material's participation and not discuss different 'knowledge constructions'. When the three steps of participation, performance, and imaginary had been carried out, we analysed the constructed data further by identifying different practices of correspondence.

The *fourth analytical method* used in the third case study of the remake project (Paper IV) derives from, and is partly constructed on the basis of, Ingold's (a) 'practice of correspondence' and (b) his notion of 'stories'. This Ingold-inspired analysis helped me explore the significance of students' encounters with materiality in general and with crafting materials in particular when learning for sustainability. The analysis was conducted in three steps. In the first step, the correspondences between the student and the remake material were identified. For example, if a student remakes a pair of jeans, what the students and the jeans are doing in the activity is recognised; for instance, the

student and the jeans answer to each other as the design of a pillow emerges. In the second step, the stories that the student recognises in the design process are identified. For example, if the jeans' form is recognised in the activity, the form of the jeans is recognised as a story. In the third step, the constructed data from the correspondences and stories are discussed in relation to historical remake practice (i.e. in conjunction with the past). By taking a materiality focus on the remake practice, I 'thread back', as in, connecting the stories with conjunctions of the past, and I 'thread forward' to discuss pedagogical opportunities as students learn for sustainability.

Together, these four analytical methods have helped me provide new knowledge about crafting when the activity is considered as ESE. We now turn to how the analytical processes were conducted in each study.

4.3 Analytical processes

4.3.1 Analytical process of Paper I

The aim of Paper I is to explore and identify possible ESE teaching and learning craft content.

The three waves of international interest in craft were the starting point for selecting relevant literature. Based on these three waves that I date as being from 1900, 1968 and 2017, three criteria guided the data-gathering process. The *first* criterion was that the craft practice should in some way be relevant to the stipulated broad notion of sustainability, where social, ecological and economic processes function together. In other words, the practices do not have to explicate that they engage with the specific definition of Sustainable Development expressed in the Bruntland report from 1988. Crafting literature that did not show any sign of relating to our definition of sustainability was excluded. The *second* criterion was that the craft practices should deal with formal, non-formal or informal educational activities, and are therefore potentially educative. The *third* selection criterion was that the literature should maximise a variation of narratives from both women and men, and include crafting activities that involve different types of crafting material. With the aid of these three criteria, we identified seven craft practices. From 1900, we identified (1) the arts and crafts movement and (2) the Swedish home craft movement. From 1968, we identified (3) the hippy movement and (4) the movement surrounding the *Whole Earth Catalog*, and from 2017, we identified (5) woodworkers, (6), makers, and (7) craftivism. To select texts from the seven crafting practices, I read literature from and about them. Where I could identify a first-hand source, I chose to read those, for example, texts

written by John Ruskin and William Morris for the arts and crafts movement, Betsy Greer for craftivism, Paul Sellers and Chris Swartz for woodworkers, and Chris Anderson and David Guantlett for makers. These texts were also complemented with literature about the movements with researchers writing about the movements, such as Jackson Lears (1981) and Adamson (2007, 2010, 2013). Where there was no clear leading figure or first-hand source, I chose literature about the movements, which was the case for the Swedish home craft movement, the hippie movement, and the movement surrounding the *Whole Earth Catalog*. In these cases, I read research about the movements as well as literature that is used in university courses regarding craft and craft history. (For a specified list of the literature, see Paper I, p. 12).

When a text of interest had been identified, we underlined passages where the purposes of learning craft were stated. These passages were then targeted for further analysis.

In the first step of the analysis, we noted every purpose for learning craft from the selected texts. From these purposes, we identified the skills that were regarded as important in order to achieve this purpose. Thereafter, we explored how these purposes and skills are intended to be learnt, which thus pointed to the approaches to learning (for a detailed description see Hofverberg, Kronlid & Östman 2017, p. 12). This first step of the analysis created what we define as the theoretical construction of a teaching and learning content.

In the second step, we aimed to use the findings from the text analysis to illuminate the teaching and learning differences. To do this, each craft practice was analysed in relation to the educational typology constructed on the basis of the four educational philosophical positions (for a detailed description see Hofverberg, Kronlid & Östman 2017, pp. 10, 12, 18).

In the third and final step of the text analysis, the theoretical construction of possible teaching and learning content identified in steps one and two were discussed as implications for ESE. As a whole, this text analysis provides a detailed exploration of possible teaching and learning content for crafting constituted by assumptions made in the literature about the purpose of the praxis and acquired skills as well as approaches to learning. In the paper, the constructed data from the text analysis are discussed as having possible implications for ESE.

4.3.2 Analytical process of Paper II

The aim of the second paper is to examine how students learn with garments and textile refuse when engaging in a remake project.

To select empirical data for the first case study, we used three selection criteria. The first selection criterion was the student–material encounter, which involved that I selected ‘events’ where the students and the material were both part of the activity. The second selection criterion, which aimed to narrow the empirical data, was the expression of ‘aesthetic judgements’. The reason for this criterion is that earlier studies (Jakobson & Wickman, 2008; Maivorsdotter & Quennerstedt, 2012; Maivorsdotter & Wickman, 2011; Wickman, 2006) have shown that people make aesthetic judgements in meaning-making processes as they experience fulfilment in relation to the expectations of the activity (a positive experience) or do not succeed to achieve a fulfilment (a negative experience). The aesthetic judgement is here identified as ‘utterances or expressions that either deal with feelings or emotions related to experiences of pleasure or displeasure, or that deal with qualities of things, events or actions’ (Wickman, 2006, p. 9). The third selection criterion of the video data was the quality of the video recordings. For example, sometimes it was not possible to hear or see what and how the human–material transactions evolved, and therefore, they could not be analysed (for further details see Hofverberg & Maivorsdotter, 2017, pp. 778–779).

When we conducted the PEA analysis, we ended up with a huge amount of data of relations (the third analytical concept), specifically, 258 relations. These relations were further analysed in the following way: first, my co-author and I read them several times and marked the similarities and differences among them. Here, we identified 28 different types of relations. Second, based on these readings, we categorised the relations into clusters based on similarities, which resulted in three major clusters that, in the paper, are defined as categories. In the paper, the category of the relations is presented and one example from each category is described in detail by showing the PEA analysis.

Due to our ambition to illuminate both human and more-than-human participation in the remake process, we (as described in the theory chapter) developed the concept of *transactant*. After we conducted the PEA analysis and categorised the relations, we used transactant as an analytical object. In the presentation of each example, with the aid of transactant as an analytical object, we could show what made the learning process go in a specific direction. For example, if the jeans’ uneven cut made the student continue the remake process in a specific way, the jeans were identified as a transactant. When the findings were further discussed in Paper II, the transactant was also used to illuminate and explain why certain things happened, for instance, when four layers of denim were hard to cut all at once. Here, the concept of transactant was used as a theoretical object, as it illustrated why the learning process emerged in a certain way.

When the transcript was translated from the video recordings to written text, the focus was on what Linell (1994, p. 11) identifies as approximating literal translation, which focuses on requirements of legibility. For our purposes, this meant that we focused on the content, (i.e. what the participants were doing in transaction was translated and described in an easy-to-read way). Further, we wanted the recycling material to become visible in the transcript, which prompted us to add drawings of key moments. These drawings were made by taking a screenshot of the specific moment that we wanted to highlight and then, from these photos, we sketched the drawings.⁹

4.3.3 Analytical process of Paper III

The aim of Paper III is to highlight the relevance of human–material relationships in crafting learning processes.

To construct empirical data for the second case study, we used two selection criteria. As the ambition was to follow the embroidery thread and show how the thread participated in the learning activity, the first criterion was the student–thread encounter in the crafting activity. This meant that we selected events in the video recordings with student–thread encounters. To scope the video data further, we used what we define as ‘troublesome friction’ between the embroidery thread and the students. By choosing troublesome friction, that is, when it is possible to empirically see that the thread is doing something in correspondence, it is likely that the event will reveal visible student–material correspondence compared with events that run more or less smoothly. For example, a troublesome friction becomes visible when there is a lingering gap in the learning process (Wickman & Östman, 2002) that makes the student turn to the teacher for help or the crafting activity is slowing down the crafting process. The selected video sequences with the identified troublesome frictions of the student–thread correspondences were then targeted for further analysis.

To examine how an embroidery thread participated in the particular human–material relation, we used Sørensen’s (2009) first two steps in her typology, namely, participation and performance, to describe in detail how the thread and the students co-created the learning activity together. As a third step – the imaginary concept – we give a technical description of what the thread was doing in correspondence, which means using footnotes to provide technical descriptions of what we imagined the thread was doing in these specific correspondences. However, these technical descriptions do not mean that the students know, for example, that the reason for why knots appear on the thread

⁹ Photographs were not used due to the research’s confidentiality requirements.

is because the thread is S or Z spun. Rather, technical descriptions provide a space and give attention to the thread in the human–material encounters and relations.

4.3.4 Analytical process of Paper IV

The aim of the explorative study stated in Paper IV is to illustrate a research approach that shows what students and the material do in correspondence and what stories emerge from this activity.

In the paper, illustrative examples are presented to show what students and the material do in correspondence and what stories emerge from this activity. In particular, two activities are presented where the students encounter the material: (1) when the students were deciding on the design of the remaking project (i.e. what to do, which material to use, and the shape, etc. of the imagined end product) and (2) when the students were trying to realise the design through crafting. I found these two activities particularly relevant for my analysis, as they made the human–material correspondence visible. These two activities were selected and targeted for further analysis.

In the first activity, it was possible to see from the empirical video data how six of the students (three boys and three girls) were in a decision-making process of what to remake. Given this visibility, these six students' decision-making processes were targeted for further analysis in the first activity. In the second activity, there were many human–material correspondences, therefore, to give a good overall scope of the human–material correspondences in the activity, I decided to follow four students who were all remaking jeans. To analyse the selected video passages, I watched the selected passages, and in the first step of the analysis, I noted how the correspondence between the student and the material developed. In the second step of the analysis, I explored what the student in focus recognised from the entangled student–material encounters (i.e. what stories they recognised). In the paper, I give four examples from these analyses by presenting excerpts and descriptions from the video data. I also add sketches from screenshots to provide a better understanding of the situation. In the third step of the analysis, I explored if there were any conjunctions between the stories that were created in students' remaking activities and stories about the crafting material in historical remaking activities in Sweden. These explorations with the past were targeted for further discussion in the paper.

4.4 Ethical considerations

The empirical studies have followed the guidelines produced by the Swedish Research Council for the Humanities and Social Science (2017).

The case studies involve personal data, as film is considered as such. However, given that no sensitive personal data was expected to emerge in the process or was indicated by the study's aim and methodological ambitions, the study was not subject to ethical review. This choice was made in dialogue with a member from the regional ethics committee in Uppsala.

The principles for informed consent and the voluntary nature of participation have been strictly adhered to in the planning and execution of the case studies (i.e. classroom observations). These were in collaboration with Joacim Andersson at Örebro University who also made video recordings in the research project 'Teaching and learning practical embodied knowledge', funded by the Swedish Research Council, which this study has been a part of.

Teachers, students and student guardians were informed in writing. Signed and written consent from the students and the students' guardians were collected for the recording of the students' activities in the school activity of educational sloyd. When I met the class and introduced myself, I also reminded the students verbally of the voluntary nature of participation in the project.

Ethical principles were also taken into consideration in the classroom during the video recordings. For example, the teacher turned her camera off on some occasions when she considered this appropriate for the sake of protecting the integrity of the research subjects (students). The camera operated by the researcher was also adjusted owing to such ethical considerations. For example, the filming was stopped when a student hurt herself and began to cry, which shows that attention was paid to the recording of sensitive data. The filming also stopped when a student would in any way indicate that he or she did not want to be filmed at that particular moment. One such example was when a student drew a picture of his product on a piece of paper and used his body to hide the picture from the camera. I respected this and moved on to another student. However, situations such as these seldom occurred, and most of the time, the students did not seem to be bothered by the camera. A few occasions occurred when the student would wave to the movable camera or talk to the camera, saying things like 'Did you get that on film?' or 'Look at my Instagram', which indicates that the students were aware of the moveable camera. My impression was that when the teacher (who was wearing a GoPro camera) came close to the students, the students did not pay attention to the camera but rather were more focused on getting help from the teacher.

How the activity of filming influenced the data construction is naturally relevant to acknowledge. On this matter, Tracy (2010, p. 847) points to ‘procedural ethics’, which she stresses encompass the importance of accuracy and avoid fabrication, fraud, omission, and contrivance. Using video recordings meant that no interpretations were made in the classroom, which implies a low risk of *in situ* fabrication of the data. However, the presence of the cameras may have affected the learning process in some ways, as mentioned, and thus, the data should be seen as constructed collaboratively by all participants, including the camera (Robson, 2009). Whether or not the camera’s impact on the result is possible to trace empirically in the activity has not been considered in depth.

When reporting and using the empirical data, fictional names are used to assure anonymity. In addition, the research material is stored on a locked hard drive to which only I have access.

5. Critical considerations

Given that an important part of research is to show transparency, this chapter presents a critical discussion of the theories and methodological concerns of the thesis. The stance that qualitative research requires other criteria compared to quantitative research is a well-established (Brinkmann, 2015; Gordon & Patterson, 2013; Guba, 1981; Lincoln & Guba, 1985; Lee, 2014; Lincoln, 1995; Tracy, 2010). For example, Guba and Lincoln (1985) argue that ‘applying traditional criteria like generalizability, objectivity, and reliability to qualitative research is illegitimate; akin to “Catholic questions directed to a Methodist audience”’ (p. 202). Further, Taylor (2016) questions the presumptions that one ‘can access, know about, and represent the “experience” of an “other’s” “reality”’ (p. 17) which she explains, various feminism and “post-” have already shown. What Taylor points to is how research (of which the researcher is very much a part) is made and produced, rather than representing any ‘truth’. Furthermore, according to Law (2004), instead of describing a social reality, methods as such create social realities. Yet, an important quality of research is that it is worthy of trust; therefore, transparency and the notion that knowledge is constructed require serious consideration. To address these issues, I turn to Tracy (2010) and her criteria for valuing qualitative research.

Tracy (2010) explains that it is important to find ways to value qualitative data that are flexible, yet accurate. She argues for distinguishing between the end goals of strong research (universal hallmarks of quality) and the variant mean methods (practices, skills and crafts) by which these goals are reached. Walby and Luscombe (2017) explain that instead of using validity, reliability and generalisability, which are common markers in qualitative research, Tracy’s methods use rich rigour, credibility and resonance. In addition to these three criteria, Tracy adds worthy topic, significant contribution, sincerity, ethics and meaningful coherence. Tracy (2010) explains that these eight qualitative markers provide an expansive structure for qualitative quality ‘while still celebrating the complex differences amongst various paradigms’ (p. 839). In my view, a fruitful solution is not to dismiss critical considerations but rather to discuss how the research was conducted, and in this discussion, also show the challenges. Accordingly, in this chapter, I discuss my theoretical and methodological considerations with the aid of Tracy’s (2010) eight key

markers. I will also draw from researchers who have used these key markers, such as Gordon and Patterson (2013) and Walby and Luscombe (2017). One challenge that Gordon and Patterson (2013) point out regarding Tracy's eight key markers is the danger of viewing the markers 'as fixed and inflexible, thereby reducing them to a checklist and defeating their purpose and utility' (p. 693). They propose that researchers can work towards the end goals through different means. In my research, the result is that I work towards the end goals – the key markers – but I have not used every single means that Tracy points out. The means that I have chosen to discuss here are those which relate to my research questions and also those that can highlight some of the challenges I have experienced. In the following text, I discuss all the key markers, with the exception of ethics, as ethics has already been discussed in chapter 4. I first describe the key markers in quite general terms, and then I focus on the challenges that have emerged in my research process, which is a reflection of this chapter's aim to show transparency.

Worthy topic is Tracy's (2010) first key marker. It is the idea that a worthy topic should be 'relevant, timely, significant, interesting or evocative' (p. 840). Tracy argues that a worthy topic often emerges from disciplinary priorities but may also grow from timely, societal or personal events, and given the nature of these, a worthy topic may arise in a variety of ways. Closely connected to worthy topic is the key marker, *significant contribution*, which Tracy (2010) argues should show how research 'extends knowledge, improves practice, generates ongoing research or if the research liberates or empowers' (p. 845). The topic for this thesis has been identified not only from ESE and craft research, where I have identified research gaps (as discussed in chapter 2), but the topic also derives from policy demands in the craft subject educational sloyd in Sweden, where working with materials in crafting activities is argued to contribute to promoting sustainable development (see the Introduction). How the thesis makes a significant contribution is further discussed in chapter 7.

Rich rigour – Tracy (2010) argues that high-quality research is marked by a rich complexity of abundance (p. 840). One way that rich rigour can be achieved, Walby and Luscombe (2017) argue, is by 'approaching the analytical process systematically, which is the same approach one would do in any qualitative method' (p. 543). In the thesis, the analytical process of each study is described in chapter 4 as well as in each paper. Another way to achieve rigour is through 'requisite variety' (Tracy, 2010, p. 841). Walby and Luscombe (2017) argue that requisite variety, which is a term originally from cybernetics, 'states that in order for a research instrument to accurately account for the thing it is studying, it must be at least as complex' (p. 543) and further, that qualitative phenomena require 'complex means of data collection, analysis, and explanation' (p. 543.). Drawn from this argumentation, Walby

and Luscombe conclude that simple explanations when interpreting a phenomenon should be avoided. In relation to my work, I have, with my theories and methods, been handling a requisite variety by not simplifying the learning process; for example, learning is not considered as a causal relation, nor an activity where a student learns in isolation. However, the transactional approach to learning that the thesis applies also provides some challenges; for instance, by zooming in on the human–material relation in the learning activity, other possible things are less emphasised in the analysis due to the human–material focus. Here, I would like to mention three things that would have been placed more to the fore if I would have made a different analytical cut.

The first example that could have been more to the fore with another analytical cut, is the role of the *body*. In crafting activities, the body is crucial. The body is indeed part of the analysis in the thesis, but with a different analytical cut, other bodily experiences would perhaps have been more explicitly stated, such as emotions and tactile experiences. A second example is that *gender* issues have not been considered much in the case studies. Gender is particularly relevant in the educational sloyd school subject owing to its history of being two different subjects: one for girls (crafting with textiles) and another for boys (crafting with wood and metal). Educational sloyd research (Sigurdsson, 2014) has also shown that gender is performed in educational sloyd even if the subject is not (formally) divided according to gender today. Therefore, the relevance of gender as a sustainability concern would have been interesting to examine further. In particular, there were 15 students in the class, seven boys and eight girls, and yet the empirical examples from the remake project in Paper II are mostly from boys, but why? This question prompted serious consideration, and here, I give three possible answers. First, most of the empirical data that was used in Paper II came from the teacher's GoPro camera. It turned out that the quality of this data was much better due to the sound quality and the detailed recording of the activity. Second, one can see that the majority of data used in Paper II came from two clusters and one single student. Together, they represent seven boys and three girls. Within these two clusters, my impression is that two of the girls worked more independently (and together) compared to the boys from these two clusters. This could be one explanation as to why more of the empirical data were from boys. Thirdly, some of the girls were absent more than the others, and this may also explain the lack of empirical data from girls. A third example that could have been given more space in the analysis is *the practice of educational sloyd*. For example, various valuations of educational sloyd show that students think that the subject is highly enjoyable (Hasselskog, 2010), but both the empirical findings and previous research (Westerlund, 2015) show that different emotions, such as joy but also frustration, emerge in the learning process. Therefore, how emotion relates to motivation, or the lack of motivation, would

have been relevant to explore further in relation to ESE. However, due to my analytical focus, this has not been extensively explored. Another aspect related to the practice of educational sloyd that I have not considered much is the assessment of the projects. How the assessment actually influences the learning process in educational processes would also have been relevant to acknowledge, especially as ESE has many different values and norms. Therefore, what is being valued and/or assessed and also what function the assessment has in the learning process would have been relevant to acknowledge. However, both these two factors, motivation/the lack of motivation and questions related to assessment, have not been given much attention in the analysis.

Sincerity as a key marker aims to show reflexivity and transparency in regard to the researcher's unique goals and interests as well as regarding challenges faced in the research process (Walby & Luscombe, 2017, p. 544). Sincerity is achieved with transparency about the methods and challenges, but also through self-reflexivity (Tracy, 2010, p. 840). Regarding my methods, other methods could have been used; for example, discourse analysis is well suited for text analysis and could have provided a more-detailed examination about how craft is constituted in the literature study. However, I chose not to use discourse analysis due to the variety of the literature that I draw on in the studies. Nevertheless, the text analysis, as it is done in Paper I, has similarities with a discourse analysis, as it examines a purpose, and here, a specific purpose provides an inclusion, and thus also an exclusion, of a specific content (cf. Säfström & Östman, 1999) which has similarities to a discourse analysis. Further, in the literature study, little attention was given to what the counterculture 'countered' and what consequences that might have had for the purposes of craft in different eras. In addition, the studies did not aim to fulfil empirical saturation (i.e. analysing empirical data until no new findings were identified). Rather, the analysis is explorative and provides many narratives of a possible craft content. This does not mean that there are no other possible craft contents.

Regarding the video recordings used in the case studies, the recordings were very rich. That other possible choices of selection would have provided another emphasis of the results has been previously discussed. What I have not discussed is my own positionality and the role I played in producing the research, which Tracy (2010) defines as 'self-as-instrument', and this is yet another way to achieve sincerity. We will now turn our attention to this question. When I started to work with this thesis, I did not think that being a craft teacher would affect the research process much because I was going to make observations with video recordings, which I thought would provide authentic data in which I would not play a central role. Indeed, the observations I made with the aid of video recordings turned out to be highly

useful, allowing me to watch the sequences over and over again, which meant that I could see things that I did not notice when filming. However, along the way, I have come to realise that I have been part of producing the data. That is, that I am a craft practitioner, a craft teacher, and also an ESE researcher has affected the research findings. I now present three significant factors concerning self-as-instrument.

Firstly, when making the selection of the third case study, which was the embroidery project, I used my craft knowledge. It was obvious from the empirical data that the thread participated in the process in different ways, but how to make sense of it took me quite some time to figure out. To be able to identify and give voice to the thread's participation, I used my craft knowledge and my experiences of making embroidery. With these experiences, I produced the technical descriptions that the analytical procedure resulted in. Secondly, my status as an ESE researcher probably had an effect on the teacher in the classroom, as the teacher in class emphasised environmental issues during the embroidery project saying things like 'Please do not throw away any leftover threads – think about the environment'. It is likely that she would have said this even in my absence, but I felt that I, to some extent, represented 'environmental issues', and this probably affected the teacher's behaviour. Thirdly, given that I am a craft teacher, I realised that, after the recordings, I could properly discuss educational craft issues with the craft teacher, and additionally, I felt that I had gained the craft teacher's trust. One thing that we discussed was that there is not much research on the subject of educational sloyd. From the discussion, it was clear to me that the teacher's willingness to help me construct empirical data was rooted in a motivation to contribute to research of educational sloyd. As a craft researcher, and in light of the lack of research, I feel a responsibility to ensure that the research I produce is well grounded, and given that the research is so limited, I am especially demanding of myself when it comes to accuracy and carefulness.

Credibility as a key marker refers to the trustworthiness and plausibility of the results and the fair representation of participant voices (Walby & Luscombe, 2017, p. 544). In short, Tracy (2010) explains, 'credible reports are those that the readers feel trustworthy enough to act on and make decisions in line with' (p. 843). To accomplish credibility, empirical examples are important, which are provided in all four studies. In addition, my aim is to show (rather than tell) and thus achieve trustworthiness and plausibility. Both in the literature study and in the case studies, the findings are contextualised in order to provide thick descriptions. To further demonstrate credibility, the empirical data in the first case study was analysed by the authors of Paper II, first separately and then together, where all four steps of PEA were considered as well as the concept of transactants. In this process, the credibility of the analysis was established by what Tracy (2010, p. 841) defines as

‘crystallization’, which means, among other things, that more than one researcher analyses the data (cf. Lincoln & Guba’s [1985] peer debriefing). In the other studies, I analysed the empirical data alone as well as in collaboration with my co-authors. Further, I have also presented the paper-in-progress at different seminars, which has been helpful to interpret the constructed data. To ensure credibility, in addition to providing empirical examples, I have provided a table (Paper I) and made drawings (Papers II and IV) to clarify the findings and make the findings visible. However, one challenge that I faced regarding credibility was that giving voice to the material and providing detailed descriptions increased the word count. It turned out to be a balance between showing and providing empirical examples on the one hand and making it fit the framework and the stipulated word count for a paper on the other.

Resonance as a key marker focuses on, according to Tracy (2010), research’s ability to meaningfully reverberate and affect an audience with aesthetic and evocative narratives.¹⁰ It is about how research ‘affects, influences, or moves readers or multiple audiences through aesthetic or evocative presentations and through serving as a mirror of for others to see their own experiences’ (Gordon & Patterson, 2013, p. 692). Tracy (2010) explains, that a relevant question to ask is ‘Did this affect me?’ (p. 845). The idea, according to Tracy, is that ‘qualitative research must be presented with clarity, avoid jargon, and be comprehensible to the target audience’ (p. 845). In the papers, the drawings and table are meant to meaningfully reverberate, with the aim to affect readers with aesthetic and evocative narratives. Furthermore, I have produced video abstracts to Papers II and III, which can be viewed on the journal’s website, and these also aim to affect the audience with aesthetic merit and curiosity. However, one challenge when aiming to affect an audience is that the audience is not one, and thus, some might find presentations or video abstract relevant, while others may not.

Another way to achieve resonance is through *transferability* (Tracy, 2010, p. 845; cf. Lincoln & Guba, 1985). According to Tracy (2010), transferability is achieved when ‘readers feel as though the story of the research overlaps with their own situation and they intuitively transfer the research to their own action’ (p. 845). The findings that are presented in the studies are, I would argue, not surprising, for example, some findings of the literature study. One example is how the arts and crafts movement claims the importance of working with one’s hands (not machines), which is not surprising, and learning how to thread a needle and understanding that handling knots is vital

¹⁰ Here, I have changed Tracy’s word from ‘representation’ to ‘narrative’ in order to highlight that the aesthetic narratives (e.g. drawings that I add to the empirical data) are representations that do not mirror a ‘truth’ but rather tell a new story.

in embroidery projects are also not surprising. Nor are the findings from the remake cases surprising, for example, that one needs to come up with creative solutions by oneself. Much of the empirical findings I present are therefore reasonable to anticipate. But what I add is that I empirically show how the teaching and learning process emerges, and by adding a pedagogical lens to the student–material relation, new knowledge is produced. The findings should also be understood in relation to previous research (which has been previously mentioned). In particular, I have made three case studies in quite a unique practice (educational sloyd). By focusing on two theoretical propositions (Yin, 2014) of ESE – the proposition that recycling and remaking activities are relevant for ESE (Paper II and IV) and the proposition that more-than-humans are of importance in and for ESE (Papers II, III and IV) – I have sought to produce research that is valuable across a variety of contexts or situations, which gives *resonance* and establishes *transferability* in ESE research. However, a challenge that emerged in relation to resonance was how to make the descriptions and the detailed analysis of the student–material relation relevant. For example, making an embroidery thread relevant for ESE is not self-evident. Moreover, not everyone believes that crafting as an activity has an obvious academic context, which required me to make especially sure that the case was relevant. Nevertheless, I have also experienced that, as the topic originates from a non-academic tradition, it tends to attract sincere interest.

According to Tracy (2010), *Meaningful coherence* as a key marker is about how researchers should ‘eloquently interconnect their research design, data collection, and analysis with their theoretical framework and situational goals’ (p. 848). In addition to how it is recognised, one challenge that I have experienced relating to meaningful coherence is with how practical knowing is presented. When doing research on crafting, it does not make sense to only talk about verbal language or cognitive knowledge. I have often thought about the limitations of writing about crafting. I have also thought about whether or not it would be possible to knit a story and tell the story with yarn. And even if that were possible, I would still face the problem of interpretation and trustworthiness. As Wittgenstein (1953) argues with his concept of language games, so too is knitting part of a different language game compared to the language of an academic text. Therefore, in the thesis, I use theories that make it possible to examine craft as an embodied activity that also embraces the crafting material. The methodology used in the thesis coheres with the theoretical stance and the results of teaching and learning craft that are to be understood as an embodied process. In this way, I have sought to establish meaningful coherence.

6. Findings

The following chapter presents a summary of the findings of each paper.

6.1 Paper I: Crafting sustainability? An explorative study of craft in three countercultures as a learning path for the future

The aim of the paper is to explore and identify possible ESE teaching and learning craft content.

The exploration was conducted by examining literature from and about three crafting countercultures from 1900, 1968 and 2017. In particular, seven craft practices situated within these countercultures were examined. In total, 23 different purposes for learning craft were identified (Hofverberg, Kronlid & Östman, 2017, pp. 12–15). The different purposes were further analysed based on which craft skills were acquired. Here, four different types of skills were identified: (a) functional skill, (b) aesthetic skill, (c) spiritual skill, and (d) etiquette skill (pp. 15–16). Drawing on the purpose-based analysis and the skill analysis, two approaches to learning in craft were identified, ‘expert-oriented learning’ and ‘learning (or not) by doing’ (pp. 16–17). This analysis of the approaches to learning also shows who and what participates, that is, who the craftspersons are and how the material is constituted.

When the findings were considered to have implications for ESE in relation to the study, we suggest in the paper that a learner’s agency is present in all the seven craft practices and that knowing craft empowers its practitioners in different ways. A crucial question that emerges from this suggestion is, empowered over what? When the findings that highlighted the different purposes, skills and approaches to learning were compared to one another, it was possible to identify three tensions. The first tension with implications for ESE is the individual versus the collective. The pedagogical consequences of this tension depend on whether we are educating for a group of citizens, an elite group of craftspersons, or if teaching and learning craft are for the benefit of everyone. Another aspect of this tension is between the pedagogically privileged and underprivileged. That is, to what extent can everyone learn to

craft and produce long-lasting products? Who is privileged to learn? Today, such questions must be framed in a global perspective and should also concern aspects regarding gender and socio-economic relations (Hofverberg, Kronlid & Östman, 2017, pp. 18–19).

The second tension that was identified as having implications for ESE overlaps with the first tension but is slightly different, namely, the embodied experiences of a craftsperson in relation to the world she or he inhabits. The embodied experience of joy is an example from the findings that illustrates this tension. Expressing joyfulness when using aesthetic and spiritual crafting skills can be found in many of the examined practices, but the experience points to different sustainability goals. How the embodied experiences, such as being joyful in quality crafting, or even enchanted, inform our reflections on and beliefs about the world. This is discussed in terms of what type of (sustainability) teaching and learning content the participant pays attention to as she or he experiences these positive affections. In other words, there are different pedagogies of the body related to sustainability (Hofverberg, Kronlid & Östman, 2017, p. 19).

The third tension to be identified as having implications for ESE is that between ecological (care for the material and/or resources), social (care for the craftsperson) and economic dimensions (affordable products). Two relevant questions that the tension raises are, which dimension(s) does the content focus on, and under what circumstances? The three sustainability dimensions also make it possible to address what craft products and processes emerge as important: is it the enduring quality of handicraft products (that often stands in contrast to the use of machines and cheaper production), or is it creativity as a matter of self-expression? The paper suggests that the answers to these questions are to be reflected on when discussing teaching and learning content when the activity of crafting is considered as ESE.

The findings of Paper I show that there are indeed many different possible contents of crafting when the activity is considered as ESE. When the pedagogy (educative purposes, acquired skills, and approaches to learning) of the contents is highlighted, differences in how the contents are materialised are made visible in terms of how students learn to relate to the material, to themselves, and to the environment.

6.2 Paper II: Recycling, crafting and learning – An empirical analysis of how students learn with garments and textile refuse in a school remake project

The aim of Paper II is to examine how students learn with garments and textile refuse when engaging in a remake project.

The examination of how students learn with crafting material and the findings from the PEA analysis conducted in Paper II identified three categories of relations. These three relations provide knowledge of how students learn with the material when they participate in a remake project. The first category is 'Transacting with the idea of a product'. The relations that analytically fill the identified gaps in the events are: deciding what to remake, describing and communicating what to remake, and transforming the idea into a product using the recycled material (Hofverberg & Maivorsdotter, 2017, p. 780). The second category is 'Transacting with a material's capabilities'. The relations that analytically fill the gaps in this category are identified as knowing a material's capabilities and how it can be used for a specific product (p. 780). The third category is 'Transacting with remake techniques', and the relations that analytically fill the identified gaps in the events are knowing how a pocket is constructed, knowing how and where the stitches are sewn, and knowing how to cut and measure the material to make the desired product. This also involves knowing how the recycled material can be used efficiently and coming up with suitable solutions (p. 780).

The findings also show what makes the learning process go in different directions – that is, what transactants emerge in the learning process – and this proves to be a variety of things. For example, Paul is – transactionally – making himself a creative person, as he wants to make a special product. In this example, the hugeness of the fabric emerges as a transactant, as it is the hugeness of the fabric that enables Paul to imagine a special product. In another example, Martin reveals that, because he will not use his pot holder, it does not matter to him whether the potholder is made out of fleece or not. The reason why Martin changes the fabric anyway is not because of what he knows about the fabric but rather the teacher's knowledge that fleece is not suitable for a potholder. Here, the transactant emerges as the teacher's knowledge about fleece. The paper concludes that, arguably, it is not possible to assume that a remake project always promotes learning for sustainable development but rather it is with how the teaching and learning processes develop and what emerges as important in the learning activities that are critical to acknowledge (pp. 787–788).

When the findings are discussed as implications for ESE, I conclude in the paper that it is not just for the student to remake or come up with any idea. The idea has to transact with the potential product in mind and the fabric *in situ*, which proves to be quite difficult given that the garments to be remade already have a form. Further, the future function of the remake product turns out to be relevant but is not something that can be taken for granted. For example, the paper explains Martin's view that remaking a new product does not necessarily mean that he will use the remade product later on. However, the teacher takes the future function of the product for granted, for example, if a student makes a potholder, it must withstand the heat without catching fire or melting. As she knows that material like fleece melts, using this material for a potholder does not make sense (pp. 782–784, 787). A third implication for ESE involves knowing how the recycled material can be used efficiently and coming up with suitable solutions. In one example from the paper, Oliver cuts the pair of jeans in a way he imagines will fit, but it is not straight, and this is irreversible (p. 787). However, the learning process continues and goes in a certain direction due to the 'wrong' cut. The choice to start again with a different material is usually not an option when remaking; thus, the student must learn to solve and adjust the remake process to the limited resources available (p. 787).

From the paper's empirical data, we can also see that the students and the teacher often argue for different ends-in-view, and thus the outcome is not self-evident. In other words, there is a tension in the crafting activity between aesthetic values and functional values. When the student argues for aesthetic values (see examples one and two, Paul and Martin, in Paper II), the teacher argues for functional values. Further, when the teacher argues for aesthetic values (example three, Oliver, in Paper II) the student argues for functional values. If the teacher and students have different values concerning what to do, this may be a challenge for what is actually taught and learnt.

6.3 Paper III: Human–material relationships in environmental and sustainability education – An empirical study of a school embroidery project

Paper III is an empirical study that aims to highlight the relevance of human–material relationships in crafting learning processes.

When the crafting material was examined in Paper III (i.e. how the embroidery thread participated in the learning process), the findings provided a description of the human–material correspondences. In particular, three human–material correspondences could be identified (Hofverberg & Kronlid, 2017, pp. 960–

962). The first correspondence to be identified was ‘attuning correspondence’. Here, when following the back-and-forth movement, the student and the thread had to adjust to each other’s forces. The example that provided this back-and-forth movement of attuning correspondence was the activity of threading the needle. Here, fingers had to adjust to the thread’s qualities (i.e. expansion and how the tread was spun), while the thread adjusts to the student’s fingers and saliva (p. 960). The second correspondence to be identified was ‘troubling correspondence’. As the human–thread correspondence emerged in the embroidery activity, knots easily appeared on the thread and inhibited (or blocked) the flow of the crafting process. Dealing with knots was a challenge that most of the students had to address in correspondence with the material (p. 961). The third correspondence to be identified was ‘tracing correspondence’. This correspondence was manifested when the student divided the thread in order to use a thinner embroidery thread or to combine colours (p. 962).

By focusing on the thread and what the thread was doing in the correspondence with the student, we gave a voice to the material through the use of footnotes that provide technical descriptions (p. 966). The students did not necessarily know how the thread was spun or why knots occurred on the thread, but they did experience the thread and they learnt to answer to the thread by attuning, troubling and tracing correspondences. In the paper, it is further argued that it is important to acknowledge the thread’s participation, because if we do not, there are limited possibilities to understand why something does, or does not, work as expected or what actually happens in the teaching and learning process of crafting (pp. 964–965). Based on the analysis, the relevance of scholarly attention to studies of human–material relationships in ESE and ESE research are further discussed (p. 965), specifically, how humans learn in human–material relations where materials are not simply a backdrop to human action but positioned to the core of learning for sustainable development and thus become a subject of inquiry and an agent of knowledge (p. 965).

6.4 Paper IV: Entangled threads and crafted meanings – Students’ learning for sustainability

The aim of the explorative study reported in Paper IV is to illustrate a research approach that shows what students and the material do in correspondence and what stories emerge from this activity.

The paper gives two illustrative examples of how the students created a design in correspondence with the material (p. 5) and two examples of how to realise

the design in correspondence with the material (p. 6). The stories that are recognised by the students are the material's texture, shape and construction. These stories emerge from the materiality intrinsic to the crafting process and the intentions of the students, as these are visible in action and both provide possibilities and set limits for what is possible to remake. For example, when Clair is working with the material to create a design, the correspondence emerges from the point where Clair feels the garments with her hands as she pats the fabric and then her fingers make the shape of a heart on the fabric. She also corresponds with a lace dress by using her arms to imagine how big the pillow should be. These correspondences help her design her remaking product, and the story about the material that emerges from these correspondences is the texture of the fabric. We see this in action when she continuously uses her hands to feel the fur and lace as she designs the pillow. Another example is Jonas, who has decided to make a pillow, but how to realise that idea proves quite difficult. In the correspondence, the jeans trouble Jonas because the shape of the jeans are wider on the upper side compared to the lower. The shape limits what he can do and makes Jonas doubt his first idea to make a square pillow. However, by continuing to correspond with the shape and the construction of the jeans (using both legs), these entanglements make it possible for Jonas to realise the final design and thus continue with the remake activity. The story about the material that emerges in this activity is the shape of the jeans.

In the paper, I show the reciprocal correspondence between the human and the material, and this is important for what stories are possible to learn in remaking activities. By applying a research approach of correspondence, I show what it is that the students recognise as they learn to join forces with the material and answer to the material in the remake project. In the paper, I explain that when students are given the opportunity, as the curriculum states, 'to develop knowledge of how to choose and handle materials in order to promote sustainable development' (SNAE, 2011b, p. 203), it is the embodied experiences of material's texture, shape and construction that the students learn to recognise as they learn for sustainability.

Remaking clothes is by no means a new activity; throughout history, clothes were seldom thrown away. In a final stage of the paper, I 'thread back' with the conjunctions with the past (Ingold, 2013) and argue that these examples of how the material is recognised have a bearing on the Swedish historical remaking practice (pp. 8–9). For example, historically, when remaking clothes, the craftsperson would have had to answer to the material and encounter the texture as well as the product's shape and construction, as these are inevitable when remaking. Further, by acknowledging historical threads in a remake activity, it is claimed in the paper that the activity can be regarded as having pedagogical opportunities that draw from the students' own

correspondences with the material. In the paper, I mention three complementary materiality concerns that threading back provides, namely, the source, the fabric and zero waste. I argue in the paper that these three materiality concerns make potentially relevant additions to the stories that the students make as they learn for sustainability, and they can be used by teachers to facilitate possibilities in a sustainability context and recontextualise old practices of remaking. At the end of the paper, I argue that learning to join forces with and correspond to materials can also open up for experiences that humans want to have in relation to environmental and sustainability issues. From this perspective, it becomes important to continue to create more empirically grounded knowledge concerning what materiality students recognise and how they – with their hands, skin, eyes, ears, bodies and minds – learn to correspond accordingly.

7. Discussion

The overall aim of the thesis is to contribute with new and deepened knowledge about the teaching and learning of craft when the crafting activity is considered as ESE. In this chapter, I first present a synthesis of the findings (7.1). Thereafter, I discuss the findings in relation to previous research (7.2). In the final subchapter, I suggest further research (7.3).

7.1 A synthesis of the findings

Firstly, when what is a possible ESE teaching and learning content of crafting is examined in the literature study (Paper I), the findings show that the recommended content of teaching and learning craft involve both crafting products (e.g. crafting long-lasting or functional products) and what one should learn in the crafting activity (e.g. being creative or knowledge of the whole crafting process). Thus, a craft content can be many things, and learning to craft cannot be considered to contribute to sustainable development without specifying how and with what one can achieve environmental and sustainability goals. For example, is it the product that is constituted as sustainable or is it the craftsperson's development or wellbeing that is acknowledged? One could claim that both provide a craft subject content relevant for ESE (objective one). Furthermore, the same content can be used in relation to different sustainability goals. For example, a content consisting of remaking a pair of jeans may result in students learning to craft long-lasting products and/or it may result in students learning to be creative that will enrich the craftsperson.

Secondly, I have explored and empirically examined the crafting process by creating three case studies to elaborate in more detail what constitutes a subject content of craft (objective one), what influences the learning process (objective two) and further how the crafting material participates in the learning process (objective three), when the crafting activity is considered as ESE. The findings from the case studies thus deepen our knowledge in regard to the findings from the first study concerning what constitutes a subject content of craft (objective one). The case studies show that, in a crafting activity, the student must manage many encounters with the material in

different stages of the crafting process. These encounters and the way the students handle them are crucial to acknowledge, as they produce an important learning content. Based on the findings from the case studies, I distinguish between two different contents, namely, a ‘product content’ and a ‘process content’. This is to distinguish a learning content as an outcome (the product content) from what students learn from the activity of learning this outcome (process content). For instance, if a student remakes a bag (product content), she or he will also learn things from the activity of remaking that bag (process content). However, a product content does not have to be a physical product – it can also be learning a skill, facts or a technique. For example, if a student should learn the skill to be creative, then the product content (i.e. the outcome) is ‘knowing how to be creative’ and the process content is that which a student learns in the activity in of becoming creative. My point by making this distinction is to acknowledge a content that emerges from the encounters the student makes in correspondence with the material, as these correspondences have implications for what the student learns when the crafting activity is considered as ESE. By acknowledging a process content, learning to ‘promote sustainable development’ (as stated in the curriculum of educational sloyd) is not solely about using eco-friendly materials and making environmental or sustainable products but also acknowledging that students are learning throughout the course – in the crafting activity. I will illustrate with an example: If a student makes an environmental product, say, by remaking a pair of jeans into a pillow, the student will need to imagine a new form, and with the material, create a design; in doing so, the student encounters and handles the material in the design and in the making. These correspondences and the experiences that emerge from these correspondences are not only about the product but also are likely to produce embodied experiences of how the material feels (i.e. ‘I like this’ or ‘I dislike this’) or emotions that prompt care regarding the material or frustration that can result in carelessness or ignorance about the material (i.e. ‘crafting is not for me’). In addition to this, the student will also learn that it is acceptable to cut a pair of jeans (even if they are not worn out, which was the case for some of the students in Paper II) and make a product from them in relation to specific purposes (i.e. to pass the course). All these aspects that emerge in the process and the crafting activity are, in fact, a content as well. If the ESE purpose of the craft activity is instrumentally focused solely on the products, this casual approach will limit the learning outcome and all the human-material relations that are made in the activity, as it neglects the embodied experiences of transactional relations that are produced in crafting activities, and thus, we, as both researchers and teachers, risk missing the important process content to be learnt.

By distinguishing ‘product content’ from ‘process content’, it is also possible to illuminate that a student can learn new things that are relevant for ESE from

the process, even if the product content is recognised as unsustainable. For example, learning with plastic materials is often considered as unsustainable due to the consequences plastic has for the planet.¹¹ However, even if the material is not sustainable, the student can nevertheless learn to be creative or to pay specific attention to materials from the process. Conversely, although the student may make a sustainable product, the process content may not be recognised as sustainable. Thus, by distinguishing the product content and process content, our knowledge of teaching and learning crafting when the activity is considered as ESE is deepened.

Thirdly, in the crafting process, there are many possible things that students need to manage, such as the potential product, the crafting material, institutional aims, or the teacher's ideas and suggestions. However, not everything is equally important. In the encounter of the purpose, the student and the material will together produce certain entanglements that will, in the learning process, emerge as more important, and here, the thesis empirically shows these transactants. In other words, it shows what influences the teaching and learning processes, which thus answers to objective two. What emerges as important has consequences for what is learnt and has implications for ESE, which I discuss in each paper. Here, what I want to acknowledge as a synthesised finding, is the *coming together* of the student and the material when they answer to each other in an activity with certain (and emerging) purposes. I consider this activity as 'threads' (the student and the material) coming from somewhere (the past) and heading somewhere (to an unknown future). The threads are entangled in the activity, as they are forced to adjust to each other and join forces, and as they do, produce and materialise socio-material relations. In other words, it is the coming together of the purpose (even if this purpose is emergent or changes during the process), the institutional aims (the assignment and the teacher's ideas), the specific boundaries that the material provides, and the student (with his or her past experience and ability to answer to the material) that produce and materialise socio-material relations. In other words, it is both the social and the material that together produce what is possible to craft. Further, this means that a product content and a process content are always materialised in socio-material relations.

Fourthly, by paying attention to how the material participates in these crafting processes (objective three), it is obvious that the material has a force in the learning process (i.e. when the socio-material relations are produced). Here, I would like to emphasise two things. Firstly, the material participates with its

¹¹ For example, recently published reports show that the oceans are overloaded with plastic and the report suggests that if we continue these patterns, there will be more plastic than fish in the oceans by 2050 (World Economic Forum, 2016).

materiality (how a thread is spun or how jeans are woven), which the students need to learn to answer to, work with, and handle (in a process of risk and certainty, cf. Pye [1968/2010]) as they become more skilful in handling the material. As the students learn to be more skilful, they have embodied experiences from answering to and joining forces with the material. This means that, although they might not be able to verbally express why the material acts the way it does from a technical point of view (for example, why the thread expands when cut or why certain fabrics need to have a zig-zag seam at the edges), they nevertheless learn how to respond to the material (for example, with fingers responding to the thread so it can successfully enter the needle's eye or handling a woven fabric that is falling apart). The second aspect I would like to emphasise is that, from the socio-material relations that are produced in correspondences, the material also participates in producing what stories the students will recognise. For example, in Paper IV, the shape, texture and constructions were recognised by the students. In other words, the material participates in what stories that are made and told.

Fifthly, the thesis provides theoretical and methodological tools to study how the material participates in the human–material relations. The development of a practice of correspondence that produces specific stories as well as the concept of transactant within the context of pragmatist learning theory have proven to be generative concepts when investigating the way that material and human action collaboratively constitute teaching and learning contents. Further, by developing theoretical and methodological tools, I have contributed with a didactical¹² language to talk about the teaching and learning of crafting in more detail. The concepts that I have used and contextualised in an educational context – correspondence, storying and transactant – highlight the material as an agent in the crafting activity. My hope is also that the terminology will help teachers and researchers acknowledge how the material is part of the learning process and that the material should not be neglected or taken for granted. By providing a perspective and didactical language that also highlights the material, my aim is to acknowledge the continuous back-and-forth correspondence between the students and the material – a correspondence that often opens up possibilities for teachers to highlight or introduce sustainability issues in the crafting process that students are involved in.

¹² Note that ‘didactical’ here refers to the discipline *Didaktik*, which centres on teaching and learning of a content in relation to a specific purpose, in this case, teaching and learning craft when the crafting activity is considered as ESE.

7.2 The findings' contribution to previous research

According to Borg (2008) and Lutnæs (2015), the purpose of the craft activity is important. This is confirmed by the findings from Paper I, which show that the same content may have different sustainability goals. Further, as the findings from Paper II show, the teacher and the student can have different ends-in-view; for example, the student wanted to make a special product and worked through that end-in-view, whereas, in the same activity, the teacher argued for another purpose, namely to make a doable product, thus showing the complexity of the teaching and learning situation. Consequently, a craft content can be contextualised within different purposes and be given different meanings and roles. The purpose of crafting and how it fulfils specific desirable aims is also highlighted by MacEachren (2000), who argues that, through crafting, students learn to reconnect with the earth. By empirically showing the interchanges that happen between the student and material, the thesis empirically illustrates in detail how the student and the material adjust and answer to each other in the whole crafting process – from the initial idea to the finished product. However, that these correspondences will provide certain outcomes, such as caring more for the environment or 'reconnecting' with the 'earth', is perhaps more questionable (although not impossible). The reason is because, in the learning activity, there are many transactants that influence the activity and thereby what the students will learn; a specific outcome cannot be taken for granted. For instance, students will recognise different stories with the material due to different prior experiences and due to the purpose, that emerges in the activity. A student might 'reconnect' with nature (although I would not describe it as a reconnection but rather as a different kind of connecting) as new stories (for the student) about the world she or he inhabits are made in correspondence. By making a distinction between a product and a process content, it is possible to show and discuss what students learn in more detail and also to show that a content can be contextualised within different purposes and be given different meanings and roles.

Much of craft research (Veeber, Syrjäläinen & Lind, 2015; Lepistö & Lindfors, 2015) focuses on the individuals' learning, and in particular, what the students learn as they participate in a creative crafting process; for instance, when crafting, students experience the world through their hands and express themselves through making something (Veeber, Syrjäläinen & Lind, 2015). In a creative crafting process, it is also argued that students should be allowed to make decisions for themselves instead of being passive recipients of the information delivered by the teacher (Lepistö & Lindfors, 2015). This content of working creatively in a learning-by-doing process is similar to what the Danish teachers expressed when working with waste using artistic expressions, namely, that it supports children's fantasy, ingenuity and

creativity (Jørgensen, Madsen & Læssøe, 2018, p. 811). Thus, one major purpose that one can draw from educational craft research is that creativity is emphasised as a learning content. Here, I would like to make a point by drawing on my findings. In the remake project of Papers II and IV, the students were asked to creatively remake old clothes into new products, which meant that the students should first come up with ideas of what to remake and then come up with solutions for how to realise their design. The task reflects a learning-by-doing pedagogy. However, the sustainability norms that emerge in the teaching and learning activity of the remake project, such as working with limited resources, making useful products, or knowing a specific craft technique, relate more to an expert-oriented pedagogy, as there are certain methods to how these are done, for example, a crafting technique for how to cut a pair of jeans straight or the knowledge that a potholder cannot be made out of fleece. My point is that many of the norms of sustainability that are associated with remake projects are related to certain ways of doing things, whereas much craft research and the remake practice, like that of educational sloyd, emphasise a learning-by-doing pedagogy (such as creativity and innovation activities in which the students make decisions for themselves and come up with solutions themselves). This, in turn, can produce contradictions in the teaching and learning activity. In Paper II, for example, a tension of aesthetic and functional values emerged. What this shows – and contributes to previous research – is that when the crafting activity is considered as ESE, the complexity of the teaching and learning deepens. No longer is the aim only about the students' creativity, but it is also about students' learning in socio-material relations that connect to wider sustainability and environmental issues. This has consequences for a remake pedagogy. Further, previous research (Veeber, Syrjäläinen & Lind, 2015; Lutnæs, 2015) theoretically argues for how crafting connects to wider sustainability and environmental issues and the need to critically discuss them (Lutnæs, 2015; Boehnert, 2015). Here, the thesis adds by empirically showing what tensions teaching and learning craft can produce and how the pedagogy is of particular importance, especially when the product and the process content are taken into consideration.

Odegard's (2012) research shows through creating focus groups with teachers that, in a remake project, the material's properties guide the remaking process. She also argues that the teacher influences the teaching and learning content by expecting a product. The analyses from the remake case studies (see Papers II and IV) empirically confirm that both the teacher and the material participate in the remake project. This means that the material and the teacher have a possible impact on how the learning process develops. By focusing on the student–material relation in a remake project, I argue that learning is not starting to act but rather learning to inhabit the world differently and learning to answer to the material differently, and thus, one learns new (and old) stories

about a crafted world and one's place in it. These stories are consequently affected by both the material and the teacher.

As students learn these stories, opportunities open up for students to learn to act on environmental and sustainability issues, for example, as von Busch (2013) explains, students can reclaim and expand the room for personal engagement with everyday objects and culture. What I find interesting with von Busch's (2013) proposal is that, by knowing a handicraft, students are invited to take action on environmental and sustainability issues not just by thinking about environmental and sustainability issues or arguing for a particular stance in a classroom but also, as Busch highlights, that by knowing crafting, a person becomes a maker, which opens up for new ways of participating in a society that are not solely about being a consumer (cf. Veeber, Syrjäläinen & Lind, 2015). However, when education opens up for a diversity of actions (in the classroom), research also shows the importance of critically thinking about who (the child or the adults) is given responsibility and what actions are constituted as characterising responsible citizens (Ideland & Malmberg, 2015). For example, by remaking a pair of jeans – an object for environmental and sustainability re-orientations in a remaking project – sustainable development is no longer simply about a polar bear (a common symbol of climate change) far away, but it actually matters if, and how, the student cuts the pair of jeans. Given that the remake project is related to the re-orientation of how humans overuse resources, the actual act of how to remake clothes is not only about the student but also her or his re-orientation to live more sustainably in the world. A didactical question that emerges when a pair of jeans becomes an object for environmental and sustainability re-orientation, is how the socio-material relations in the teaching and learning activity produce a narrative of guilt and responsibility (Ideland & Malmberg, 2015). These questions are not explored in the thesis, but need to be addressed as part of the story that students learn, especially if the activity of how to choose and handle materials is constituted as promoting sustainable development (as stated in the curricula of education sloyd).

Educational craft research has shown that the body (Ekström, 2012; Frohagen, 2016; Sigurdsson, 2014), tactile sensitivity (Andersson & Johansson, 2017) and emotions (Westerlund, 2015) influence the learning process. Further, Illum (2006) as well as Illum and Johansson (2009) pay specific attention to what they define as a dialogue in process. By taking a materiality perspective, the thesis adds to this embodied learning activity, in particular, by empirically showing how the crafting material, such as a thread, participates in the crafting dialogue (see Paper III). A materiality perspective and how more-than-human are part of educational relations are also important in ESE research (Somerville, 2016). However, humans have always learnt in socio-material relations, and materials have always participated in the teaching and learning

of craft. The question in focus for this thesis is not *if* a material participates in the process, but rather *how* crafting materials comes to matter in teaching and learning activities (cf. Barad, 2003) and how students are entangled in what Ross and Mannion (2012) define as a larger mesh. By providing research tools when examining the activity of crafting, such as using a practice of correspondence, stories, and transactant, I contribute to ESE research that emphasises different materiality perspectives (Van Poeck & Lysgaard, 2016). I have examined crafting activities with a specific focus on the crafting material, but the concepts of correspondence, stories and transactant can also transfer to other ESE learning activities where different kinds of materials are important. If one thinks about every activity as a coming together of different transactants that are developing and changing, ESE (in particular, how learning activities materialise specific socio-material relations) could perhaps benefit from being addressed as a crafting process and understood as a process of correspondence in an activity. By doing so, in addition to the purpose of the activity, the process content becomes an important content to take into consideration. This suggestion provides many different human–material engagements, such as consumption, travelling, recycling, as well as using ESE as ‘crafting’ sustainable ends (even if these ends are emerging and unknown). Thus, the relational socio-material approach may acknowledge and highlight that sustainable development is not only a vision but also something ‘crafted’, and ‘crafting’ sustainable development emerges in new forms of correspondence.

7.3 Future research regarding ESE and crafting activities

This thesis has sought to contribute to ESE and ESE research by focusing on the teaching and learning of craft when the activity is considered as ESE. I have argued that both product content and process content are important in crafting activities, that the material participates in the teaching and learning activity to a great extent, and that a content always produces socio-material relations. The nature of the thesis is empirical and also explorative and more research is further needed that can continue to add valuable insight into socio-material relations within crafting activities and ESE. For example, more empirical research on crafting activities in educational sloyd is needed – research which can expand on the process content of ESE and what transactants that emerge in the correspondences of the learning activity. In addition, the socio-material focus of the thesis has also given rise to new research questions. In particular, I would like to mention three research areas that connect to my research.

The first research area concerns *the digital and the analogue* in crafting or making activities. The ‘digital era’ has profoundly changed our society and

will likely continue to do so (for example, with Artificial Intelligence, which requires new demands and challenges for education). Today, ideas from the makers' movement are argued to be important for STEM subjects (science, technology, engineering and math), as they provide students with the knowledge and skills needed for 'the future' (Martinez & Stager, 2013). Regarding this, I wonder what those 'future' skills will be and how they will materialise socio-material relations, for example, what stories are 'crafted' about sustainable development as students learn to make and create new things through making? To answer this, we need more empirical research to understand what the process content is in these human-material correspondences and what this means for ESE. One relevant research topic that I view as worthy to explore further is to determine when digital crafting is preferable to analogue, and likewise, when analogue crafting is preferable to digital and what socio-material relations the digital/analogue process contents produce. Relating the digital and the analogue to educational sloyd, this includes an interesting correlation to the time aspect because when educational sloyd was first implemented in Sweden, only analogue crafting materials were being used (e.g. wood, metal and textiles). What I find interesting is that, although the purposes of the subject have changed (Borg, 2008), the materials are still more or less constant. What does this *do* to the subject content in educational sloyd? I am not arguing for a change, but rather my point is to acknowledge the socio-material relations and how they are entangled with ideas about digital/analogue crafting and certain understandings about 'futures', technologies or gendered expectancies.

The thesis has focused on the teaching and learning content and what influences the teaching and learning processes, which are two important didactical questions. In addition to these two questions, a further relevant question from a didactical point of view is how a specific teaching content, for example a remake project, produces expectations of how students should act or behave in relation to this specific teaching content (cf. Ideland & Malmberg, 2015). For example, what transactional behaviours, identities or subject positions are considered 'sustainable' in the remake projects of educational sloyd? The results of the thesis show that there are tensions in educational sloyd related to these matters (for example a tension of aesthetic and functional values) and also in crafting activities in general when the activity is considered as ESE (see Paper I). Hence, a relevant research question that emerges from these findings is to further trace how a teaching content is made and understood in an ESE practice for example by using the analytical framework of 'knowledge-making moves' (Danielsson, Berge & Lidar, 2018). The question, *what transactional behaviours, identities or subject positions are considered 'sustainable'?* also sheds light on other possible sustainability behaviours, identities or subject positions. For example, examining local knowledge or indigenous knowledges (Shava, 2010) about crafting and a

‘crafted’ world in Sweden (and elsewhere), could provide new insights on this matter. In particular, exploring the intergenerational spheres with a specific focus on the materiality (Mannion, 2018) would be relevant and to pay further attention to the tensions between the individual and the collective or between aesthetics and functional values and how they are experienced in different educational practices, local cultures and generations. By taking an intergenerational approach on these questions could provide new insights for the teaching and learning of craft when the crafting activity is considered as ESE.

The thesis also suggests that we, as humans, have always been in correspondence with materials, although we may not have always been aware of it. Therefore, a relevant further research area would be to backtrack through what kind of human–material relationships are found in unsustainable societies. In addition, if we are *always* in human–material correspondence, the human–material correspondence is not only relevant for educational crafting practices but also for many different educational actors to consider in both formal and informal education. For example, how does a city deal with its waste? What stories does it communicate about its citizens, and how are human–material correspondences part of such a story? By centring on the human–material relation in these stories in a practice of correspondence, many interesting areas emerge, which are relevant to examine further in relation to public learning, public pedagogy and the collective knowledge of a society.

8. A summary in Swedish

8.1 Kort sammanfattning av avhandlingen

Det övergripande syftet med avhandlingen är att bidra med ny och fördjupad kunskap om undervisning och lärande när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning (på engelska: environmental and sustainability education, ESE).

Människor har alltid gjort saker och hantverkat med material. Historiskt sett definieras ofta en tidsålder utifrån vilket material som i huvudsak används, till exempel stenåldern eller bronsåldern. Dagens tidsålder definieras dock inte av ett visst material. Snarare har termen "antropocen", vilket betyder "mänsklighetens expansion" (Crutzen och Stoermer, 2000), gradvis accepterats som definition på vår tid (Johnson och Morehouse, 2014). Som ett svar på "mänsklighetens expansion" och den överkonsumtion av naturresurser som kan relateras till det antropocena, framförs ofta hantverk och återbruksprojekt som ett undervisningsinnehåll i miljö- och hållbarhetsutbildning. Exempelvis är det just att arbeta med (återbruks) material som kursplanen i skolslöjd beskriver som viktigt när elever lär sig främja en hållbar utveckling (Skolverket 2011, 213). Dock är det inte självklart vad innehållet i undervisningen och lärandet är när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning eller hur en sådan undervisning skall gestaltas. För att bidra med kunskap om undervisning och lärande, när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning, har tre delsyften formulerats: (1) Att undersöka vad som utgör ett slöjdamnes innehåll relevant för miljö- och hållbarhetsutbildning. (2) Att undersöka vad som influerar och påverkar lärandeprocessen när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning. (3) Att undersöka hur slöjdmaterialet deltar i lärandeprocessen när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning.

Teoretiskt bygger avhandlingen på Ingolds (2013) teori om "slöjdande" ('making'), som han benämner på engelska som 'practice of correspondence' och på Ingolds (2011) teori om berättelser som involverar hela människan. Vidare används Deweys (1938/1997) transaktionella teori om

meningsskapande, vilken också situerar avhandlingen i en didaktisk¹³ kontext. Enligt Ingold så utövar människor inte slöjdande på material, snarare är slöjdaktiviteten en process där människa och material sammanlänkas och svarar upp mot varandra i en aktivitet av korrespondenser ('practice of correspondence'). Även om materialets deltagande ofta erkänns teoretiskt är risken att materialets deltagande försvinner empiriskt till förmån för pedagogiska syften (Sørensen, 2009). För att undvika denna risk använder jag teorier och metoder som tar hänsyn till slöjdmaterialets deltagande i lärandeaktiviteten. I en 'practice of correspondence' konstituerar eleven och materialet varandra, och det meningsskapande som produceras i aktiviteten benämns i avhandlingen som berättelser. Jag utvecklar också ett teoretiskt och analytiskt begrepp 'transaktant' som hjälper mig att undersöka hur både människor och material, eller andra viktiga komponenter, deltar i undervisnings- och lärandeprocessen.

Avhandlingen utgörs av fyra artiklar. Den första artikeln är en explorativ studie som identifierar ett möjligt undervisnings- och lärandeinnehåll när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning. Detta görs genom kvalitativa textanalyser med fokus på innehållet (Säfström & Östman, 1999) i texter från och om tre motståndsrörelser (från 1900, 1968 och 2017). De tre motståndsrörelserna valdes ut då de alla på ett eller annat sätt menar att slöjdande bidrar till en mer hållbar framtid. Totalt analyseras sju olika praktiker. I textanalyserna undersöks: 1) Vad som är syftet med att lära sig slöjda/hantverka. 2) Vilka förmågor som värderas för att uppnå syftet. 3) Vilket didaktiskt undervisningssätt som framträder för att uppnå syftet. För att synliggöra didaktiska likheter och skillnader diskuteras därefter resultatet, vilket definieras som en teoretisk konstruktion av ett möjligt undervisnings- och lärandeinnehåll, med hjälp av fyra utbildningsfilosofier (Englund, 1997). I ett tredje och sista steg diskuteras konsekvenser för miljö- och hållbarhetsutbildning.

Artikel II – IV bygger på observationer av slöjdaktiviteter, vilka gjorts under en termin (80min/vecka) i ett slöjddklassrum i årskurs 8 i Sverige. Två projekt filmades, ett återbruksprojekt och ett broderiprojekt. I återbruksprojektet gjorde eleverna nya produkter av gamla kläder och återbrukade textilier. Empirin från återbruksprojektet användes både i artikel II och IV. I artikel II användes Praktisk epistemologisk analys (PEA) (Wickman och Östman, 2002) för att undersöka hur lärandeprocessen gick till. Vidare användes 'transaktant' som ett teoretiskt begrepp (förklarande) och analytiskt begrepp (identifierande) för att specifikt visa vad som fick lärandeprocessen att ta en

¹³ Didaktik som forskarämne fokuserar på undervisning och lärande av ett innehåll i relation till ett specifikt syfte, i detta fall undervisning och lärande av slöjdande när slöjdaktiviteten konstitueras som miljö- och hållbarhetsundervisning (ESE).

viss riktning. I artikel IV, användes 'a practice of correspondence' för att undersöka korrespondensen mellan elev och material. Vidare undersöktes vilka berättelser om materialet som eleverna kände igen när de designade och skapade nya produkter av återbruksmaterialet. I artikel III studerades broderiprojektet där analysen fokuserade på hur slöjdmaterialet, i detta fall broderitråden, deltog i elev-material relationerna. Genom att inspireras av Sørensens (2009) observationskoncept: 'participation, performance and imagination', kunde trådens deltagande visas empiriskt i de elev-material relationer som uppstod i slöjdaktiviteten.

Resultaten från artikel I visar att det finns många olika möjliga innehåll i hantverksaktiviteten när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning. Produkter som är långvariga, funktionella, varaktiga, vackra och som synliggör handens arbete eller uttrycker politiska åsikter är alla exempel på miljö- och hållbarhetsprodukter. Men själva processen kan också betraktas som ett innehåll vilket då exempelvis pekar på ett ifrågasättande av en slit-och-släng kultur eller överkonsumtion; eller pekar på användandet av metoder och verktyg som alla kan använda; eller på slöjdande som ett medel för att bli självförsörjande; eller på behovet av att känna till hela slöjdprocessen (vilket också innebär att man kan laga produkterna). När det didaktiska innehållet av undervisningen analyseras (undervisningens syfte, vilka förmågor som värdesätts i relation till detta syfte samt hur lärandet gestaltas i relation till syftet) framträder skillnader. I synnerhet identifieras tre spänningar:

Den *första* spänningen utgörs av spänningen mellan ett individuellt och ett kollektivt perspektiv. Med andra ord blir frågan om undervisningen ska syfta till att utveckla en individ eller ett kollektiv. Frågan väcks också vem som inkluderas i det 'individuella' (klass, kön, rik/fattig). Men också vem som inkluderas i det kollektiva (vilka människor, djur, natur). Och vilken nivå av hantverksskicklighet krävs för att något ska betraktas som hållbart. Den *andra* spänningen utgörs av slöjdarens förkroppsligade erfarenheter och dessas relation till världen. Till exempel: Hur tolkas och upplevs glädjen av att kunna slöjda? Kommer tillfredsställelsen av att kunna skapa, och/eller göra högkvalitativa produkter, och/eller skapar slöjdande något slags bredare, socialt och delat välbefinnande? Beroende på hur den kroppsliga erfarenheten tolkas kan den peka mot olika och ibland också motsägelsefulla miljö- och hållbarhetsmål. Den *tredje* spänningen utgörs av spänningen mellan de ekologiska, sociala och ekonomiska dimensioner som också ingår i definitionen av hållbar utveckling. Till exempel: är målet främst att spara resurser (ekologisk dimension), värna om slöjdaren (social dimension) eller att producera billigare produkter (ekonomisk dimension)? Vilka miljö- och hållbarhetsmål som slöjdande ska bidra till påverkar alltså vilket innehåll i undervisningen som premieras.

Resultaten från artikel II visar att hur eleverna lär sig att återbruka är en komplex process. Vad eleverna lär sig är därför relaterat till hur slöjdande görs. Det innebär också att återbruksprojekt inte per automatik bidrar till att främja miljö- och hållbarhetsaspekter. Istället måste lärandeprocessen beaktas för att förstå vad eleverna lär sig. När frågan om hur eleverna lär sig studeras empiriskt så visar resultaten från återbruksprojektet att eleverna måste hantera och transagera med idéer om en återbruksprodukt, med materialets egenskaper och med olika hantverkstekniker. Dessa tre kategorier är i sig komplexa men fördjupas ytterligare när undervisningen och lärandet ges ett miljö- och hållbarhetsinnehåll. Till exempel är det inte tillräckligt att bara ha en idé om vad som ska produceras. Idén måste transagera med en potentiell produkt som inom ramen för uppgiften är möjlig att göra och med det återvunna tyget (dess form, material och kvalitet). Varför en produkt återbrukas handlar inte enbart om huruvida den visualiserade produkten motsvarar vissa mänskliga preferenser, utan resultaten visar att den visualiserade produkten också gör något med eleven när han eller hon slöjdar. Till exempel blir Paul – i det transaktionella mötet med materialet – en kreativ person som vill göra en speciell produkt. I exemplet blir det stora tyget det som Paul vill återbruka och det stora tyget gör att han kan föreställa sig sin tänkta produkt. Medan en annan student, Martin, hävdar att eftersom han inte kommer att använda sin grytlapp spelar det ingen roll om den är gjord av fleece, som inte är värmebeständigt. Martin blir – i de transaktionella mötet med materialet – ovillig att acceptera vad läraren tar för givet, nämligen att produkten ska vara användbar. Med andra ord gör den visualiserade produkten något med processen och påverkar vad eleverna gör i återbruksprojektet, och även hur. Vidare, när undervisnings- och lärandeprocessen i slöjdande betraktas som en fråga om miljö och hållbarhet, fördjupas komplexiteten på grund av att återbruksprojektet också handlar om begränsade resurser. Valet att starta om igen med ett annat material finns ofta inte. Eleven och läraren måste då istället lära sig att lösa och anpassa processen utifrån de begränsade resurser som finns tillgängliga (och med de fel som eventuellt kan ha uppkommit). Men inte bara det. Studenten och läraren har dessutom ofta olika mål i sikte vilket gör att vad som ska slöjdas och hur det ska göras inte alltid är givet. Snarare tydliggör det empiriska materialet en spänning mellan estetiska värden och funktionella värden. Exempelvis när eleven argumenterar för estetiska värden (exempel ett och två, i artikel II) argumenterar läraren för funktionella värden. Men när eleven argumenterar för funktionella värden argumenterar läraren för estetiska värden (exempel tre i artikel II). Vidare går det också att urskilja en spänning mellan en 'learning-by-doing' didaktik och en expert-orienterad didaktik. Själva återbruksprojektet kan sägas vara en 'learning-by-doing' didaktik, då eleverna ska komma på vad de ska göra och hur de ska göra dessa produkter. Men de normer som återbruksprojekt ofta förknippas med, exempelvis att de ska vara användbara och att man ska veta hur produkter slöjdas för att hålla, relaterar istället till en mer expert-orienterad didaktik.

Detta gör att det i praktiken kan uppstå en spänning mellan dessa två didaktiska undervisningssätt.

Resultaten från artikel III visar hur hantverksmaterialet, i detta fall broderitråden, deltar i slöjdundervisningen och lärandet. När det är tydligt att tråden gör något i korrespondensen uppmärksammas detta i den empiriska beskrivningen genom fotnoter. I fotnoterna ges en teknisk beskrivning av vad tråden gör och därmed också en möjlig förklaring till trådens deltagande. Av resultaten kan man dra slutsatsen att eleverna inte agerar på passivt material, utan de lär sig att handla med materialet på åtminstone tre sätt. I den första korrespondensen (attuning correspondence) kommer eleven i en slags samklang med tråden och därmed uppnås vad hen vill åstadkomma (att trä på nålen på tråden). I den andra korrespondensen (troubling correspondence) möter eleven motstånd och måste börja om igen med hjälp av läraren (när det är knutar på tråden). I den tredje korrespondensen (tracing correspondence) följer läraren och eleven tråden och lägger särskild uppmärksamhet på vad tråden gör och hur den svarar mot deras handlingar (när tråden delas). Materialet, så som tyget (hur det är vävt), tråden (spunnen på ett visst sätt) och de funktioner de tillsammans med eleven producerar i broderiaktiviteten både begränsar och möjliggör vad som kan skapas och slöjdas. Vidare diskuteras det i artikeln vilka konsekvenser en korrespondensteori kan få när materialet ges utrymme som medskapare av aktiviteten, dels i slöjdande men också generellt i miljö- och hållbarhetsundervisning.

Resultaten från artikel IV visar vilka berättelser om materialet som eleverna känner igen i mötet med återbruksmaterialet. I artikeln ges två illustrativa exempel på hur eleverna skapar en design tillsammans med materialet och två exempel på hur eleverna realiserar designen. I analysen tydliggörs de berättelser som eleverna känner igen, vilka är: materialets struktur, materialets form och materialets konstruktion. När Clair exempelvis arbetar med materialet för att skapa en design av en kudde framträder korrespondensen genom att: hon känner på tygerna med händerna, hennes fingrar formar ett hjärta på ett pälstyg och hon använder också sina underarmar för att mäta på en spetsklänning hur stor kudden ska vara. Dessa korrespondenser hjälper henne att designa kudden och den berättelse om materialet som framträder handlar främst om textiliernas struktur. Ett annat exempel är Jonas, som har bestämt sig för att göra en kudde, men hur han ska kunna göra den av ett par jeans visar sig vara svårt. I korrespondensen uppstår ett problem eftersom formen på jeansen är bredare på den övre delen av jeansbenet jämfört med på den nedre delen. På så sätt begränsar formen vad Jonas kan göra och han börjar tvivla på sin första idé att göra en kvadratisk kudde. Men genom att fortsätta mäta jeansen och använda båda benen framträder en möjlig design för Jonas. Den berättelse som Jonas känner igen i den här aktiviteten handlar om jeansens form. I artikeln visar jag den ömsesidiga korrespondensen mellan

eleverna och materialet. Detta blir viktigt i relation till vilka berättelser om materialet som blir möjliga för eleverna att lära sig i återbruksaktiviteten. Återbruksprojekt är inte på något sätt en ny aktivitet i Sverige utan kläder har lappats, lagats och tyger har alltid återanvänts på olika sätt. I artikeln görs en historisk tillbakablick gällande vilka berättelser som mötet med material i en vidare återbrukspraktik kan möjliggöra. Det konstateras att alla de tre berättelserna som framkom i analysen har en sammanlänkning med en historisk återbrukspraktik. Vidare beskrivs ytterligare tre berättelser nämligen: om materialets ursprung (source), om tygets kvalitet (fabric) och om att inget spillmaterial produceras (zero waste). I artikeln diskuteras dessa berättelser ytterligare som möjliga kroppsliga erfarenheter med material när återbruksprojektet ses som en del av en större återbrukspraktik.

8.2 Avhandlingens syntetiserade resultat

Det syntetiserande resultatet från alla fyra artiklarna kan sammanfattas i fem punkter:

För det första visar resultaten att ett rekommenderat innehåll i undervisning och lärande kan vara en mängd saker när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning. Det innebär att vad man menar med slöjdande för hållbar utveckling bör förtydligas och även hur undervisningen är tänkt att gestaltas. I synnerhet när samma slöjdinnehåll kan användas i förhållande till olika hållbarhetsmål.

För det andra, när slöjdande undersöks empiriskt så fördjupas förståelsen av hur undervisnings- och lärandeinnehållet görs och blir till när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning. Här gör jag skillnad på ett produktinnehåll (exempelvis en väska) och ett processinnehåll (vad studenten lär sig från processen när väskan görs). Ett produktinnehåll behöver dock inte bara vara en fysisk produkt, det kan också vara att lära sig en färdighet, fakta eller en teknik. Till exempel om produktinnehållet är att lära sig att vara kreativ, blir processinnehållet det studenten lär sig i processen när hen övar och lär sig att vara kreativ. Genom att synliggöra processinnehållet handlar slöjdande, när det görs till en fråga om miljö- och hållbarhetsundervisning, inte bara om att använda miljövänliga material och göra miljövänliga eller hållbara produkter, utan processinnehållet synliggör också vad eleverna lär sig i mötet med materialet i slöjdandet. Vidare, genom att skilja på 'produktinnehåll' och 'processinnehåll' är det också möjligt att belysa att en elev kan lära sig nya saker från processen som är relevanta för miljö- och hållbarhetsundervisning, även om produktinnehållet inte anses vara hållbart. Till exempel anses slöjdande med plastmaterial ofta vara ohållbart på grund av konsekvenserna som plast har på planeten. Men även om materialet inte är

hållbart kan studenten lära sig att vara kreativ eller att ägna särskild uppmärksamhet åt materialet, vilket ofta lyfts fram som två viktiga förmågor inom miljö- och hållbarhetsforskning (se kapitel 2 i avhandlingen). Men även omvänt, även om studenten gör en hållbar slutprodukt kan processinnehållet visa sig inte vara hållbart. Genom att särskilja produktinnehållet och processinnehållet fördjupas därmed vår kunskap om undervisning och lärande när slöjdande betraktas som miljö- och hållbarhetsundervisning.

För det tredje finns det många saker och många relationer som eleverna behöver hantera när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning. Avhandlingen visar empiriskt vad som blir framträdande i själva görandet och i avhandlingens olika artiklar diskuteras vilka implikationer det kan få när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning. En syntetisering av resultatet som kan göras utifrån dessa diskussioner är att i aktiviteten skapas socio-materiella relationer, vilket innebär att vad som helst inte blir möjligt att göra. Istället producerar och materialiserar både det sociala och det materiella vad som blir möjligt att slöjda. Exempelvis, specifika syften (även om syftet blir till eller ändras under aktiviteten), det institutionella (ramar för uppgiften, betygskriterier eller lärarens idéer), materialet (både begränsningar och möjligheter) och eleven (tidigare erfarenheter och förmågan att svara upp mot materialet) skapar tillsammans socio-materiella relationer och ger förutsättningar för vad som blir möjligt i slöjdande.

För det fjärde så uppmärksammar avhandlingen hur materialet deltar när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning. Det första jag vill poängtera är hur det fysiska materialet deltar, det vill säga, dess materialitet (hur en tråd är spunnen eller hur ett par jeans är vävda). Den fysiska materialiteten behöver eleverna lära sig arbeta med och hantera för att bli skickligare i slöjdande. Det betyder dock inte att eleverna nödvändigtvis vet varför materialet agerar som det gör (till exempel varför tråden expanderar när den klipps eller varför vissa tyger behöver ha en sicksack söm i kanterna), men de får kroppsliga erfarenheter genom att hantera materialet (fingrar som kommer i samklang med en tråd, eller fingrar som kan hantera ett tyg så att det inte rispå upp). Det andra jag vill poängtera, gällande hur materialet deltar när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning, är hur materialet också både möjliggör och begränsar de berättelser som blir möjliga för eleverna att lära sig om miljö och hållbarhet. Det vill säga att materialet också är en medaktör när eleverna lär sig miljö- och hållbarhetsberättelser.

För det femte ger avhandlingen teoretiska och metodologiska verktyg för att studera relationerna mellan människor och material. Användandet och utvecklingen av 'a practice of correspondence', vilka berättelser som skapas och begreppet transaktant (inom ramen av en transaktionell lärandeteori) har

visat sig vara generativa begrepp om man vill undersöka hur material och mänsklig handling tillsammans utgör och samspelar i undervisning och lärande. Vidare har jag, genom att använda och i viss mån också utveckla dessa teoretiska och metodologiska verktyg, bidragit med ett slöjddidaktiskt språk. Det slöjddidaktiska språket hoppas jag kan vara användbart när forskare, lärare eller andra intresserade pratar om undervisning och lärande och i synnerhet när slöjdande görs till en fråga om miljö- och hållbarhetsundervisning.

References

- Adamson, G. (2007). *Thinking through craft*. London: Bloomsbury.
- Adamson, G. (Ed.). (2010). *The craft reader*. Oxford and New York: Berg.
- Adamson, G. (2013). *The invention of craft*. London: Bloomsbury.
- Affifi, R. (2014). Drawing analogies in environmental education. *Canadian Journal of Environmental Education*, 19, 80–93.
- Affifi, R. (2017). The metabolic core of environmental education. *Studies in Philosophy and Education*, 36(3), 315–332.
- Almqvist, J. (2005). *Learning and artefacts. On the use of information technology in educational settings*. Doctoral thesis, Uppsala University.
- Andersson, J. (2014). *Kroppsliggörande, erfarenhet och pedagogiska processer. En undersökning av lärande av kroppstekniker* [Embodied experiences and pedagogical processes: An investigation of learning embodied techniques]. Doctoral thesis, Uppsala University.
- Andersson J., & Johansson, M. (2017). Learning situations in sloyd – To become more handy, dexterous and skilful. *Techné Series A: 24*(2), 93–109.
- Andersson, J., Garrison, J., & Östman, L. (2018). *Empirical philosophical investigations in education and embodied experience*. Cham: Palgrave Macmillan.
- Barad, K. (2003). Posthumanist performativity: Toward an understanding of how matter comes to matter. *Signs: Journal of Women in Culture and Society*, 28(3), 801–831.
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham, NC: Duke University Press.
- Bennett, J. (2010). *Vibrant matter: A political ecology of things*. Durham, NC: Duke University Press.
- Bennett, J. (2013). Eco-sensibilities: An interview with Jane Bennett. In Watson, J. *The Minnesota Review*, 81, 147–158.
- Boehnert, J. (2015). Ecological literacy in design education. A theoretical introduction. *FormAkademisk – Research Journal of Design and Design Education*, 8(1), 1–11.
- Bogost, I. (2012). *Alien phenomenology. Or what it's like to be a thing*. Minneapolis: University of Minnesota.
- Borg, K. (2001). *Slöjdämnet: intryck – uttryck – avtryck*. [Educational sloyd: Insight, expression, imprint]. Doctoral thesis, Linköping University.
- Borg, K. (2008). Slöjdämnet – Alla dessa slöjdpåsar. [Educational sloyd: All these sloyd bags]. In *Slöjd vidgar perspektiven KRUT: Kritisk utbildningstidskrift*, 133/134(1–2), 16–26.
- Braidotti, R. (2013). *The posthuman*. Cambridge: Polity Press.
- Brameld, T. (1950). *Patterns of educational philosophy. A democratic interpretation*. New York: World Book Company.
- Brinkmann, S. (2015). GOFQI and the phoenix of qualitative inquiry. *Qualitative Inquiry*, 21(7), 620–622.

- Bryant, L. (2014). *Onto-cartography. An ontology of machines and media*. Edinburgh: Edinburgh University Press.
- Clarke, D. A. G., & Mophie, J. (2016). From places to paths: Learning for sustainability, teacher education and a philosophy of becoming. *Environmental Education Research*, 22(7), 1002–1024.
- Coole, D., & Frost, S. (Eds.). (2010). *New materialisms. Ontology, agency and politics*. Durham, NC: Duke University Press.
- Crociata, A., & Mattosio, N. (2015). Output-orientated data envelopment analysis for measuring recycling efficiency: An application at Italian regional level. *Environmental Education Research*, 22(4), 551–570.
- Crutzen, P. J., & Stoermer, E. F. (2000). The Anthropocene. *IGBP Newsletter*, 41(17), 17–18.
- Cummins, S. (2010). Why craft now? Here's what they said. *American craft council*. Retrieved from: <https://craftcouncil.org/post/why-craft-now-heres-what-they-said>
- Danielsson, A.T., Berge, M., & Lidar, M. (2018). Knowledge and power in the technology classroom: a framework for studying teachers and students in action. *Cultural Studies of Science Education*, 13(1), 163–184.
- Dewey, J. (1929/1984). The quest for certainty: A study of the relation of knowledge and action. In Boydston, J.A. (Ed.), *The Later Works, 1925–1953*, 4. Carbondale: Southern Illinois University Press.
- Dewey, J. (1938 /1997). *Experience and education*. New York: Touchstone.
- Dewey, J., & Bentley, A. F. (1949/1991). *Knowing and the known*. Boston, MA: Beacon Press.
- Dryzek, J. (1997). *The politics of the earth*. Oxford: Oxford University Press.
- Ekström, A. (2012). *Instructional work in textile craft: Studies of interaction, embodiment and the making of objects*. Doctoral thesis, Stockholm University.
- Englund, T. (1986/2005). *Läroplanens och skolkunskapens politiska dimension*. [Curriculum as a political problem]. Göteborg: Bokförlaget Daidalos AB.
- Englund, T. (1997). Undervisning som meningserbjudande [Teaching as meaning-making]. In Uljens, M. (Ed.), *Didaktik: teori, reflektion och praktik*. [Didactic: theory, reflection and practice] (pp.120–145). Lund: Studentlitteratur.
- Fenwick, T. (2015). Sociomateriality and learning: A critical approach. In Scott, D., & E. Hargreaves (Eds.), *The SAGE Handbook of Learning*, (pp. 83–93). DOI:10.4135/9781473915213.n8
- Frayling, C. (2008). *On craftsmanship*. London: Oberon Books Ltd.
- Frohagen, J. (2016). *Såga rakt och tillverka uttryck. En studie av hantverkskunnandet i slöjddämnet*. [Sawing straight and making expressions: A study of craft knowing in sloyd education]". Licentiate thesis, Stockholm University.
- Gandy, M. (1994). *Recycling and the politics of urban waste*. London: Earthscan Routledge.
- Garrison, J. (1994). Realism, Deweyan Pragmatism, and Educational Research. *Educational Researcher* 23(1), 5–14.
- Glažar, S. A., Vrtačnik, M., & Bačnik, A. (1998). Primary school children's understanding of municipal waste processing. *Environmental Education Research*, 4(3), 299–308.
- Gordon, J., & Patterson, J. (2013). Response to Tracy's under the big tent: Establishing universal criteria for evaluating qualitative research. *Qualitative Inquiry*, 19(9), 689–695.
- Guba E. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology Journal* 29(1), 75–91.

- Hajer, M. A. (1995). *The politics of environmental discourse: Ecological modernization and the policy process*. Oxford: Clarendon.
- Håkansson, M. (2016). *Politisk tendens, politiskt ögonblick och kreativitet. Studier av miljö- och hållbarhetsundervisning*. [Political tendency, political moments and creativity. Studies of environmental and sustainability education]. Doctoral thesis, Uppsala University.
- Hansson, P. (2014). *Text, place and mobility – Investigations of outdoor education. Ecocriticism and environmental meaning making*. Doctoral thesis, Uppsala University.
- Haraway, D. (2007). *When species meet*. Minneapolis: University of Minnesota Press.
- Haraway, D. (2015). Anthropocene, capitalocene, plantationocene, chthulucene: Making kin. *Environmental Humanities* 6(1): 159–165.
- Harman, G. (2009). *Towards speculative realism. Essays and lectures*. Winchester: Zero Books.
- Hasselskog, P. (2010). *Slöjdlärares förhållningssätt i undervisningen*. [Educational sloyd teachers' approaches to teaching]. Doctoral thesis, Gothenburg University.
- Hasslöf, H. (2015). *The educational challenge in 'education for sustainable development'. Qualification, social change and the political*. Doctoral thesis, Malmö högskola.
- Hinchliffe, S., Kearnes, M. B., Degen, M., & Whatmore, S. (2005). Urban wild things: A cosmopolitical experiment, *Environment and planning D: Society and Space*, 23(5), 643–658.
- Hofverberg, H., & Kronlid, D. O. (2017). Human-material relationships in environmental and sustainability education – An empirical study of a school embroidery project. *Environmental Education Research*, 24(7), 955–968.
- Hofverberg, H., & Maivorsdotter, N. (2017). Recycling, crafting and learning – An empirical analysis of how students learn with garments and textile refuse in a school remake project. *Environmental Education Research*, 24(6), 775–790.
- Hofverberg, H., Kronlid, D. O., & Östman, L. (2017). Crafting sustainability? An explorative study of craft in three countercultures as a learning path for the future. *Nordic Journal of Science and Technology Studies*, 5(2), 8–21.
- Ideland, M., & Malmberg, C. (2015). Governing 'eco-certified children' through pastoral power: Critical perspectives on education for sustainable development. *Environmental Education Research*, 21(2), 173–182.
- Illum, B. (2006). Learning in practice – Practical wisdom: The dialogue of the process. *Journal of Research in Teacher Education: Theme Slojd: Tradition in transition* 16(2–3), 106–127.
- Illum, B., & Johansson, M. (2009). Vad är tillräckligt mjukt? Kulturell socialisering och lärande i skolans slöjdpraktik. [What is soft enough? Cultural socialisation and learning in educational sloyd]. *FormAkademisk - Research Journal of Design and Design Education*, 2(1), 69–82.
- Ingold, T. (2000). *The Perception of the Environment – Essays on Livelihood, Dwelling and Skill*. London: Routledge Taylor and Francis Group.
- Ingold, T. (2011). *Being alive – Essays on movement, knowledge and description*. London: Routledge Taylor and Francis Group.
- Ingold, T. (2013). *Making – Anthropology, archaeology, art and architecture*. London: Routledge Taylor and Francis Group.
- Jackson Lears, T. J. (1981). *No place of grace. Antimodernism and the transformation of American culture, 1880–1920*. Chicago and London: The University of Chicago Press.

- Jacob, D. (2013). Crafting your way out of the recession? New craft entrepreneurs and the global economic downturns. *Cambridge Journal of Regions, Economy and Society* 6(1), 127–140.
- Jakobson, B., & Wickman, P. O. (2008). The roles of aesthetic experience in elementary school science. *Research in Science Education*, 38(1), 45–65.
- Jakobsson, B., Lundegård, I., & Wickman, (Eds.), (2014) *Lärande i handling. En pragmatisk didaktik. [Learning in action. A pragmatic didactic]*. Lund: Studentlitteratur
- Jeansson, Åsa. (2017). Vad, hur och varför i slöjddämnet. Textillärares uppfattningar om innehåll och undervisning i relation till kursplanen. [What, how and why in educational sloyd. Craft teacher's perception of content and teaching in relation to the syllabus]. Doctoral thesis, Umeå University.
- Jickling, B. (1992). Why I don't want my children educated for sustainable education. *Journal of Environmental Education* 23(4), 5 – 8.
- Johansson, M. (2002). *Slöjdpraktik i skolan: Hand, tanke, kommunikation och andra medierande redskap*. [Educational sloyd practice: Hand, thought, communication and other mediating tools]. Doctoral thesis, Gothenburg University.
- Johansson, M., & Lindberg, V. (2017). Att lära sig se trädraken – Om tvekan och fokusförskjutning på väg mot förändrat kunnande. [Learn to see the straight grain – About hesitation and shifting in learning]. *Techne Serien A*, 24(1), 1–16.
- Johnson, E., & Morehouse, H. (Eds.). (2014). After the Anthropocene: Politics and geographic inquiry for a new epoch. *Progress in Human Geography*, 38(3), 439–456.
- Jordan, B., & Henderson, A. (1995). Interaction analysis: Foundations and practice. *The Journal of the learning sciences*, 4(1), 39–103.
- Jørgensen, N. J., Madsen, K. D., & Læssøe, J. (2018). Waste in education: The potential of materiality and practice. *Environmental Education Research*, 24(6), 807–817.
- Klaar, S. (2013). *Naturorienterad utbildning i förskolan. Pragmatiska undersökningar av meningsskapandets individuella, sociala och kulturella dimensioner*. [Nature-oriented education in preschool: Pragmatic investigations of individual, social and cultural dimensions of meaning making]. Doctoral thesis, Örebro University.
- Koch, M. (2012). *'Jeg strikker, derfor er jeg!'* Læring og identitet i uformelle læringsrum. ['I knit, therefore I am!'] Learning and identity in informal learning spaces]. Doctoral thesis, Åbo University.
- Læssøe, J. (2010). Education for sustainable development, participation and socio-cultural change. *Environmental Education Research*, 16(1), 39–57.
- Latour, B. (1993). *We have never been modern*. Cambridge, MA: Harvard University Press.
- Latour, B. (2004). *Politics of nature: How to bring the science into democracy*. Translated by Catherine Porter. Cambridge, MA: Harvard University Press.
- Law, J. (2004). *After method: Mess in social science research*. Oxon: Routledge.
- Law, J., & Hassard, J. (1999). *Actor network theory and after*. Oxford: Blackwell Publishing.
- Lee, J. (2014). Genre-appropriate judgments of qualitative research. *Philosophy of the Social Sciences*, 44(3), 316–348.
- Lepistö J., & Lindfors, E. (2015). From gender-segregated subjects to multi-material craft: Craft student teachers' views on the future of the craft subject. *FormAkademisk - Research Journal of Design and Design Education*, 8:(2), 1–20.

- Lewis, E., Baudains, C., & Mansfield, C. (2009). The impact of AuSSI-WA at a primary school. *Australian Journal of Environmental Education* 25, 45–57.
- Lidar, M. (2010). *Erfarenhet och sociokulturella resurser: Analyser av elevers lärande i naturorienterande undervisning*. [Experience and sociocultural resources: Analysis of students' learning in science education]. Doctoral thesis, Uppsala University.
- Lincoln, Y. S. (1995). Emerging criteria for quality in qualitative and interpretive research. *Qualitative Inquiry*, 1(3), 275–289.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. London: Sage.
- Linell, P. (1994). *Transkription av tal och samtal: Teori och praktik*. [Transcript of speech and conversation: Theory and practice.] Linköping: Linköpings universitet, Tema Kommunikation.
- Lloro-Bidart, T. (2017). A feminist posthumanist political ecology of education for theorizing human-animal relations/relationships. *Environmental Education Research*, 23(1), 111–130.
- Lloyd, A., & Gray, T. (2014). Place-based outdoor learning and environmental sustainability within Australian primary schools. *Journal of Sustainability Education* 1 (Sep.): ISSN: 2151–7452.
- Luckman, S. (2015). *Craft and the creative economy*. London: Palgrave MacMillan.
- Lundegård, I. (2007). *Towards pluralism: Students in situated deliberations on sustainable development*. Doctoral thesis, Stockholm University.
- Lundegård, I., & Wickman, P.O. (2012). It takes two to tango: Studying how students constitute political subjects in discourses on sustainable development. *Environmental Education Research*, 18(2), 153–169.
- Lundqvist, E. (2009). *Undervisningssätt, lärande och socialisation. Analyser av lärares riktninggivare och elevers meningsskapande i NO-undervisning*. [Teaching manners, learning and socialization]. Doctoral thesis, Uppsala University.
- Lutnæs, E. (2015). Imagining the unknown. Responsible creativity for a better tomorrow. *FormAkademisk - Research Journal of Design and Design Education*, 8(1), 1–15.
- Lutnæs, E., & Fallingen, N. (2017). Bærekraftig utvikling gjennom skapende praksis - Utvikling av økoliteracy i et samlet kunst- og håndverksfag. [Sustainable development through making – developing eco-literacy in a combined art and craft subject]. *FormAkademisk - Research Journal of Design and Design Education*, 10(3), 1–19.
- Lynch, J., & Mannion, G. (2016). Enacting a place-responsive research methodology: walking interviews with educators. *Journal of Adventure Education and Outdoor Learning* 16(4), 330–346.
- Lysgaard, J. A., & Simovska, V. (2015). The significance of 'participation' as an educational ideal in education for sustainable development and health education in schools. *Environmental Education Research*, 22(5), 613–630.
- MacEachren, Z. (2000). Crafting as a practice of relating to the natural world. *Canadian Journal of Environmental Education*, 5(Spring), 186–199.
- Maivorsdotter, N. (2012). *Idrottsutövandets estetik. En narrativ studie av meningsskapande och lärande*. [Aesthetic experience in sport. A narrative exploration of meaning making and learning]. Doctoral thesis, Örebro University.
- Maivorsdotter, N., & Quennerstedt, M. (2012). The act of running: A practical epistemology analysis of aesthetic experience in sport. *Qualitative Research in Sport, Exercise and Health*, 4(3), 362–381.

- Maivorsdotter, N., & Wickman, P. O. (2011). Skating in a life context: Examining the significance of aesthetic experience in sport using practical epistemology analysis. *Sport, Education and Society* 16(5), 613–628.
- Malandrakis, G. N. (2008). Children's understandings related to hazardous household items and waste. *Environmental Education Research*, 14(5), 579–601.
- Malone, K. (2015). Posthumanist approaches to theorising children's human-nature relations. In Nairn, K., & P. Kraftl (Eds.), *Space, Place and Environment. Geographies of Children and Young People Series*, 3, (pp.1–22). London: Springer.
- Mannion, G. (2007). Going spatial, going relational: Why 'listening to children' and children's participation needs reframing. *Discourse: Studies in the Cultural Politics of Education*, 28(3), 405–420.
- Mannion G. (2018). Intergenerational education and learning: We are in a new place. In Skelton T., Punch S., & Vanderbeck R. (Eds.), *Families, Intergenerationality, and Peer Group Relations* (pp. 307–327). Singapore: Springer.
- Mannion, G., Fenwick, A., & Lynch, J. (2013). Place-responsive pedagogy: Learning from teachers' experiences of excursions in nature. *Environmental Education Research*, 19(6), 792–809.
- Martinez, S. L., & Stager, G. (2013). Invent to learn: Makers in the classroom. *The Education Digest*, 79(4), 11–15.
- McKenzie, M. (2008). The places of pedagogy: Or, what we can do with culture through intersubjective experiences. *Environmental Education Research*, 14(3), 361–373.
- McKenzie, M., Hart, P., Bai, H., & Jickling, B. (Eds.). (2009). *Fields of green: Restorying culture, environment and education*. Cresskill, NJ: Hampton Press.
- McKenzie, M., & Bieler, A. (2016). *Critical education and sociomaterial practice: Narration, place, and the social*. New York: Peter Lang Publishing.
- Morton, T. (2013). *Hyperobjects. Philosophy and ecology after the end of the world*. Minneapolis: University of Minnesota Press.
- Odegard, N. (2012). When matter comes to matter – Working pedagogically with junk materials. *Education Inquiry*, 3(3), 387–400.
- Öhman, J. (2006). Den etiska tendensen i utbildning för hållbar utveckling. Meningsskapande i ett genomlevandeperspektiv. [The ethical tendency in education for sustainable development. A practical understanding of meaning-making]. Doctoral thesis, Örebro University
- Öhman, J. (2008). Environmental ethics and democracy responsibility- A pluralistic approach. In Öhman, J. (Ed.), *Values and Democracy in Education for Sustainable Development – Contributions from Swedish Research* (pp.17–32). Liber: Malmö.
- Öhman, J., & Öhman, M. (2013). Participatory approach in practice: An analysis of student discussions about climate change. *Environmental Education Research*, 19(3), 324–341.
- Öhman, J., & Östman, L. (2007). Continuity and change in moral meaning-making - A transactional approach. *Journal of Moral Education*, 36(2), 151–168.
- Orton-Johnson, K. (2014). DIY citizenship, critical making and community. In M. Ratto, & M. Boler (Eds.), *DIY Citizenship: Critical Making and Social Media* (pp. 141-156). Cambridge, MA: MIT Press.
- Östman, L. (1995). *Socialisation och mening. No-utbildning som politisk och miljömoraliskt problem*. [Meaning and socialization. Science education as a political and environmental-ethical problem]. Doctoral thesis, Uppsala University.

- Östman, L. (Ed.). (2003). *Nationell och internationell miljödidaktisk forskning: En forskningsöversikt*. [National and international research of environmental education: A research review]. Uppsala: Universitetsstryckeriet.
- Östman, L. (2010). Education for sustainable development and normativity: A transactional analysis of moral meaning – Making and companion meanings in classroom communication. *Environmental Education Research* 16(1), 75–93.
- Östman, L. (Ed.). (2015). *Naturmöten och miljömoraliskt meningsskapande*. [Nature encounters and moral environmental meaning making]. Uppsala: Acta Universitatis Upsaliensis.
- Payne, P. G. (2016). What next? Post-critical materialisms in environmental education. *The Journal of Environmental Education*, 47(2), 169–178.
- Pye, D. (1968/2010). The nature and art of workmanship. In Adamsson, G. (Ed.). *The Craft Reader* (pp. 341–353). Oxford: Berg.
- Pyry, N. (2017). Thinking with broken glass: Making pedagogical spaces of enchantment in the city. *Environmental Education Research*, 23(10), 1391–1401.
- Quennerstedt, M. (2006). *Att lära sig hälsa*. [Learning health]. Doctoral thesis, Örebro University.
- Rautio, P. (2013). Being nature: Interspecies articulation as a species - Specific practice of relating to environment. *Environmental Education Research*, 19(4), 445–457.
- Rautio, P., Hohti, R., Leinonen, R.-M., & Tammi, T. (2017). Reconfiguring urban environmental education with ‘shitgull’ and a ‘shop’. *Environmental Education Research*, 23(10), 1379–1390.
- Rioux, L., & Pasquier, D. (2013). A longitudinal study of the impact of an environmental action. *Environmental Education Research*, 19(5), 694–707.
- Robson, S. (2009). Producing and using video data in the early years: Ethical questions and practical consequences in research with young children. *Children & Society*, 25(3), 179–189.
- Rönkkö, M.-L., & Lepistö, J. (2016). The craft process developing student decision making. *Techné Series A*, 23(1), 48–61.
- Ross, H., & Mannion, G. (2012). Curriculum making as the enactment of dwelling in places. *Studies in Philosophy and Education*, 31(3), 303–313.
- Rudsberg, K. (2014). *Elevers lärande i argumentativa diskussioner om hållbar utveckling*. [Students’ learning in argumentative discussions about sustainable development]. Doctoral thesis, Uppsala University.
- Russell C. L. (2005). ‘Whoever does not write is written’: The role of ‘nature’ in post-post approaches to environmental education research. *Environmental Education Research*, 11(4), 433–443.
- Russell, C., & Fawcett, L. (2013). Moving margins in environmental education. In R. Stevenson, M. Broady, J. Dillon, & A. Wals (Eds.), *International handbook of research on environmental education* (pp. 365–374). New York: Routledge.
- Russell, C., Gough, A., & Whitehouse, H. (2018). Introduction: Gender and environmental education in the time of #MeToo. *Journal of Environmental Education*, 49(4), 273–275.
- Säfström, C.-A., & Östman, L., (Eds.). (1999). *Textanalys*. [Text analysis]. Lund: Studentlitteratur.
- Scott, W., & Gough, S. (2003). *Sustainable development and learning: Framing the issues*. London: Routledge Falmer.
- Sennett, R. (2008). *The craftsman*. Penguin Books: London.

- Shava, S. (2013). The representation of indigenous knowledges. In Stevenson, R. B., Broady, M., Dillon, J., & Wals, A. E. J. (Eds.), *International handbook of research on environmental education* (pp. 384–393). New York: The American Educational Research Association by Routledge Publisher.
- Shava, S., Krasny, M., Tidball, E., Keith, G., & Zazu, C. (2010). Agricultural knowledge in urban and resettled communities: Applications to social–ecological resilience and environmental education. *Environmental Education Research, 16*(5–6), 575–589.
- Shilling, C. (2016). *The body – A very short introduction*. Oxford: Oxford University Press.
- Sigurdsson, E. (2014). *Det sitter i väggarna: En studie av trä- och metallslöjdens materialitet, maskulinitet och förkroppsliganden*. [It's in the walls: On the materiality, masculinity and embodiment of wood and metal sloyd]. Doctoral thesis, Umeå University.
- Snaza, N., & Weaver, J. (Eds.). (2015). *Posthuman research and education*. New York: Routledge
- Somerville, M. (2016). Environmental and sustainability education: A fragile history of the present. In Hayward D. W. L. and Pandya, J. (Eds.), *The Sage Handbook of Curriculum, Pedagogy and Assessment*, (pp. 506–522). London: SAGE.
- Sørensen, E. (2009). *The materiality of learning – Technology and knowledge in educational practice*. Cambridge: Cambridge University Press.
- Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., & Ludwig, C. (2015). The trajectory of the Anthropocene: The great acceleration. *The Anthropocene Review, 2*(1), 81–98.
- Stevenson, R. B., Broady, M., Dillon, J., & Wals, A. E. J. (2013). *International handbook of research on environmental education*. New York: The American Educational Research Association by Routledge Publisher.
- Swedish National Agency for Education. (SNAE 2011a). *Kommentarmaterial till kursplanen i slöjd*. [Commentary to the curriculum of educational sloyd]. Stockholm: Ordförrådet AB.
- Swedish National Agency for Education. (SNAE 2011b). *Curriculum for the compulsory school, preschool class and the recreation centre 2011*. Stockholm: Ordförrådet AB.
- Swedish Research Council. (2017). *Good Research Practice*. Stockholm. Retrieved from: https://www.vr.se/download/18.5639980c162791bbfe697882/1529480529472/Good-Research-Practice_VR_2017.pdf
- Takano, T., Higgins, P., & McLaughlin, P. (2009). Connecting with place: Implications of integrating cultural values into the school curriculum in Alaska. *Environmental Education Research, 15*(3), 343–370.
- Taylor, A. (2017). Beyond stewardship: Common world pedagogies for the Anthropocene. *Environmental Education Research, 23*(10), 1448–1461.
- Taylor, C. (2016). Edu-crafting a Cacophonous Ecology: Posthumanist Research Practices for Education. In Taylor, C. A., & Hughes, C. (Eds.), *Posthuman Research Practices in Education* (pp. 5–24). London: Palgrave Macmillan.
- Tracy, S. (2010). Qualitative quality: Eight big tent criteria for excellent qualitative research. *Qualitative Inquiry, 16*(10), 837–851.
- UNCED. (1992). *Agenda 21: Action plan for the next century United Nations conference on environment and development*. Rio De Janeiro: United Nations. Retrieved from: <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>.
- UNESCO. (1987). *Our common future*. Oxford: Oxford University Press.

- UNESCO. (2015). Education 2030: Incheon declaration and framework for action for the implementation of sustainable development goal 4 – ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Retrieved from http://uis.unesco.org/sites/default/files/documents/education-2030-incheon-framework-for-action-implementation-of-sdg4-2016-en_2.pdf.
- Van Poeck, K., & Lysgaard, J. A. (2016). The roots and routes of environmental and sustainability education policy research. *Environmental Education Research*, 22(3), 305–318.
- Veeber, E., Syrjäläinen E., & Lind, E. (2015). A discussion of the necessity of craft education in the 21st century. *Techné Series A*, 22(1), 15–29.
- Walby, K., & Luscombe, A. (2017). Criteria for quality in qualitative research and use of freedom of information requests in the social sciences. *Qualitative Research*, 17(5), 537–553.
- Wals, A. E. J. (2010). Between knowing what is right and knowing that is it wrong to tell others what is right: On relativism, uncertainty and democracy in environmental and sustainability education. *Environmental Education Research* 16(1), 143–51.
- Westerlund, S. (2015). *Lust och olust: Elevers erfarenheter i textilsloyd*. [Pleasure and displeasure: Students' experiences in textile sloyd]. Doctoral thesis, Umeå University.
- Whittaker, D. J. (2014). *The impact and legacy of educational sloyd – Head and hands in hardness*. New York: Routledge.
- Wickman, P. O. (2006). *Aesthetic experience in science education: Learning and meaning-making as situated talk and action*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Wickman, P. O., & Östman, L. (2002). Learning as discourse change: A sociocultural mechanism. *Science Education*, 86(5), 601–623.
- Wittgenstein, L. (1953). *Philosophical investigations*. Oxford: Blackwell.
- von Busch, O. (2013). Collaborative craft capabilities: The bodyhood of shared skills. *The Journal of Modern Craft*, 6(2), 135–146.
- World Economic Forum. (2016). *The new plastics economy. Rethinking the future of plastics*. Retrieved from http://www3.weforum.org/docs/WEF_The_New_Plastics_Economy.pdf
- Yin, R. K. (2014). *Case study research: Design and methods*. 5th edition (1994, 2nd edition). Los Angeles: SAGE Publications, Inc.
- Zazu, C. (2011). Heritage – A conceptually evolving and dissonant phenomenon: Implications for heritage management and education practices in post-colonial Southern Africa. *Southern African Journal of Environmental Education*, 28, 135–143.

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