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Addressing Policy, Practice, and Research That Matters

SPECIAL ISSUE

Sustainable Development Goals and Early Childhood Environmental Education: Awareness, Understanding, and Transformation

Victoria Carr, Sue Elliott, and Eva Ärlemalm-Hagsér, Special Issue Editors

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SPECIAL ISSUE EDITORIAL NOTE

Rethinking Play in Nature:
Embracing Early Childhood Education for Sustainability

Victoria Carr, Special Issue Editor
Sue Elliott, Special Issue Editor
Eva Ärlemalm-Hagsér, Special Issue Editor

Outdoor play was the norm when the guest editors of this special issue were children in the United States of America, Australia, and Sweden. We explored our respective natural worlds and the flora and fauna within, expanding our realm as we aged. We were not always kind to nature, but we constructed understandings of our own ecosystems because we were intimately part of them. We developed an environmental morality of sorts, ones that led us to edit this special issue. Today, researchers and practitioners are compelled to advocate for children to play and, more specifically, play outdoors. In fact, in his landmark longitudinal study, Roger Hart (1979) found that in just one generation, children were forbidden from exploring the reaches of their own parents, their degrees of freedom curtailed by parents who now guide their children's creative play and monitor their movements and moments alone. Very young children who were allowed to play outdoors with observations by parents from the house windows, were not affording their own children the same opportunities. Like Rachel Carson (1956), he maintains that we need to offer children *time* in natural settings where they can dream and reflect, to get lost in their space, while recognizing that adults who appreciate nature themselves and demonstrate an ethic of care are well equipped to engage children with the natural world (Roger Hart, personal communication, November 16, 2021).

We are understanding more about the long-term impacts of formative nature experiences on pro-environmental attitudes and behaviors (see Barrable & Booth, 2020; Broom, 2017; Chawla, 2020; Cheng & Monroe, 2012; Frantz & Mayer, 2014; Martin & Czellar, 2017), important referents for establishing a sustainability mindset. However, as Elliott and Young (2015) have pointed out, being in and romancing nature is not enough to address pressing contemporary environmental issues. They argue for critically reflective and transformative approaches to shift the pervasive nature/human dichotomy and more deeply engage with education for sustainability. To rest on our shared nostalgia for nature is perilous when globally sustainable futures for all, human and more than human, are under threat. Since our own childhoods, play outdoors is not all that has been lost; nature is declining and species are becoming extinct at accelerating rates. Animal populations have decreased by 70% over the past 50 years (Almond, et al., 2020). The Earth's 10 warmest years on record have all occurred since 2005. Seven of the 10 have occurred just since

2014 and the "top ten window" shifts forward in time each year (NOAA, 2021). Clearly, the interconnected web of life is frayed. As those reading this journal know, action is necessary to ensure positive futures for the world's children. We must shift pedagogies toward educating for sustainability. More explicitly, sustainability is meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland & Mansour, 1987, p. 43), often encapsulated as intergenerational equity in early childhood education. Drawn from an environmental education focus on actions and issues, early childhood education for sustainability adopts a more ecocentric perspective; it promotes a frame of mind focused on understandings of human-nature relationships, its multicultural interpretations, and how we are all connected (Bonnett, 2002; Davis, 2005; Kopnina, 2014; Lang, 2007; Miller, 2014).

A focus on the Earth, to protect the planet through sustainable practices, is just one interconnected dimension of the United Nations (UN, 2015) global plan of action for people, planet, and prosperity in *Transforming our World: The 2030 Agenda for Sustainable Development*. Building on the eight ambitious Millennium Development Goals (UN, 2000) and other global initiatives, the 2030 Agenda encompasses 17 Sustainable Development Goals (SDGs) with numerous indicators of success that were adopted by all members of the United Nations in 2015 (UN, 2015). Arguably, should the goals be realized, the lives of all Earth's inhabitants would be profoundly and positively transformed. Alarmingly, however, is that, with a rise in nationalism and political divide, governments and their leaders are not committed to participating in a global community, even when the need for international cooperation to address climate change and worsening inequalities is urgent (Ghosh, 2019; Saxena, et al., 2021). Yet, although Saxena et al. (2021) outline challenges in conceptualization, implementation, and evaluation of the SDGs, they also call for a dialectical and strategic interdisciplinary approach for optimizing current efforts that address the SDGs. Explicitly, they emphasize that the way forward is to focus on transformative learning, morally courageous leadership, and robust partnerships. This philosophical orientation underscores the genesis of this special issue of the *International Journal of Early Childhood Environmental Education.*

To position ourselves as editors of this special issue, we embrace the SDGs as critical for humanity and the planet. We are committed to investigating their interconnectedness with meaningful and evocative early childhood experiences facilitated by sustainably oriented and environmentally conscious adults. We acknowledge the criticisms targeted to the challenges and controversies surrounding the SDGs, including inconsistencies, measurement difficulties, financial investments, and interpretations as global indicators, particularly SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (King, 2017; Swain, 2017). Yet, in our call for abstracts, we emphasized that early childhood environmental education is where the SDGs can be distilled into theoretical, transformational, and relational practices. We asserted that pathways that transform socio-environmental-economic systems begin early and, as the Earth is at a critical tipping point for loss of biodiversity and climate change, it is essential that progress toward these goals be accelerated. Considering that sustainability is about complex systems based on relationships, educating for sustainability is not an "add on" to curricula, but a way of viewing curriculum, pedagogy, policies, and organizations – essentially a paradigm change for how to teach young children (Jickling & Stirling, 2017).

The six articles in this special issue highlight the field's awareness of the SDGs, understanding of ways to address them in practice, and educators' transformation of pedagogy when critical, reflective, and intentional approaches to teaching as inquiry are employed. Methodologies used across the studies were primarily mixed methods employing surveys or content analyses with an emphasis on qualitative data such as observations, narrative inquiry, and case studies. The authors, international scholars and practitioners, conducted their research in Australia, the United Kingdom, Denmark, Canada, and Sweden, countries where cutting edge practices in early childhood education for sustainability have been recognized for many years. Sorely missing from the issue, however, are research studies from the United States. We can only speculate on why this is so, but hope this issue inspires transformative pedagogies and innovative research studies in and beyond the United States across culturally diverse programs and environments.

The first article in this special issue, *SDGs and Early Childhood Environmental Education: Awareness, Understanding, and Transformation*, attempts to demystify the daunting 169 associated and integrated targets within the SDGs. Lisa Sonter and Sharon Kemp raise awareness of potential connections between policy, pedagogy, and the SDGs by analyzing alignments between the SDGs and Australian Early Childhood Education and Care policies. They provide examples of practice and argue that cross mapping the SDGs with the Australian *National Quality Standard* (ACECQA, 2018) creates a framework for reflection and transformation of pedagogies that underlie pathways to change.

Also in Australia, Kim Beasy, Sherridan Emery, Di Nailon, and Diane Boyd (UK), describe an intergenerational community skill-sharing program that provides formal and informal learning opportunities in their article, *Skills 4 Kids Cafes: Working to Support SDG 4 Through Delivering Early Childhood Educator Professional Learning in Partnership with Community.* They describe an interactional space that builds communities of practice and promotes lifelong learning for both community members and educators; one that challenges epistemological assumptions about teaching and sustainability. Through a convergent mixed-methods research design, the researchers investigated participants' learning, specifically as it relates to SDG 4 Global Citizenship. They expound upon the complexity involved in documenting intangible phenomena that is inherent in multi-age relationship building, raising awareness of sustainability issues, and lifelong learning when there are numerous opportunities for ontological shifts.

Halfway around the world from the two aforementioned studies, Nicky Hirst and Catherine Wilkinson investigated pre-service early childhood education teachers' views on caring attitudes and empathy within natural environments, particularly with regard to the important role of text and illustrations in children's storybooks. Their article, *Student Authors, Children's Literature and Early Childhood Education for Sustainability: Findings from a Pedagogic Research Project,* reported their findings as they align with the SDGs, specifically learning about the natural environment (SDG 15 Life on Land), gender inequalities (SDG 5 Gender Equality), and equal rights and responsibilities (SDG 10 Reduced Inequalities). They discuss the emerging themes of their research related to constructions of children, pedagogical purpose and different ways of knowing and call for mindful shifts towards a more critical praxis with young children.

In the issue's fourth article, Inger Lerstrup, Louise Chawla, and Harry Heft remind us that forest preschools emerged in Denmark in the 1950s. They describe the results from three case studies in their article *Affordances of Small Animals for Young Children: A Path to Environmental Values of Care*, particularly as they relate to SDG 15 which calls for people to protect terrestrial ecosystems and prevent biodiversity loss. Inherent in their article is the quest undertaken by teachers for a deeper understanding of natural phenomena and the affordances offered within forest settings, particularly because interactions with small creatures may contribute to children's long-term dispositions to protect forests and biodiversity.

Across the Atlantic, Elizabeth Boileau, Ziad Dabaja, and Debra Harwood report findings from their analyses of a national survey of educators working in outdoor nature-based programs in *Canadian nature-based early childhood education and the UN 2030 Agenda for Sustainable Development: A Partial Alignment.* They explored how nature-based programs address several SDGs while promoting the development of key competencies for children's engagement with issues of sustainability. Their three-way juxtaposition of the SDGs, UNESCO Early Childhood Guidelines, and outdoor nature-based learning benefits as perceived by Canadian educators elicits transformative thoughts for understanding and reframing practice.

The final article in this special issue offers insight into pedagogies that are transformative for children and their teachers. Eva Ärlemalm-Hagsér and Ingrid Pramling Samuelsson's article, *"Business as usual"? Or transformative and transactive teaching leading towards the Agenda 2030 goals in Swedish Early Childhood Education*, reports on Swedish early childhood education's new national objectives relative to the SDGs. They describe and discuss case study narratives that highlight Swedish curriculum goals that are explicit about viewing children as active social agents with the right to participate in decision-making. Narratives from early childhood teachers offer insight into the conscientious planning and practices implemented by skillful teachers who demonstrate how an ethos of sustainability transacts pedagogy.

Developmental science affirms that resilience and hope are dynamic processes in the human psyche with research demonstrating how protective factors may occur naturally or through interventions (Luthar et al., 2000; Masten, 2014). Given the threats to humanity and the environment, it is important that adults mitigate effects from these threats while bolstering hope and encouraging environmental engagement (Burke et al., 2018), themes that run through the articles in this special issue. As active agents in their own learning, young children are capable of engaging with complex environmental and social issues (NSTA, 2014), clearly demonstrated in several of the issue's articles. We were impressed by the thoughtfulness embedded in the reporting and discussion of the authors' research and truly hope their articles inspire significant shifts in thinking, research, and practice for IJECEE readers.

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Connecting the UNESCO Sustainable Development Goals with Australian Early Childhood Education Policy to Transform Practice

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ABSTRACT

The Brundtland (1987) report challenged the perception that the environment was somehow separate from humans and the more recent *Sustainable Development Goals* (SDGs) (UNESCO, 2015) have emphasised the pressing need for sustainable development to meet the needs of current and future generations. As progress towards meeting the SDGs by 2030 was not advancing at the scale required globally (UNESCO, 2020), a 'Decade of Action' was declared in 2019 by the United Nations. Clearly, transformational approaches need to be integrated in all corners of education for the ripples to become the waves needed for global societal change. Strong curricula interventions mirroring a broader view of sustainability are evident in Norway, Sweden, New Zealand and emerging in Japan (Elliott, Ärlemalm-Hagsér & Davis, 2020). Additionally, the Australian school curriculum (ACARA, 2014) has an embedded cross-curricular priority of sustainability, but national early childhood education policies and curricula, including the recently revised Australian *National Quality Standard* (NQS) (ACECQA, 2018), are less explicit. To address challenges for educators, such as a lack of understanding about the multi-dimensionality of sustainability; the predominance of anthropocentric viewpoints; and, a lack of pedagogical guidance, in this paper we raise awareness of potential connections between policy, pedagogy, and the SDGs. Moreover, we explore connections between the 17 SDGs and the Australian NQS and early childhood education for sustainability (ECEfS) practices.

Keywords: Early Childhood Education for Sustainability (ECEfs), sustainability, transformative ECEC approaches, future-focused ECEC pedagogies, Sustainable Development Goals

Early childhood education and care (ECEC) has much to offer as a conduit for advancing sustainability. It makes a vital contribution to the interdependent pillars of social, economic, political and environmental development, as identified in the *Sustainable Development Goals* (SDG) (UNESCO, 2017). The SDGs recognise children as "agents of change when they channel their infinite potential to create a better world" (Britto, 2015, p. 1). Working with the world's youngest children is crucial to the connections required to implement early childhood education for sustainability (ECEfS) and to promote transformative change towards a society which respects the global needs of sustainability.

ECEfS is fundamentally about change. Holistic, action-oriented and participatory pedagogies and approaches, inherent in ECEfS, are critical to achieve the change required for a sustainable world (Davis, 2015). Transformation is also an imperative of the SDGs, they were developed to solve complex societal challenges. To raise awareness of potential connections between policy, pedagogy and the SDGs, we offer insights into how the SDGs and the *National Quality Standard* (NQS) (Australian Children's Education and Care Quality Authority (ACECQA), 2018) can be mapped together to promote awareness and understanding of sustainability, inspire and strengthen everyday practice, and promote future-orientated improvement and social awareness.

Importantly, we do not advocate using the SDGs to 'tick off' sustainable practices or create a recipe or 'how to' guide to implement sustainable activities. Rather, we offer an opportunity to build an understanding of the emultidimensionality of sustainability and transformational approaches to encourage further reflection and future-focused advocacy and action for ECEfS.

Methodological Approach

Anecdotally, when facilitating professional learning in Australian early childhood services, we have often found educators unfamiliar with the SDGs and the multidimensionality of sustainability as identified by UNESCO (2010). These professional findings mirror both Australian and international research (Elliott et al., 2016; Inoue et al, 2016). While the SDGs are not a didactical tool, we were interested in exploring the potential use of the SDGs to increase awareness and understanding of sustainability as a multidimensional concern. We propose engaging with the SDGs might afford opportunities for educators to both demonstrate quality practice aligned with the NQS, as well as support transformative and collective pedagogical approaches to foster and further change.

We began by exploring sustainability, the SDGs and considered implications for ECEfS. We scrutinized literature exploring ECEfS in ECEC policy internationally, and then turned to Australian policy, in particular, the revised *National Quality Standard* (ACECQA, 2018). We analysed the NQS to investigate how sustainability is positioned explicitly and implicitly, and then identified ramifications for educators. We examined the SDGs to map alignments between the NQS and the SDGs to reveal connections. Finally, we interrogated examples of Australian ECEC practices to illustrate how the SDGs may be integrated with the NQS to inspire future-orientated transformational ECEfS practice. Note the NQS employs the term 'educators' to refer to all adults who work with children, regardless of qualifications, so this terminology is used throughout our paper.

Sustainability and sustainable development

More than 30 years ago, *Our Common Future*, Brundtland's (1987) report for the United Nations, called for a global agenda for change to ensure a more sustainable future. This report appealed for global, intergenerational equity, challenging the perception that the environment was somehow separate from humans, and the view of development as being a concern for poorer nations only. To achieve a more sustainable world, global, transformational progress across social, economic, ecological, and political dimensions was required.

Decades later, sustainable development encompasses many processes and pathways to achieve sustainability (UNESCO, 2019). Sustainability, or a more sustainable world, is the long-term goal. Sustainable development focusses on inter- and intragenerational equity bound to the distinct but interconnected pillars of the environment, economy, and society (Mensah, 2019). The UNESCO (2010, cited in Davis, 2015) depiction of sustainable development, as illustrated in Figure 1, distinguishes the political and social aspects of society further, identifying four interrelated dimensions: social, economic, natural, and political. Based on the original findings from Brundtland's (1987) report, it represents a broad, complex, and interconnected approach which aims to shift focus from the perception of sustainability as a singularly environmental concern.

Background to the SDGs

The arrival of a new century provided impetus for specific goals to meet the challenge of globalisation and poverty. Global evidence of geological, atmospheric, biospheric, and hydrologic alterations to the Earth as a direct impact of the ever-growing human population became widely known (The Smithsonian, 2020). The *Millennium Development Goals* set by the UN in 2000 focused on reducing poverty and corresponding dilemmas such as water access, disease control, and access to education. The 2007 declaration of the ecological epoch, the Anthropocene (Steffen et al., 2007), identified the impacts of humans upon the earth, including climate change, deforestation and reduced biodiversity, and created more momentum for change. The Millennium goals were expanded and replaced by the *Sustainable Development Goals* (SDGs) (UNESCO, 2015), shown in Table 1, to meet the urgency of challenges (environmental, political and economic) facing the world (UNESCO, 2019).
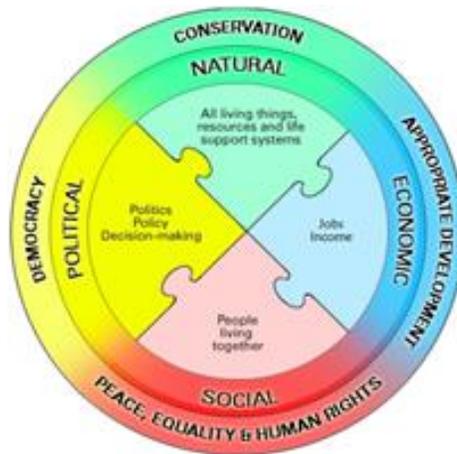
Figure 1. *The Four Dimensions of Sustainable Development (UNESCO, 2010)*

Table 1
Sustainable Development Goals

Sustainable Development Goals	
1	No Poverty – End poverty in all its forms everywhere
2	Zero Hunger – End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3	Good Health and Well-Being – Ensure healthy lives and promote well-being for all at all ages
4	Quality Education – Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5	Gender Equality – Achieve gender equality and empower all women and girls
6	Clean Water and Sanitation – Ensure availability and sustainable management of water and sanitation for all
7	Affordable and Clean Energy – Ensure access to affordable, reliable, sustainable and clean energy for all
8	Decent Work and Economic Growth – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9	Industry, Innovation and Infrastructure – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10	Reduced Inequalities – Reduce inequality within and among countries
11	Sustainable Cities and Communities – Make cities and human settlements inclusive, safe, resilient and sustainable
12	Responsible Consumption and Production – Ensure sustainable consumption and production patterns
13	Climate Action – Take urgent action to combat climate change and its impacts
14	Life below Water – Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15	Life on Land – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16	Peace, Justice and Strong Institutions – Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17	Partnerships for the Goals – Strengthen the means of implementation and revitalize the global partnership for sustainable development

Note: Adapted from *Sustainable Development Goals* UNESCO (2015)
https://en.unesco.org/sustainabledevelopmentgoals

The 17 SDGs define the focus for work towards future sustainability from 2016 to 2030. They aim to "secure a sustainable, peaceful, prosperous and equitable life on earth for everyone now and in the future" (UNESCO, 2017, p. 6). The goals reflect the global complexity of sustainable development across four intertwined dimensions (environmental, economic, social, and political) (UNESCO, 2010). This complexity is also demonstrated in the interconnection and interrelatedness of all the SDGs. Action in each goal impacts another. However, progress on the SDGs is not advancing at the scale required. In September 2019, UNESCO called for a Decade of Action to accelerate global progress on the goals. The COVID-19 pandemic has thwarted progress further (UNESCO, 2020). Initially a health crisis, this pandemic has become a political, social and economic crunch which is stalling progress on environmental change. We argue to achieve the goals by 2030 urgent transformational approaches are required.

Understandings of Education for Sustainability in Early Childhood Practice

Education has long been a key driver for change. Quality education is a goal itself (SDG 4) and critical to the success of all 17 goals. Education is acknowledged as integral to sustainable development across all dimensions as well as a key enabler in SDG 4.7:

> By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development. (UNESCO, 2017, p. 7)

Moreover, education for sustainability (EfS) is understood as a fundamental part of a quality education. UNESCO (2017) insists that EfS must be integrated into policy frameworks, programs and curricula at all levels of governance and all levels of formal and informal education including ECEC.

EfS, and, specifically for the context of this paper, ECEfS, is a socially transformative approach across all four dimensions of sustainability (Davis, 2015). Learning is holistic and centred on principles such as: intergenerational equity; relationships and interconnections; action orientated processes; systemic, whole settings approaches; critical thinking and reflection; empowerment; active citizenship; democratic participation and decision-making (Davis, 2015; Elliott et al., 2016). ECEfS and ECEC draw on foundational principles of social justice and equity (Davis, 2015; Elliott et al., 2016). However, many Australian educators do not identify principles such as social justice and equity as aspects of sustainability (Elliott et al., 2016; Hill et al., 2014). As Elliott et al. (2016) state "Deeper understandings of the multiple dimensions of sustainability, consideration of sustainability values and commitment to relevant ethics and systems approaches to daily sustainable living all still appear to be quite limited" (p. 24).

Research suggests that ECE educators predominantly focus on nature-based activities and actions such as playing in nature, tending worm farms, recycling or composting (Elliott & Young, 2015; Inoue et al., 2016). This nature by default paradigm stems from legacies of romantic traditional theorists such as Rousseau and Frobel and more recent advocates such as Sobel and Louv (Elliott & Young, 2015). These theories inextricably link children's wellbeing and development with nature, and a love of nature as crucial to ECEfS (Elliott, Ärlemalm-Hagsér et al., 2020; Elliott & Young, 2015). As a result, educators often perceive that having a 'nature' orientation to their work is enough, and that this is equivalent to 'doing' ECEfS (Elliott et al., 2016; Elliott & Davis, 2017; Inoue et al., 2019). These perceptions are untenable in the Anthropocene (Elliott & Davis, 2017; Inoue et al., 2019). They do not reflect a multidimensional or transformational view of EfS.

Education for Sustainability in International ECEC Policy

Elliott et al. (2016, p. 28) emphasise the need for Australian early childhood educators to recognise principle and practice connections and embed these through everyday policies and pedagogies that reflect deeper understandings of sustainability. We note, strong curricula and policy interventions mirroring a broader view of sustainability are

evident internationally. While a detailed examination is beyond the scope of this paper, we offer a brief summary of recent interventions in Norway, Sweden, New Zealand and Japan with potential to inform policy change in Australia.

Norway is recognised for its long history of education for sustainable development (Heggen, 2016). More recently, the revised *Norwegian Framework Plan for ECE* (Norwegian Ministry of Education and Research, 2017) officially mandated sustainable development as one of the core values for early childhood. Reflecting the Brundtland (1987) report, sustainable development is seen as multi-dimensional (social, environmental and economic). The revised framework pays close attention to intergenerational equities, democracy, diversity, and social justice (Elliott et al., 2020; Li et al., 2019).

Recent policy revisions in Sweden build on a long history of ECEC educators working with children as active contributors across environmental, political, social and economic sustainability issues (Ärlemalm-Hagsér, 2013, cited in Elliott et al., 2020). The 2018 revised curriculum recognises sustainable development as a fundamental value. Three new curriculum goals aligned with sustainability have been introduced, which emphasise children as important actors for creating change towards sustainable futures (Elliott et al., 2020). This recognition aligns with the incorporation of the *United Nations Convention on the Rights of a Child* (UNICEF, 1989) into Swedish Law from January 2020.

In New Zealand, the Education Council's *Our Code, Our Standards* commits that all teachers will promote and protect the principles of human rights, sustainability and social justice and foster learners to be active participants in community life and engaged in issues important to the wellbeing of society (New Zealand Education Council, 2017). This professional responsibility is expected at both pre-service and in-service levels. Social dimensions of sustainability and active, democratic citizenship also lie at the heart of the revised early childhood curriculum *Te Whāriki* (New Zealand Ministry of Education, 2017).

Japanese early childhood educators have a strong tradition of practising nature-based activities in early childhood services. Inoue et al. (2019) note that further research on Japanese Forest kindergartens and Japanese interpretations of Swedish Skogsmulle forest programs could offer potential for promoting ECEfS in Japan. Japan's revision of its national kindergarten curriculum in 2017 included the phrase "to build a sustainable society" (Japanese Ministry of Education, Culture, Sports, Science and Technology, 2017, p. 2, cited in Elliott et al. 2020, p. 58), offering scope for broader capacity building in ECEfS.

Education for Sustainability in Australian ECEC Policy

Both *The Australian Curriculum* (Australian Curriculum, Assessment and Reporting Authority (ACARA), 2014) and the early childhood *National Quality Framework* were developed in response to the Melbourne Declaration on Educational Goals for Young Australians (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008). Firstly, *The Australian Curriculum* (ACARA, 2014) is designed for school students aged between five years and eighteen years old and places emphasis on sustainability as an embedded cross-curricular priority. The policy recognises sustainability as multi-dimensional, requiring "consideration of environmental, social, cultural and economic systems and their interdependence" (ACARA, 2014, para.2). Building student capacity to participate critically and think creatively about issues concerning intergenerational equity and fairness is a key concept within this priority. In contrast, the *National Quality Framework* drives quality improvement for ECEC services including after school care across Australia and incorporates both the EYLF (DEEWR, 2009) as a curriculum guide and the NQS (ACECQA, 2017) an assurance rating and assessment component. While *The Australian Curriculum* (ACARA, 2014) offers a strong precedent here, we now specifically consider the somewhat tenuous location of sustainability in the NQS.

The National Quality Standard
Introduced in 2012 and revised in 2017, the NQS is underpinned by the Education and Care Services National Law and National Regulations and is linked to two national learning frameworks: *Belonging, Being and Becoming: The early years learning framework for Australia* (Department of Education and Training (Department of Education Employment and Workplace Relations (DEEWR), 2009) and *My time, Our place: Framework for school age care in*

Australia (DEEWR, 2009). Services are assessed and rated by the regulatory authority in their state or territory against seven quality areas within the NQS, as shown in Table 2. When initially introduced in 2012, the quality areas were divided into 18 standards, broken down into 58 elements. However, the revised NQS introduced in 2018 was consolidated to 15 standards and 40 elements. Key to this assessment process is the Quality Improvement Plan (QIP), a working document which each centre develops to identify continuous improvement across each of the seven quality areas. An overall rating is determined, and centres are graded as: Significant improvement required; Working toward the NQS; Meeting the NQS; or, Exceeding the NQS. Exceeding the NQS "requires a service to go above and beyond what is expected" (ACECQA, 2018, p. 92). Services awarded an Exceeding NQS rating may then apply to ACECQA for further assessment to be considered for a rating of Excellent. Services must display their ratings which are also published on a national register.

Table 2
Quality Areas within the revised National Quality Standard (2018)

Quality Area	Descriptor
Quality Area 1	Educational program and practice
Quality Area 2	Children's health and safety
Quality Area 3	Physical environment
Quality Area 4	Staffing arrangements
Quality Area 5	Relationships with children
Quality Area 6	Collaborative partnerships with families and communities
Quality Area 7	Governance and Leadership

Note: Adapted from National Quality Standard ACECQA (2018)
https://www.acecqa.gov.au/sites/default/files/2018-10/Guide-to-the-NQF-3-Assessment-and-rating.pdf

It is noteworthy sustainability was included in the original 2012 NQS under Quality Area 3 (Physical environment) Standard 3.3 and respective elements 3.3.1 and 3.3.2 elements. Standard 3.3 stated: "The service takes an active role in caring for its environment and contributes to a sustainable future" (ACECQA, 2017a). Element 3.3.1: "sustainable practices are embedded in service operations'' and Element 3.3.2: "children are supported to become environmentally responsible and show respect for the environment" sat within this original standard (ACECQA, 2017a). The contextualising of sustainability as an environmental concern was clearly visible. The remaining quality area foci clearly aligned to the principles of ECEfS identified earlier in this paper such as relationships and interconnections; action orientated processes; systemic, whole settings approaches; critical thinking and reflection; active citizenship; democratic participation and decision-making (Davis, 2015, Elliott et al., 2016); however, this connection was not explicit. The inclusion of sustainability within the national quality agenda, albeit a narrow focus, was considered a "first significant step towards systemic change in early childhood education" (Elliott & Davis, 2017, p. 171). Yet, this opportunity was short-lived. Research revealed educators found translating knowledge and beliefs about sustainability into pedagogical practice very challenging, and they often required professional support (Elliott & McCrea, 2015), with calls for urgent action to "demystify sustainability" (Elliott & McCrea, 2015, p. 17). A lack of explicit language in the NQS to guide educator engagement with sustainable practices was evident.

Sustainability and the Revised National Quality Standard

The NQS was reviewed during 2014 - 2015. Education Services Australia (2017) noted that more than half the submissions in response to the draft revision of the NQS requested the removal of the word 'sustainability' from the

document, echoing concern that these elements were too difficult to implement and unnecessarily burdensome (Productivity Commission, 2014). Such concern reflects Elliott and McCrea's (2015) findings.

The revised *National Quality Standard* (ACECQA, 2018) was released in 2018 to strengthen clarity, reduce regulatory burden and remove overlap between some elements (ACECQA, 2017). Significantly, there was no reference to sustainability in any Quality Areas. The term sustainability had been diluted to environmental responsibility within one element only, Element 3.2.3 of Quality Area 3 (Physical environment): "The service cares for the environment and supports children to become environmentally responsible" (ACECQA, 2018, p. 90). This explicit focus on children's engagement with and care for the natural environment did not reflect or explicitly address the complexity of sustainability as a multidimensional issue, in particular, the economic, social, and political dimensions (UNESCO, 2010). Thus, concerns arise about romanticised nature-by-default traditions in early childhood education and narrow anthropocentric interpretations of ECEfS (see Elliott, Ärlemalm-Hagsér et al., 2020; Elliott & Davis, 2017; Elliott & Young, 2015; Inoue et al., 2019).

The word 'sustainability' in the revised NQS is couched only within terms of practices: children "engage in sustainable practices … (and) watch adults model sustainable practices" (ACECQA, 2018, p. 198). However, the notion of embedding these practices has been removed from Meeting the NQS requirements and now sits within the descriptors for Exceeding the NQS, signaling that consistent and frequent sustainable practices are above and beyond everyday practice, and extra work for educators. Additionally, the inclusion of children's voices (and families' voices) as participants in the service's approach to environmental sustainability, and collaborating with families and/or the community in sustainable practices are also considered to be exceeding the standard. Should exceeding practices be considered as additional work for educators, this may potentially constrain children's participation in decisions that influence their world, as well as limiting partnerships with families. This is at odds with three guiding principles of the NQF: "the rights and best interests of the child are paramount; children are successful, competent and capable learners; and, the role of parents and families is respected and supported (ACECQA, 2018, pp. 10-11). Problematically, the inclusion of these descriptors as exceeding what is required for quality practice presents a confusing message for educators. They may view these practices as superfluous to the work required in everyday practice and not understand the links between participation and partnerships and the socio-political dimensions of sustainability.

International research calls for educators to "expand their repertoire of practices for sustainability towards more transformative approaches to EfS that encourage participation, problem-solving, critical thinking and 'making a difference'" (Inoue et al., 2016, p. 4). While the revised Australian Standard is purported to "strengthen quality through greater clarity" (ACECQA, 2017, p. 1), the watering down of the term sustainability has "eroded the feasibility for policy-leveraged practitioner change" (Elliott et al., 2020 p. 54) and potentially again marginalised sustainability (Elliott & Davis, 2017) from mainstream early childhood practice. It is evident that the revised NQS does not explicitly or effectively support educators to understand sustainability and ECEfs as a complex issue which requires transformational thinking and participatory, collective action. We argue the revised NQS has not demystified sustainability to inform practice.

Transforming Sustainability Practice

Transforming practice in ECEfS begins with an awareness that socio-political-environmental-economic dimensions are integrated and will move us towards a more cohesive and globally sustainable community when they are also taught and experienced together. However, pedagogies in ECEfS have been restricted to the limited understandings of educators with orientation towards traditional nature education, which are further challenged by the insufficiencies of the NQS to provide practice and pedagogical support (Inoue et al., 2016).

Historically, ECEC and ECEfS align (Davis, 2015; Samuelsson & Katz, 2008). Examples of this synergy include integrated curriculum; holistic viewpoints; a sense of community; participation; relationships; rights; and, social justice. Educators use critical and participatory pedagogies to enable children to make meaning of the world around them, challenge their thinking, and engage them as agentic and active citizens (Davis, 2015; Elliott, 2019; Samuelsson & Katz, 2008). These ECEC tenets are familiar and evident throughout the NQS. The NQS reflects the *United Nations*

Convention on the Rights of a Child (UNICEF, 1989) and positions children as rights holders, agentic citizens, and active decision-makers, reflected in Quality Area 1.2.3 (ACECQA, 2018). Further, the leading Australian ECEfS researcher Davis (2014) challenges educators to consider a revisioning of rights in ECEfS to transform their thinking and practice. Drawing on the *United Nations Convention on the Rights of a Child* (UNICEF, 1989), Davis (2014, p. 23) has developed a framework of five expanding rights: individual rights of a child; children's agentic participation rights; collective rights; intergenerational rights; and, bio/ecocentric rights. This expanded view guides educators towards an ecocentric viewpoint rather than an anthropocentric, child-centred view. It reinforces that humans and more-than-humans share the planet and live in a commonworld. When educators listen to children's ideas, look for opportunities for children to actively participate with and connect to the environment and community around them, and provide them with frameworks to influence and make a difference in the commonworlds they share with others, they are teaching for now and the future.

Furthermore, sustainable development is built on the principle of participation (Mensah, 2019). ECEfS must be participatory and collective to be successful and create sustainable change. Collaborative learning (NQS Quality Area 5.2.1) and collaborative partnerships with families and communities (NQS Quality Area 6) offer meaningful ways to embed and support the collaborative skills children and families can take forward in their collective projects and civic actions for sustainable development. But, again Australian educators require support to recognise these links between the NQS (ACECQA, 2018) and sustainability in practice.

Transformative pedagogies and approaches are also critical to achieve the change required for a sustainable world. The SDGs are transformative and orientate us towards hope for future generations by addressing all four dimensions of sustainability. Educators can broaden their understanding of the complexity of sustainability by becoming familiar with the SDGs. Furthermore, policy can be used as an effective methodology for working with SDGs (Paoli & Addeo, 2019). Clear alignments can be seen between the SDGs and Australian ECEC policy, specifically the NQS. Mapping the SDGs with the NQS offers an effective framework for educators to critically reflect and transform their practices and pedagogies to create waves of change. We explore some possible alignments between the SDGs and the NQS Quality Areas in Table 3, and in the following stories of ECEfS practice.

Stories of ECEfS Practice

Australian early childhood educators are continuously reflecting on their practice, children's learning and opportunities for improvement (NQS 1.3.2) to provide the highest quality education (SDG 4). Exploring the SDGs explicitly within local contexts through participatory projects can enable the practices of building community, collaboration and critical reflection as evidenced in the NQS (ACECQA, 2018). To illustrate this, we offer two stories of practice from Australian ECEC services. We describe how educators link their existing practice with the NQS and SDGs in their transformative journey to illustrate the potential of our mapping in Table 3.

The Book Swap
One centre recently participated in a 'Book Swap' for the Indigenous Literacy Foundation to promote National Book Week, providing an experience in community engagement (NQS 6.2.3) with the national community. Rather than the usual practice of children dressing up as a favourite story character, families were invited to bring in their unwanted books as a gift to others. The books were collected then displayed for swapping a week later, thus providing opportunity for equal access and participation (NQS 6.2.2) to a wider range of literature for families within the kindergarten. The final aspect of the book swap was for families to make a coin donation, which was then donated to the Indigenous Literacy Foundation to further fund resources for vulnerable Indigenous communities and reduce the gap in educational outcomes for these children. This action links to enacting and integrating SDG 10: Reduced inequalities and SDG 4: Quality Education in meaningful ways.

The educational practice of working together respectfully and democratically with children and families towards the Indigenous Literacy Foundation Book Swap also raised awareness of equity, see Table 4. This initiative provoked questions and conversations with children, families and colleagues about reduced inequalities (SDG10) and encouraged collaborative learning (NQS 5.2.1) both within the learning program and with families. The project also showed families the benefits of swapping items, building their awareness of a circular economy (SDG 11: Sustainable

communities). In addition, social interactions flourished as children and families shared book reviews and recommendations with each other over the swapping table and baskets (NQS 6: Collaborative partnerships with families and communities).

Table 3
National Quality Standard mapped with Sustainable Development Goals

National Quality Standard (2018)	Sustainable Development Goals
1. Educational Program and Practice 1.1 Program: Approved learning framework, Child centred, Program learning opportunities 1.2 Practice: Intentional teaching, responsive teaching & scaffolding and child directed learning 1.3 Assessment & planning: assessment and planning cycle, critical reflection, information for families	1 No Poverty 3 Good Health and Wellbeing 4 Quality Education 5 Gender Equality 10 Reduced Inequalities 14 Life under water. Content and conservation 15 Life on land. Content and conservation 17 Partnerships for the Goals
2. Children's Health and Safety 2.1 Health, wellbeing and comfort, health practices and procedures, healthy lifestyle 2.2 Safety, supervision, incident and emergency management, child protection	1 No Poverty 2 Zero Hunger 3 Good health and Wellbeing 4 Quality Education 11 Sustainable Cities and Communities 12 Responsible consumption 17 Partnerships for the Goals
3. Physical Environment 3.1 Design: fit for purpose, upkeep 3.2 Use: inclusive environment, resources support play based learning, environmentally responsible	3 Health and Well-Being 4 Quality Education 6 Clean Water and Sanitation 7 Affordable and Clean Energy 9 Industry, Innovation and Infrastructure 17 Partnerships for the Goals
4. Staffing Arrangements 4.1 Organisation of educators, Staffing arrangements: organisation of educators, continuity of staff 4.2 Professionalism: professional collaboration, professional standards	3 Health and Well-Being 5 Gender Equality 8 Decent Work and Economic Growth 11 Sustainable Cities and Communities 17 Partnerships for the Goals
5. Relationships with Children 5.1 Relationships between educators & children: positive educator to child interactions, dignity and rights of the child 5.2 Relationships between children: collaborative learning, self-regulation	1 No Poverty 2 Zero Hunger 3 Good Health and Well-Being 4 Quality Education 17 Partnerships for the Goals
6. Collaborative Partnerships with Families and Communities 6.1 Supportive relationships with families: engagement with the service, parent views are respected, families are supported 6.2 Collaborative partnerships: transitions, access and participation, community engagement	3 Good Health and Well-Being 4 Quality Education 5 Gender Equality 10 Reduced Inequalities 11 Sustainable Cities and Communities 17 Partnerships for the Goals

7. <u>Governance and Leadership</u> 7.1 Governance: service philosophy and purpose, management systems, roles and responsibilities 7.2 Leadership: continuous improvement, educational leadership, development of professionals	4 Quality Education 8 Decent Work and Economic Growth 9 Industry, Innovation and Infrastructure 10 Reduced Inequalities 11 Sustainable Cities and Communities 12 Responsible Consumption and Production 16 Peace, Justice and Strong Institutions 17 Partnerships for the Goals

Table 4
The Book Swap. Correlation between practice, SDGs and NQS.

Action/Practice	SDG	NQS
Conversations with children. Did you know not all children have books to read or libraries to visit? How can we make sure all children have equal access to books?	4. Quality education when book week programs include reaching out to the broader community. 10. Reduced inequalities when books and money are donated to those less fortunate. 11. Sustainable communities when families are encouraged to consider children beyond their own. 16. Peace, justice and strong institutions when social justice issues are championed.	1.2.1 Educators are deliberate, purposeful and thoughtful in their actions, when they provoke conversations of equity. 3.2.3 The service supports children to become environmentally and socially responsible when they consider the equity of others.
Gifting unwanted books. Children experiencing a circular economy by re-gifting and less materialism.	1. No poverty when we share the resources we have with others. 8. Economic growth when resources are shared, and finances are better utilities for other needs. 13. Climate action when less resources are manufactured.	5.2.1 Children are supported to collaborate, learn from and help each other.
Children experiencing a circular economy.	11. Sustainable cities and communities when children and families experience and are involved in a trade economy. 12. Responsible consumption**.**	6.2.3 The service builds relationships with and engages with its community.
Families supporting the literacy of Indigenous children through financial donations.	1. No Poverty when education is accessible to all. 4. Quality education for all 10. Reduced inequalities.	1.1 Program

This practice illustration reflects work by Gilbert et al. (2014) that reveals how educator's practices transform when they view children as capable, competent facilitators of their own learning and engage with them in intercultural experiences. Blair and Carroll (2008) similarly discuss social capital and its role in holistic sustainable development, where "social relationships and networks can shape local economies" (p. 42). They describe the value of building local social groups and projects which benefit the local community and economy. Social capital can also be considered a useful integrated practice in early childhood education, providing a local beneficial economy and embedding the conceptual skills for community development.

Art program: Water

This second story of practice illustrates how SDGs can be integrated into existing programs and highlights the connections to ECEfS. For over twelve years an artist in residence had taken children on a learning journey of art concepts within the teaching practices of connecting to community, nature and using recycled materials. This engagement with children extended to families with an end of year art show planned and coordinated by children, staff and families together. While the art program provided children with opportunities to explore their own mark making, line, colour and patterns (NQS 1.2.1) it also provoked conversations. The resident artist encouraged and listened to children's knowledge and thoughts on water and about water in small social groups (NQS 5.2.1). The multidimensionality of sustainable thinking was key to the art program. Recycling reduced the resources used physically and financially, cultural diversity was included in the art styles and languages employed, and conservation of the water environment (NQS 3.2.3) was a strong interest for the children. Supported by a team of collaborative educators (NQS 1.2.2; 4.2.1) in other aspects of the program, water became an art material as well as a topic for the children to explore. Indigenous perspectives about water were invited from a local elder (SDG 8), who shared his Yuggera (language and culture) wisdom. He explained the importance of conserving water, the difference between fresh and saltwater, and offered a few words in Yuggera language.

After three kindergarten terms of regular art experiences, reflective conversations and listening to children's perspectives (NQS 1.2.3) the exhibition emerged. The children's learning was represented in their unique art works, including an understanding of life below water and conservation of water habitats. This deep participation of children and educators contributed to building a true connection to place and nature which may influence lifelong motivations for living sustainably. The participatory learning processes of working together, experiencing collaborations, respect and implementing project skills supported the development of skills and dispositions required for social and political sustainability.

Towards the end of the year, in consultation with children, the exhibition was taken out into the community at public venues where families could safely attend and distance amongst the general public in line with COVID 19 restrictions (NQS 6.3.2: Community Engagement). Collaborative plans and organising (NQS 5.2.1) resulted in a new look for this art show. Rather than being held within the early childhood centre, it had transformed into a community exhibition, able to be shared with the wider community. The goal of sustainable cities and communities (SDG 11) was used well to transform educational practices as the children's artworks were displayed in larger venues throughout the community. The children designed and drew a map to guide families and the wider community to follow the artwork trail, enabling them to share in the learning journey of the young artists. From saltwater puddles to barnacles, the local community was taken on a creative journey with and about water (SDG 14: Life below water). This art program connected the SDGs and NQS in many ways, as shown in Table 5.

Table 5
Art Program: Water. Correlation between practice, SDGs and NQS

Practice	SDG	NQS
Natural and recycled resources are selected and set up in an aesthetically pleasing manner.	4. Quality education	1.2.1 Intentional teaching
Literature selection for planned shared reading and for free access.	4. Quality education	1.2.1 Intentional teaching
Open and provoking questions are used to connect children's prior knowledge. Who lives below the water? What do they need to live there? How can we help keep their habitat safe and healthy?	4. Quality education 14. Life under water	1.2.1 Intentional teaching 1.2.3 Child directed learning
Collaborative conversations during the art process. Using documentation shared with other children and families to provoke connections.	4. Quality education 10 Reduced Inequalities	1.2.1 Intentional teaching 1.2.3 Child directed learning
Structured small groups in Term 3 to build social skills and diversity.	4. Quality education 11. Sustainable cities and communities	1.2.2 Intentional teaching 5.2.1 Collaborative learning
Specialist art teacher; higher ratios. Targeted professional development.	4. Quality education	4.1.1 Organisation of educators
Community exhibition.	4. Quality education 11. Sustainable cities and communities	6.2.3 Community engagement
Focus on water.	14. Life below water. Including cognitive, socio-cultural and behavioural learning objectives	1.2.1 Intentional teaching 3.2.3 Environmentally responsible
Reducing water and learning together to protect water habitats.	12. Responsible consumption	3.2.3 Environmentally responsible

Conclusion

In this paper, we have highlighted the value of working with the SDGs and Australian NQS (ACECQA, 2018) as integral to participatory projects, bringing together tools for transformative pedagogy in the context of stories of practice. These stories demonstrate some possibilities for integrating the dimensions of sustainability with the NQS (ACECQA, 2018) to transform practices in early childhood. These community engaging art exhibitions and the book swap project show the potential to lead others, building future-orientated skills for children and leaders of tomorrow's projects through collaborative planning and participation towards an improved and sustainable community. The social capital gained by all stakeholders in these communities as they worked together to listen with children and collectively facilitated these projects are skills which will propel them forward into building social sustainability in partnerships for the SDGs.

The SDGs attune us as a global society to the critical action that must occur. Early childhood educators "are in a pivotal position to enable transformative social change towards sustainable development" (Kuzich et al., 2015). The breadth and complexity of sustainability is evidenced by the SDGs, and when these goals are matched to the NQS, educators can see clear alignments between principles of sustainability, ECEfS and ECEC. As a result, educators may realise how their pedagogies and practices contribute to a more sustainable world. Working with the SDGs can empower educators with the knowledge to demonstrate quality practice in line with the NQS (ACECQA, 2018). While the SDGs are not a didactical tool, educators seeking to build forward-thinking visions of education for sustainability may do well by mapping together the SDGs with the NQS (ACECQA, 2018). In doing so, they may recognise many of their practices are already working towards these goals and become inspired to further engage in transformative future-orientated pedagogies with children.

Integrating the SDGs with the NQS (ACECQA, 2018) offers educators a progressive, expanded pathway for understanding, demystifying and visioning sustainability, which presents opportunities for systemic change. Working with the SDGs can support educators to demonstrate quality practice in line with the NQS (ACECQA, 2018), and by doing so, transform the early childhood landscape beyond the confines of the limited view of sustainability expressed in the NQS. As influencers of early childhood pedagogy, educators are the designers and presenters of a more holistic understanding of education towards societal and global sustainability who will inspire the hopeful, transformative change required in the learning spaces of early childhood.

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Skills 4 Kids Cafes: Working to Support SDG 4 through Delivering
Early Childhood Educator Professional Learning in Partnership with Community

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ABSTRACT

Skills 4 Kids (S4K) Cafes is a program of intergenerational community skill-sharing events that offers a form of professional learning for early childhood educators to connect with SDG 4 Quality Education. The S4K model is an alternative 'side by side' approach to supporting educators to develop their pedagogical practice in the community, while working alongside children in their care. A mixed methods study was conducted with S4K Cafe participants employing questionnaires, guided conversations and field notes taken by researcher-participants. In this paper, we explore how the program bridged formal and in-formal learning for adults, prioritised community connections and capacity building, and promoted lifelong learning for all participants. We illustrate how participation in S4K Cafes addressed the aims of SDG 4, specifically Target 4.7 and Indicator 4.7.1 (ii) c which broadly relate to the provision of education for sustainable development and quality early childhood education. Findings of the study suggest that the communities-based approach of the S4K Cafes contributed toward SDG 4 aims through supporting lifelong learning for both community members and educators, forming an interactional space for contributing to a shared culture (Target 4.7), and contributing to educators' practice development (Indicator 4.7.1 (ii) c). The Cafes were found to challenge conceptions of how learning occurs by bringing community members of all ages and backgrounds (professional and non-professional) to participate and learn together. They also challenged epistemological assumptions regarding who can teach and what constitutes sustainability. Through reconstituting whose knowledge was valued, the Cafes formed their own culture, where all were recognised as contributors.

The Sustainable Development Goals (SDGs), adopted at a United Nations summit in 2015 after considerable consultation (Unterhalter, 2019), aim to provide a "shared blueprint for peace and prosperity for people and the planet, now and into the future" (United Nations, n.d.). The United Nations calls for inclusivity and equity through global partnerships in actions to achieve the SDGs by 2030. We report on a program that responds to the aims of Sustainable Development Goal (SDG) 4 to: "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (Ritchie et al., 2018, para. 9). In its response to SDG 4 the World Education Forum (2016) acknowledged the importance of diverse and engaging learning opportunities in formal and informal settings across the life span. In this sense, SDG 4 emphasises a lifelong learning perspective in the provision of equitable and inclusive quality education (Hanemann, 2019). Our study begins to address the dearth of research on the

implementation of sustainability focused programs and their effectiveness in relation to SDG 4 in non-formal early years settings and in particular, ways of supporting educators' professional learning in this space.

Our research examined SDG 4-associated outcomes related to the delivery of a community-based experiential intergenerational learning program, called 'Skills 4 Kids Cafes' (S4K Cafes). The program was designed to link young children with community members of all ages to support interactions for promoting a wide range of purposeful skill development. We explore how the program bridged formal and informal learning for children and adults, prioritised community connections and capacity building, and promoted lifelong learning. We also illustrate how participation in S4K Cafes contributed to educators' professional development. We position our discussion in the context of SDG 4, specifically Target 4.7 and Indicator 4.7.1 (ii) c.

> SDG 4 Target 4.7 states: "All learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development."

> Indicator 4.7.1 (ii) c states: "the extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in … (c) teacher education." (United Nations Educational, Scientific and Cultural Organization, 2021, p. 3)

Working towards the SDGs

Each SDG target is supported by a range of subsequent indicators. While useful in providing focus (targets) and measurables (indicators), the SDGs have been criticized for their emphasis on quantitative, metric based interpretations of success (Ball, 2012; Edwards et al., 2020; Lingard & Lewis, 2016; Unterhalter, 2019). For example, the indicators of success for Target 4.7 relate to a quantification of the *extent to which* global citizenship education and education for sustainable development are *mainstreamed* in education sectors. While important, this indicator does not engage directly with questions of education quality around global citizenship or education for sustainable development (King, 2017; Sayed & Moriarty, 2020). What is more, Ball (2012) contends that targets related to achievement and participation place too strong an emphasis on the responsibility of the individual in the neo-liberal education marketplace. Longueira Matos and Vela-Eiden (2020) advocate for a move beyond quantitative results, to a conversation that engages with "(re)thinking about what education we need in order to tackle the major global challenges" (p. 124). In addition, the collection of data for targets also appears problematic. Six years since the SDGs were adopted, the sdg-tracker website indicates that there is no currently available data for Target 4.7 (Ritchie et al., 2018). Despite these problematic aspects of collecting and monitoring data on targets and indicators, we contend that the SDG targets and indicators serve a role in focusing efforts on monitoring progress, and in this paper, we present data that contributes to addressing the data gap for Target 4.7.

The need to achieve the SDGs has been most recently affirmed at the 2019 SDGs Summit, where world leaders called for a decade of action and results for sustainable development through global action to enable great leadership, actions at local levels, and the mobilization of people across sectors (United Nations, 2019). To date, the SDGs have largely remained the responsibility of governments to enact, though clear pathways for doing so remain undefined (King, 2017). Further, Boeren (2019) suggests that to achieve Target 4.7, education and training institutions should approach sustainable development from diverse understandings *and* offer diverse experiences to facilitate learning. One way of achieving diversity is through partnerships and strong connections between micro-level (children/parents) and meso-level actors (education institutions and educators). These, according to Boeren (2016; 2019), are more likely to lead to high-quality learning opportunities; and, we argue are more likely to lead to re-thinking the education 'conversation' promoted by Longueira Matos and Vela-Eiden (2020).

The importance of representation and inclusion of diverse actors across government, institution and community sectors remains an ongoing challenge to the implementation of SDG activities. For example, McGrath and Nolan (2016) suggest that the SDG 4 intended outcome statement does not adequately account for children's, parents' or community voices. Others advocate for an acknowledgement of education as a shared responsibility in efforts to generate interaction between policymakers, educational providers, community and learners (Boeren, 2019). In Australia where this project is situated, there are policy frameworks within the early childhood education sector designed to support and enable actors at all levels to implement inclusive forms of educational responsibilities and practices. We introduce these frameworks in the next section and highlight their SDG 4 enabling features through early childhood education and care (ECEC) and community sector partnerships.

The Australian Early Childhood Education and Care Context

Several historical and demographic summaries of the nature and spread of early childhood service types in Australia illustrate a national trend toward increasing access to services and introducing regulations for quality control (See for example, Irvine & Farrell, 2013; Nailon & Beswick, 2014). Policy changes introduced in Australia from 2009 designed to improve the quality of ECEC have had a marked impact on the delivery of services to young children and their families across all early childhood sectors (Sims et al., 2015). These policy initiatives were mandated under the *National Quality Framework (NQF)* (ACECQA, revised 2017) and incorporated reporting benchmarks through the *National Quality Standard* (*NQS*). These and the *Early Years Learning Framework* (*EYLF)* (DEEWR, 2010) curriculum guide rely heavily on the capacity of educators to understand, commit to, and provide higher quality practices (Australian Government Productivity Commission, 2017).

Relevant to SDG Target 4.7 is Quality Area 6 of the *NQS* and Learning Outcome 2 of the *EYLF*. For example, *NQS* Quality Area 6 (Collaborative partnerships with families and communities) incorporates Element 6.2.3 (Community Engagement) which advocates for services to partner with families and communities to enhance children's learning and wellbeing. The *EYLF*'s Learning Outcome 2 (Children are connected with and contribute to their world) promotes a similar yet broader intent by incorporating the following indicators: children develop a sense of belonging to groups and communities; children respond to diversity with respect; children become socially responsible and show respect for the environment. Although these policy blueprints do not address SDG Target 4.7 directly, they do affirm a proactive role for Australia's ECEC sector to pursue Target 4.7's emphasis on developing citizenship-related values, which Hägglund and Pramling Samuelsson (2009) assert are central to sustainable development.

It can be argued that policies for educating children for a sustainable world including through community partnerships are not enough to generate the change in educator practices necessary for success. Pramling Samuelsson and Park (2017) suggest that supporting children's learning for sustainability requires epistemological and ontological shifts away from metric oriented mindsets and activities (such as quality assessment and rating systems) towards high level skill development promoting ethics of care for people and planet. In this sense, early childhood educators and educational sites need further (alternative) support structures and partnerships to change the learning experiences that children have, both in terms of *where, what*, and *how* they learn (Pramling Samuelsson & Park, 2017). One way of responding to the shifts called for is by fostering intergenerational community-based learning communities.

SDG Target 4.7 and in-service learning communities in ECEC

Common approaches to in-service models of professional learning in the early childhood sector involve educators engaging in activities such as short workshops, or online modules of learning during or outside of work time. These approaches are aimed at improving some element of educators' theoretical understandings and practices in the field (Waniganayake et al., 2008). Some professional learning for Australian educators is provided on-site by nominated educational leaders. According to the Australian Children's Education and Care Quality Authority (ACECQA) (2018, p. 2),

> "The role of the educational leader is primarily to collaborate with educators and provide curriculum direction and guidance; support educators to effectively implement the cycle of planning to enhance programs and practices; [and] lead the development and implementation of an effective educational program in the service."

Such approaches reflect traditional 'expert-led' or transmission methods of learning. However, as Boyle, While and Boyle (2004) and Dyment and O'Connell (2014) argue, traditional transmission of knowledge approaches are often insufficient for altering educators' practice. Some scholars maintain that models which position facilitators and trainers as 'expert' risk perpetuating the disconnect between theory and practice for educators (Fenech et al., 2010; Urban, 2008) by placing knowledge-creation, theorising and the facilitation of learning as external to educators as learners.

By comparison, communities of practice (CoP) models (Lave & Wenger, 1991; Pyrko et al., 2017; Smith et al., 2017; Wenger, 1998) disrupt traditional transmission delivery approaches and are based on the understanding that learning develops through participation in practices and through processes of identity formation. Communities of practice models also open opportunities for the inclusion of diverse participants, recognising that each individual is bringing with them unique and valuable contributions (Lave & Wenger, 1991). According to Simoncini, Lasen, and Rocco (2014), critical reflection can be developed through an individual's continuing involvement in a CoP. CoPs provide a space and time where practice can be improved as members share tacit knowledge (Iverson, 2011; Wenger et al., 2002), and all actors' experiences and knowledge are valued in the space.

An innovative approach to creating a CoP involved intergenerational sharing of knowledge and skills, referred to as Legacy Cafes, developed in Liverpool in the United Kingdom by Diane Boyd (Boyd, 2018; Boyd & McNeill, 2019). The Legacy Cafes aimed to bring together elders from the area to teach and mentor 'lost' skills (Langlands, 2018), such as sewing, knitting and cooking with local produce to local children and their families (Boyd, 2019). The Legacy Cafes were also trialled in Finland (forthcoming paper) and within the USA, as well as the Australian state of Tasmania. The Skills 4 Kids (S4K) Cafes reported here are based upon the Legacy Cafes concept, reflecting the transferability of the concept since it draws upon local culture and traditions.

The S4K Cafes were designed as a form of learning community which embraces the ethos of CoP approaches. Internationally, the implementation of the Cafe concept sits within the framework of what Davis (2015) describes as early childhood education for sustainability (ECEfS). Research into the application of the concept in Tasmania, namely S4K Cafes is shared here, revealing SDG Target 4 and specifically target 4.7-related findings.

The Skills 4 Kids Cafes Program

Located in a regional Tasmanian city, S4K Cafes were regularly attended throughout 2019 by children and educators from three ECEC centres, children and educators from a family day care scheme, parents with young children; and, community members whose ages ranged from 18 - 80 years. The program brought people together to share skills in regular (monthly) two-hour long 'cafe' sessions offering experiences that ranged from arts and crafts, music and storytelling to reading and imaginative open-ended play (Beasy, 2020). The S4K Cafes were a mechanism for intergenerational community-based learning where adults interacted in activities alongside children. In contrast to traditional approaches to (professional) learning, S4K Cafes occurred during the hours ECEC educators were responsible for groups of children. That is, educators attended each session with, rather than away from the children in their care. S4K Cafes offered a *learning with* approach - learning with children, learning with and in community and learning with each other. Here, an intersection between formal and informal learning occurred in ways that valued the diverse expertise, skills, and experiences of all participants (younger and older) in the program.

The aims of the S4K Cafes were twofold:

- to support ECEC educators to develop pedagogical practices which educate children for a sustainable world; and,

- to support lifelong learning through the bringing together of community members of all ages and social backgrounds to learn from and with each other.

These aims aligned with SDG 4 lifelong learning goals by developing an intergenerational community of learners. The focus on community building represents 'cultural contributions' aspects of SDG Target 4.7 by valuing the skills and attributes of all participants; and providing activities which emphasised sustainable lifestyles. The project also addressed indicator 4.7.1 (ii) c, through figuring new ways of mainstreaming development opportunities for a cohort of early childhood educators.

The S4K Cafes were guided by ideas of sustainable living in the design of activities emphasising social, environmental and cultural dimensions (Beasy, 2019; Emery, 2019). The social and environmental fabric of the intergenerational Cafes fostered a sense of people (including children) as collaborative 'artisans' learning about ways of valuing and working with materials and re-purposing them. Further, there was an emphasis on increasing young children's social, language and independence skills and disrupting taken-for-granted child-adult relations (where adults are expert). From the outset, cultural sustainability emphasised children's life skill development within a shared 'café' culture. For example, children were supported to produce healthy snacks for themselves. This included making fruit skewers (cutting and threading the fruit pieces), buttering, filling and cutting sandwiches, creating yoghurt and other 'dishes' with adult supervision (for safety). The children's engagement in food-oriented interactions with adults, receiving 'help as required', was an enjoyable part of each S4K Café. The 'make our own food' experience was new for many of the children. Also, new (for some) was that they could eat when they were hungry (as people do in regular cafes), sitting in small groups with an adult or two, at adult-sized tables and chairs. Overall, the children were embraced as decision makers and active agents in the program (McGrath & Nolan, 2016), able to make choices about how they participated in various activities.

The Skills 4 Kids Cafes Research

In this paper, we report on six free S4K Cafes held once each month at the headquarters of a State-wide ECEC organisation, Northern Children's Network (NCN), during periods when their outside school hours care space was not being used. The Cafes were attended by educators and children (aged from 3 to 5 years) from local early learning/child-care centres not formally associated with NCN, with two centres in regular attendance. Groups of up to eight children were accompanied by at least two educators from their respective centres. Two groups arrived and left in maxi-taxis and one group walked to and from the venue. Overall, the number of children who attended each Cafe ranged from 8 to 23 with attendance growing over the months as familiarity with the Cafes grew. Children, parents and educators were invited to engage in a range of activities set up by community members who had volunteered via associated organisations (such as Northern Early Years Group and Education for Sustainability Tasmania) and personal friendship networks. The number of community members attending each cafe ranged from 6 to 12 adults. Many of the community members had previous experiences working in the health, social services and education sectors, and the majority identified as female and of Anglo-Celtic heritage.

Along with the development of social and language skills, the activities presented opportunities for children's physical development targeting both gross and fine motor skills. Activities such as balancing on fixed beams in the playground, throwing and catching balls, digging in the sand pit and playing hopscotch and dancing to music played on the guitar formed the basis of gross motor skill development. Fine motor skills and children's literacies, creativity and persistence were targeted through arts rich activities including painting, stitching wool patterns into hessian, collage, exploring the properties of clay and using clay to 'make worlds'. While some of the arts and craft activities were precise and emphasised fine details, other arts activities were open-ended to foster creative expression and language development. The clay work for example focused on providing a medium through which children could develop stories and offered an alternative language for expression. Educators worked alongside children and community members, experimenting with the clay and sharing new techniques.

Some community members brought along activities that were personally meaningful; for example, one introduced a button box so children could sort and match the various buttons. In addition to developing skills of identifying

patterns, classifying and counting, this activity enabled the community member to share her personal history, talking about buttons from her uniform from when she was employed in the armed forces.

Research Methods

To explore the ways in which the learning community approach of the S4K Cafes supported learning for educators and community participants, a convergent mixed methods research design was employed to generate relevant data (Creswell, 2015). The research was guided by two questions:

- How do the Skills 4 Kids Cafes support lifelong learning?

- In what ways do the Skills 4 Kids Cafes address SDG Target 4.7?

Ethical approval was received from the researching institution (H0017912) for the project and methods included guided conversations (Cartmel, n.d.) at the end of each session, a short questionnaire completed towards the end of the program, and field notes (Cresswell, 2015) taken by researcher-participants. As Morse and Neihaus (2009) suggest, mixed methods research is useful for studies that are exploratory in nature and where the phenomenon under investigation is complex.

The questionnaire (n=10; 7 childcare centre educators, 3 community members) included basic demographic information about participants, four seven-point Likert scale questions designed to examine participants' knowledge about sustainability skills and their confidence in their personal sustainability skills capabilities before and at the end of the Cafes as well as their levels of enjoyment. Likert-scales are widely used in educational research and are a valid way of collecting data about how strongly participants agree or disagree with statements (Walter, 2010). Open-ended questions were included to elicit written feedback on Cafe learning; intentions regarding actions inspired by Cafes, as well as a question seeking to identify participants' preferred future Cafe activities.

A total of six guided conversations (Cartmel, n.d.) were conducted with community members at the conclusion of each of the Cafes which provided opportunities to reflect on the activities, the learnings, and moments throughout the session that were noteworthy (Brinkman, 2013). Conversations ranged from 20-60 minutes in length, were voice recorded with participants' consent and selectively transcribed. The conversations adopted Stanfield's (2000) seminal 'focused' approach to debrief about the session and identify potential teachable moments (Hyun, 2006) that could be acted upon in future Cafes.

Field notes (Cresswell, 2015) were recorded by two of the researcher-participants at the Cafes. These comprised written memos and voice recorded observations that were later transcribed. The researchers made particular note of the interactions between those attending, including the children, community members and educators. Pseudonyms are used to preserve participants' confidentiality and anonymity.

Quantitative and qualitative findings were analysed concurrently. Quantitative data was compiled and analysed using descriptive statistics in Excel and qualitative data was coded for themes manually by Kim and Sherridan. Inductive thematic analysis (Braun & Clarke, 2006) was guided by the research questions and allowed common themes within data to be identified and explored. Researcher field notes enriched and contextualised the themes identified in the survey and conversations (Creswell, 2015). Through the analysis, three broad themes were thus identified and labelled: learning in community to support lifelong learning; supporting educator practice; and, contributing to culture to support education for sustainable development. They were then linked with SDG 4 generally and Target 4.7 specifically to present as research findings.

Findings

The findings from the analysis of the educators' survey responses draw upon the self-ratings and reflective comments made about their involvement in the Cafes. Overall, the predominantly female (85% of educator

attendees), full time-employed educators said they met new people through attending the Cafes and enjoyed the experience (average rating of 5.5 on the 7-point Likert Scale). Aspects of the Cafes that educators indicated contributed to their learning accorded with the aspects of the Cafes that they also valued. For example, educators noted that the opportunity to interact with and alongside community members willing to share a range of specific child and adult-oriented skills was a highly valued component of the S4K program. In addition, the adult to child ratio was considerably higher than the required centre-based ratios and according to survey responses and through conversations with educators and community members alike, this enabled sustained interactions with children.

Study findings suggest that the communities-based approach of the S4K Cafes contributed toward SDG 4 aims through supporting lifelong learning for both community members and educators, forming an interactional space for contributing to a shared culture (Target 4.7), and contributing to educators practice development (Indicator 4.7.1 (ii) c). Each are presented below.

SDG 4 - Supporting Lifelong Learning

Guided conversations revealed how the community members participating in the Cafes found them to be an opportunity to learn about relating to young children. As the following exchange from a guided conversation indicates, an Educational Leader (Deborah) facilitated a conversation about the community members engaging with young children for the first S4K café. Community member Sally commented:

> It's funny because, I realized how quickly you lose confidence if you're not in regular contact all the time with very young children. You doubt yourself and think 'I couldn't possibly run a workshop' but when it's in a group situation like this, I feel like, at least there is something I can do. (Sally, Guided conversation NCN1)

Elise indicated she felt the same way "Because though it's been a long time since I've worked with small children, I know everyone here can help me. It's good to know they can provide extra reinforcement." (Guided conversation NCN1). In a similar way, Rebecca (Guided conversation NCN5), a community member described herself as a novice at working with children: "I'm coming in really fresh. from not being an educator, I'm a parent [with] adult children." She explained her interest in participating in the S4K Cafes:

> I was in the headspace that whatever happens [during the Cafe] is all good today, and I'm learning about what three year olds and four year olds can actually do. So, you know, if you're not an educator, you really don't know. Even though you're a parent, you still don't really understand what kids' capabilities are. (Rebecca, Guided conversation NCN5)

In this way community members perceived that the Cafes provided opportunities for advancing their understandings about working and playing with young children.

Educators too appeared to be learning skills in the S4K Cafes based on their personal interests, and such skills would contribute to their educational role. SDG 4 reflects a commitment to providing lifelong learning opportunities for all. In the Cafes, equal emphasis was placed on providing learning opportunities to both adult and child attendees. Educational Leader Deborah, who participated as a community member during the Cafes reflected on a conversation she had with an educator:

> Lindy, one of the educators was saying she felt inspired to learn to play guitar after seeing me playing it with the children. She could see how much the children loved it and how she would love to be able to do this in her centre too. (Guided conversation NCN4)

The educational leader perceived that Lindy could see the possibility of developing a new skill that would be useful in her teaching practice. Over the course of the Cafes, Deborah supported Lindy with her guitar playing and reflected on how Lindy developed some basic skills for using the guitar while working with children, explaining:

> Part of it was the fact that she saw how I wasn't particularly playing songs that you had to learn first. So, she could see that she didn't need to be a musician, but she could simply compose. The spontaneity meant that she couldn't go wrong. (Guided conversation NCN4)

The potential of the S4K Cafes as a space for lifelong learning was evidenced even further in the educator music episodes. During one Cafe, the educator and community member were playing their guitars together when a young boy came up to watch. He was invited to participate by the educator who said: "If I hold my fingers there, do you want to do what my thumb is doing?". The boy began to strum the guitar listening attentively to the music he made. These examples show how scaffolded learning experiences eventuated through the Skills 4 Kids Cafes and were made possible through the provision of resources and community integration and through a culture that fostered learning as an activity for all to engage in.

SDG Target 4.7 - Culture's contribution to sustainable development

A society's values and the way they are expressed represent a society's culture according to Hawkes (2001) who positioned culture as the fourth pillar of sustainability. The S4K Cafes may be regarded as culture-in-action bringing people of different ages, social backgrounds and interests together with the explicit intention of interacting together. Hägglund and Pramling Samuelsson (2009, p. 60) depict an image of children's learning about sustainability as including "a conviction that working for a sustainable world demands co-operation between human beings across borders of time and space". Viewed in this way, the S4K Cafes program offers a proactive strategy for contributing to a culture of sustainable development.

Educators mentioned the importance of seeing children in their care enjoy the space and enjoying the space *with* them. Comments included "I got to develop close bonds with my children and see new aspects of their learning" (Survey Educator 1). Key to being able to take the time to observe and reflect on the children's interactions with other people and the environment was having "plenty of supervision" (Survey Educator 7).

Field notes recorded by one of the researchers reflecting on these survey results noted the importance of giving educators time to become involved in the Cafes' activities and practices.

> The S4K Cafes appear to provide abundant community volunteer support, engaging activities set up for children's involvement, and healthy eating provisions for children to prepare for themselves (with community member assistance), that it enables educators to be sufficiently relieved of the barriers to their own participation so that they too can get 'hands-on' in activities and practices with children, knowing that they are surrounded by sufficient supervision and support. (Field note, researcher 2, 30/5/19)

This field note draws attention to the intensity of early childhood educators' professional roles and the wide-ranging tasks they are required to perform in their regular settings in order to engage, educate and care for children (Sims et al., 2018), while also adhering to legislated assessment, reporting and compliance requirements. The Cafes provided a safe and appropriate community learning space with human and material resources enabling playful interactions amongst all attendees including educators. In so doing, the Cafes fostered a culture of 'relaxed' participation.

Findings from the research showed that the S4K Cafes also contributed to the development of a participatory culture through positioning children as active participants in the construction of stories alongside community members and educators. Some of these stories connected back to what the children had been learning in their centres. Two rich examples surfaced in field notes and illustrated the cultural connections made:

> During the Skills 4 Kids café, a boy aged 5 spent approximately an hour re-creating the story of the three little pigs at the clay table with a community member. He used clay to build small houses for

> the pigs - forming bricks to make the brick house and crafting small twigs and grasses into clay bases to represent the stick house and straw house. An educator joined in this extended clay story session taking place. The educator entered into the story at times with the child, and a community member supported the child by bringing additional materials for the house making and listening to the child's story telling. In addition, the educator documented some of the story telling for further conversations back at the childcare centre. (Field note, researcher 2, 28/6/19)

On another occasion:

> Two boys developed a dinosaur world using clay combined with seed pods and garden cuttings to form the forest setting for the stegosaurus and pterodactyl dinosaurs that they crafted from clay - these were dinosaur names that the children volunteered, based on their own prior knowledge. The 'dinosaur world-building' provided an opportunity for extended conversations between the two children about what was happening in the forest they were creating, complete with a volcano and lava. An educator from the childcare centre attended by these boys spent time working with clay alongside them in concert with a community member, who all added to the growing conversation. When the children introduced the volcano into the scene, the educator referred back to the book about Pompeii and its volcano that they had been reading at the centre. In this way, the educator brought together their material explorations with the clay, with their learnings from their childcare centre. (Field note, researcher 2, 30/8/19)

The building of shared cultural worlds was evident in the participation and co-operation of children, educators and community members in these examples. The S4K Cafes provided embodied opportunities for the children to develop their oral language skills and story-telling through interactions with other children and adults using media such as clay 'world building'. At the same time, children and adults were exploring concepts of history, geography and the world they inhabited. The focus of Target 4.7 on culture as a contributor to sustainable development was built through these shared experiences and the intergenerational connections formed.

SDG Indicator 4.7.1 (ii) c - Contributing to educator professional learning and practice development

As materials and activities were brought to the S4K Cafes by community members, the educators were able to devote their time to taking a side-by-side approach with children, engaging in experiences that were different to their usual activities and routines in their own settings. For example, one educator commented that they had not played with clay before and proceeded to sit beside one of the children and *learn with them* to develop rolling, spiralling and blocking techniques. She indicated that this was not a typical practice for her since she was too busy setting up or packing up activities and supervising the children in her care which did not allow sufficient time (Field note, researcher 1, 30/8/19).

Experiencing different activities alongside children allowed educators to make informed decisions about what activities they would take back to their centres. Educators indicated that they highly valued "gathering activity ideas for use in our child-care centre activities where I work" (Survey Educator 3). Other educators suggested that the Cafes offered opportunities for engaging with new and different learning experiences and this formed a key component of what they valued about their involvement.

Educators intentionally developed personal skills by taking 'safe' risks during the Cafes. For example, each S4K Cafe involved the educational leader consultant (Di Nailon) "singing children into the Cafe" with some basic guitar accompaniment. She played limited chords in a rhythmic tune and sang improvised instructions, information and introductions (e.g. to enter the room and sit on the floor, where to find the bathrooms and what activities were happening today). During a later Cafe, an educator experimented singing the children back into the gathering space at the end of the session. Within a safe and supported environment with mentorship on hand, the educator in this example found the courage to create and try-out a new (for her) strategy for managing children's transitions.

Educators suggested that they valued the opportunity to network with educators from other centres and services (such as Family Day Care) and "have professional conversations with the adults" (Survey Educator 5) present. Many of the educators noted that they have limited opportunities to "network with other educators/professionals [and hear] different perspectives" (Survey Educator 4). In addition, educators noted how they valued the opportunities that the S4K Cafes provided for "networking [and] meeting new people in the community" (Survey Educator 6). In the reflective conversations conducted at the end of a Cafe, a community member confirmed this S4K Cafe outcome. She recounted that an educator had sought her advice about how they might better connect with community resources to enhance the experiences of the children in their centres. In the meantime, the educators' recurring participation in the S4K Cafes provided ongoing opportunities to experience and explore the networking and educational benefits of professional learning in this (particular) style of community of practice, contributing towards the focus of SDG Indicator 4.7.1 (ii) c on educator professional learning.

Discussion

The research findings provide some evidence that the design and implementation of S4K Cafes were important in supporting the lifelong learning aims of SDG 4. In particular, 'cultural contributions' (Target 4.7) of the S4K Cafes that focused on developing dispositions for sustainable lifestyles including inclusion, learning together and working collectively, were highlighted in comments made by community members and educators. In addition, SDG Target indicator 4.7.1 (ii) c was evidenced through the Cafes creating an alternative professional learning approach in ECEC. Boeren (2019) argues for the need to include diverse experiences if high quality SDG-related learning is to occur. In this sense, the variety of ages and social backgrounds of the S4K Cafes participants echoed Boeren's sentiment and reflected Egert, Fukkink and Eckhardt's (2018) meta-analysis of professional development (PD) in ECEC. Egert, Fukkink and Eckhardt (2018) found that ECEC PD participant heterogeneity promoted higher level outcomes for educators' understanding and practices as well as outcomes for children. The S4K Cafes brought together people with diverse knowledge and skills and afforded new learning experiences focused on young children's participation and contribution to this intergenerational community of learners.

S4K Cafes combined formal and in-formal learning by adopting interactional strategies associated with experiential learning communities as described by Lave and Wenger (1991). As a specifically designed community of practice (CoP) the Cafes created opportunities: (i) for educators to learn from and with community; (ii) for community to interact and learn with children and ECEC professionals; and, (iii) for children to learn from other children and adults of diverse ages and life experiences. Within the CoP, selected 'artisan' skills-coaching between community members and educators contributed to ECEC professional learning outcomes. Also important in this context was the learning evidenced by community members' reflections. Community members suggested that they were (re)discovering how to interact with children in safe and supported ways. S4K Cafes therefore provided ongoing relational learning interactions. According to Múñez et al. (2017) informal discussions in settings (such as CoPs) have the potential to lead to changes in participants' ECEC-related behaviours, cognition, emotions, and motivations.

Findings also indicated that the S4K Cafes supported educators by building confidence to put new skills into practice, as the instance of the educator singing children back to the gathering place indicates. ECEC policy reforms in Australia have placed a greater emphasis on the need for intentional teaching by educators to achieve desired learning outcomes (DEEWR, 2010). At the same time, internationally in the field of early childhood research there has been a foregrounding of the need for educators to recognise and value the capacities of children (Heikka et al., 2018). The S4K Cafes disrupted the status quo of an education system in which educators are positioned as key pedagogical decision-makers and opened a creative space for the capacities of children and community to emerge as agentic in pedagogical decision-making. In this sense of building capacity for all participants, the S4K Cafes engaged with SDG 4.7.1 (ii) c, through focusing on ways to support early childhood educators to develop practice to implement education that supports sustainable development.

Beasy (2018; 2019) contends that for education for sustainable development to transcend from abstract ideas of what constitutes sustainability into practice-oriented actions for sustainability, it needs to reflect the everyday worlds of the communities engaging with it. To support such transitions, Pramling Samuelsson and Park (2017) argue

for epistemological and ontological shifts in the first instance. The S4K Cafes presented a format for engaging with education for sustainable development that firstly offered opportunity for ontological shifts. The Cafes challenged conceptions of how learning occurs by bringing community members of all ages and diverse social backgrounds (both professional and non-professional) to participate and learn together. Secondly, activities in the S4K Cafes reflected the sustainability skills of the community and through doing so, challenged embedded, epistemological assumptions regarding who can teach and what constitutes sustainability and is worth learning (Beasy, 2019). Everyone's skills and needs in the space were valued (Fenech et al., 2010). Thirdly, through reconstituting whose knowledge was valued and how knowledge is made, the Cafes formed their own culture, where all were recognised as contributors (Emery, 2019), offering one approach to supporting SDG Target 4.7 through culture's contribution to sustainable development.

Limitations

The design of the current study is subject to limitations. In recognition of the limitations of our research, we make the following recommendations to those who might wish to develop a community integrated intergenerational approach to education, and in particular ECEC professional learning. First, we recommend that opportunities for guided reflection with all participants similar to those held with community volunteers at the conclusion of each S4K Cafe are integrated into the program. In our case, as educators needed to return to their ECEC centres with the children in their care, there was insufficient time to engage them in reflecting upon the sessions before departing. Future iterations of the program (scheduled to continue in the near future) will include strategies for the conduct of reflective conversations at each centre. This, we believe, will support deeper understandings and activities for achieving SDG goals more generally, and in ways that focus on the conversations necessary to (re)think the approaches to education necessary for tackling major global challenges, at least in the early years. In addition, we acknowledge that participants in this iteration of the S4K Cafe program were largely homogenous across both ethnicity (largely Anglo-Celtic) and gender (largely female). We found the S4K program useful for the development of intergenerational understandings and see its potential for building intercultural understandings among attendees and suggest further iterations of the program to support participation that is more heterogeneous.

Conclusion

The early years are a foundational stage in which children enter into society. It is an important time for children to learn practices that support sustainable lifestyles. SDG 4 ambitiously demands education for all that supports sustainable development. Initiatives such as the S4K Cafes create conditions in which lifelong education for sustainable development become possible and exemplify how SDG 4, specifically SDG 4.7, 4.7.1 (ii) c., can be implemented in the early childhood sector. Policy and curriculum frameworks such as the National Quality Framework (ACECQA, revised 2017) and the Early Years Learning Framework in Australia (DEEWR, 2010), position education for sustainable development and the aspirations of SDG Target 4.7 in the domain of ECEC.

SDG Target 4.7 recognises the numerous complexities in constituting the educational needs of supporting sustainable development. This SDG Target, in contrast to so many of the other Targets under SDG 4 (and other SDGs), does not have 'strict' quantitative metrics that accompany it - perhaps recognising the integrated and multidimensional composition required in supporting sustainable lifestyles. In conducting this research, we brought into relief the complexity of isolating the experiences and instances of education for sustainable development in ECEC contexts and processes of culture building. In our attempts to analyse what goes on in a S4K Cafe, and in isolating out each of the individual elements that contributed to Targets and Indicators of SDG 4, there is a risk that the ways elements worked together synergistically is lost. Seeking to simplify and reduce down culture building, or lifelong learning to its constituent parts, fails to give recognition to the interactions that necessarily occur in concert. In this paper, we have sought to establish some ways of documenting the often intangible, 'felt' experiences of these phenomena as means of paving forward paths to evidence SDG 4.7, but at the same time, caution those seeking to replicate to take care that the complexity of relations are not lost.

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Student Authors, Children's Literature and Early Childhood Education for Sustainability: Findings from a Pedagogic Research Project

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ABSTRACT

The focus on early childhood education for sustainability within children's literature is part of a mindful shift towards a more critical praxis with young children, families, communities and students in higher education. This paper reports on qualitative pedagogic research undertaken as part of a first-year module in an undergraduate Early Childhood Studies degree programme at Liverpool John Moores University (LJMU), United Kingdom (UK). The research involved the creation of children's literature (e-books) by students using *Book Creator*, focussed on one or more of the Sustainable Development Goals (SDGs). The overarching aim of the project was to explore how the process of creating children's literature to facilitate early childhood education for sustainability supports students to engage in cultural production. In this paper, we present an analysis of the students' e-books and supporting rationales for their storybook creation. The study findings were that student-authors demonstrated different constructions of children, cognisance of the pedagogical purpose and different ways of knowing through the storybook creation. These findings contribute to existing debates concerned with early childhood literature and sustainability, and students as authors.

Keywords: children's books; children's literature; early childhood; pedagogic research; sustainable development goals; sustainability.

Whilst there has been growing emphasis on embedding sustainability into the higher education curriculum in the last two decades (Blewitt & Cullingford, 2004; Wals & Jickling, 2002), many initiatives around Education for Sustainable Development (ESD) have been argued to be pre-occupied with problem solving, and heavily connected to scientism (Jickling & Sterling, 2017). Further, Jickling and Sterling (2017, p. 2) argue the importance of a new vision for sustainability education rather than "adding new bits to the [existing] curriculum", thereby inviting educators to respond to educational imperatives related to ecological crisis and human-nature relationships. The Early Childhood Studies programme at Liverpool John Moores University (LJMU) was developed with global relevance and cognisance of the UN Decade of Education for Sustainable Development (DESD, 2005-2014) and the Sustainable Development Goals (SDGs) (UNESCO, 2015-2030), while remaining focused on local policy contexts and relatable pedagogies for those choosing to work with babies, young children and their families.

The ambition to embed ESD into the BA (Hons) Early Childhood Studies programme was an attempt to engage students in ESD as an emergent phenomenon (Siraj Blatchford et al., 2017), and was realised in 2016 with the first iteration of an original and distinct validated programme. Thomas (2002, p. 116) asserts that a sound programme in higher education should emerge as a consequence of a well-constructed educational programme and not be, what he terms, "a gimmicky free-standing initiative". As part of the validation process, the design for a first-year undergraduate module on pedagogical approaches included explicit reference to sustainability, democracy and social justice.

There has been increasing interest in early childhood education and sustainability, including a landmark collection by UNESCO (2008) *The Contribution of Early Childhood Education to a Sustainable Society*. However, as later argued (Davis & Elliott, 2014), many papers in this collection were "aspirational, rather than based on local research or practice in education for sustainability" (p. 4). In response, this research paper highlights how pre-service early childhood education teachers were encouraged to view early childhood as a key period to foster caring attitudes and empathy vis-à-vis the natural environment (SDG 15 Life on Land), learn about gender inequalities (SDG 5 Gender Equality), and equal rights and responsibilities (SDG 10 Reduced Inequalities).

We report on pedagogic research with first-year undergraduate students enrolled in an Early Childhood Studies degree at LJMU. The study involved student creation of early childhood literature (e-books), focussed around sustainability themes. In this research context, the SDGs were discussed with students as a vehicle for the development of eco-literacy which exists not only "on the page" (Kress, 2003, p. 95), i.e. within literacy practices, but also in the social practices which surround it. We explore the pedagogic processes that enabled (re-)orientations of higher education students' mind-sets towards sustainability and promoted change agency for sustainability. Transformative learning through sustainability education is often guided by principles of *heads, hands and heart* for higher education (Singleton, 2015), implying recognition of cognitive psychomotor and affective domains of learning to create a transformative educational experience. The overarching study aim was to explore how the process of creating children's literature might support students to engage in cultural production (Kuttner, 2015, p. 70) around early childhood education for sustainability. According to Kuttner (2015), cultural production refers to the creation and consumption of different forms of symbolic creativity, including mass media, language and the arts. Through the storybook creation as cultural production, the student-authors demonstrated different constructions of children, cognisance of the book's pedagogical purpose and different ways of knowing.

In this paper, we first review published works on early childhood literature and sustainability to locate this study. We then describe the research design adopted, focussing on student workshop sessions, e-books and supporting rationales. The key findings are elaborated around three themes and we conclude with a recommendation for future pedagogical research related to early childhood literature and education for sustainability.

Early childhood literature and education for sustainability

Storybooks in early childhood are reported to have a range of benefits, for instance: enhancing vocabulary and comprehensive language skills (Collins, 2010; Massey, 2013); offering character education tools (Turan & Ulutas, 2016); enabling children to make intertextual connections (Sipe, 2000); eliciting emotions (Pantaleo, 2002); and, being a "springboard to place-based embodied learning" (Wason-Ellam, 2010, p. 279). However, there have been fewer studies exploring the benefits of using children's literature to teach about global citizenship (Bradbery, 2013). This is significant when considering the The United Nations 2030 Agenda for Sustainable Development (UNESCO, 2015) pledges to foster an ethic of global citizenship and shared responsibility, alongside inter-cultural understandings, tolerance and mutual respect. Further, this lack of academic research is also significant when considering that ESD is particularly concerned with global citizenship; that is, education that will prepare young people for life in the 21st century.

The important role of text and particularly illustration in children's storybooks has long been documented (e.g. Anstey & Bull, 2000; Fang, 1996; Marriott & Evans, 1998; Lysaker, 2006). Illustrations add a "multi-layered richness and depth to the author's words" (Wason-Ellam, 2010, p. 279). Arguing that images in children's books can leave a more lasting impression in young learners' minds than text, Muthukrishnan and Kelley (2017) emphasise the importance for children's books to use images as a teaching tool, especially regarding global issues such as environmental sustainability. To echo Muthukrishnan and Kelley (2017), pictures alone in children's books can convey a critical message to young readers.

There has been consideration in extant literature about electronic versus traditional storybooks (e.g. Bus, Takacs & Kegal, 2015; Moody, Justice & Cabell, 2010). In particular, Moody, Justice and Cabell (2010) found that children displayed higher levels of persistence during the adult-led e-storybook compared to the traditional storybook. However, children communicated more during the traditional storybook format. In our study, considering that the

focus of the proposed storybooks was related to sustainability, we encouraged students to create e-books due to the environmental benefits; for instance, they do not use paper and ink nor require transportation.

There is a deficit of scholarship about storybooks which include sustainability themes, concepts and motifs. Key exceptions include Gonen and Guler's (2011) discussion of the environment and its place in children's picture storybooks, Muthukrishnan and Kelley's (2017) investigation of depictions about sustainability in children's books, Medress' (2008) exploration of storybooks as a teaching tool for sustainability, and Holm's (2012) examination of environmental empathy in children's books. Gonen and Guler (2011) found that environment-related concepts predominated in storybooks for children aged six years and over, and recommended that younger children's storybooks should feature environmental concepts as well. It is only in the last decade that education for sustainability has become a key question and research focus for early childhood education (Elliott, Ärlemalm-Hagsér & Davis, 2020). The debate appears split between those who claim that "young children should be sheltered from all the problems in the world" (Pramling Samuelsson, 2011, p. 103) and see children as innocent and in need of protection; and others, (Kahriman-Ozturk, Olgan & Guler, 2012; Powell & Somerville, 2018; Spearman & Eckhoff, 2012) who argue that "children need to be made aware that what affects the world affects them as well" (Burnouf, 2004, p. 3). Children have a role as global citizens and those adopting this latter lens see education for sustainability in early childhood as "essential, not an optional" (Elliott, 2010, p. 34).

In recent years, more storybooks have been published internationally which address environmental concepts (Sousa et al., 2017), perhaps owing to a renewed narrative around sustainability with sustainability celebrities Greta Thunberg and David Attenborough. Correlating with this is an increased recognition that developing understandings of the importance of sustainable futures is crucial in promoting children's development of respect for the natural environment (Littledyke & McCrea, 2009; Spearman & Eckhoff, 2012), and to become global citizens (Elliott, Ärlemalm-Hagsér & Davis, 2020). As Medress (2008, p. 1) poetically puts it: "if today's children learn to make decisions with the environment in mind, tomorrow's future will be cleaner, greener, and energy leaner". However, the difficulty for parents and practitioners lies in locating these books. Whilst some books are 'badged' as focussed on sustainability through green colouring and recycling logos, the messages of environmental protection and broader sustainability themes, for instance of gender inequalities (SDG 5 Gender Equality), poverty (SDG 1 No Poverty and SDG 2 Zero Hunger), and racism (SGD 10 Reduced Inequalities), are covert in others. In many books, endearing settings and anthropomorphic characters foreground narratives around ecological sustainability, diversity, and equality; for instance, *The Polar Bears' Home* by Lara Bergen (2008) speaks to young children about global warming, whilst scaffolding children to think about notions of *home* from a personal and global perspective.

There is a deficit of academic literature focussed on student-authored children's books. Discussing the adult authoring of children's literature, Bavidge (2006, p. 321) is quick to point out that adult authoring of children's literature does not represent a child's view of the world, rather it represents **"a privileged space in which we witness the operations of adult dialogues with children"**. Bavidge (2006) continues that, nonetheless, children's literature provides an important opportunity for the authoring adults to represent the ways in which the world is interpreted by and explained to children. In terms of engaging with children's literature as an adult, interestingly, existing literature supports reading narrative children's texts as a tool for developing social cognitive skills among adults (Dodell-Feder & Tamir, 2018; Mumper and Gerrig, 2017). In this study, we report on pedagogic research undertaken with student-authors, to contribute to the identified gap in research literature on student-authored children's books and further promote student engagement with early childhood education for sustainability. We now outline the research design employed in this study.

Research Design

In the following pages, we outline the research design including attention to the theoretical and methodological framing, the data creation methods, ethics, data analysis and study limitations.

Theoretical and methodological framing

This qualitative research design aligns with sustainability pedagogies in higher education and emerged from our recognition that as tutor-researchers, there is a fundamental need to realise pedagogies which reflect a desire to understand the 'other'. Our values and world views inevitably influenced the choice of a framework or ontological position, and we were guided by the exploratory methodologies of social constructionism (Denzin & Lincoln, 2013) and Constructivist Grounded Theory (CGT) (Charmaz, 2014). Social constructionism (Denzin & Lincoln, 2013) 'assumes a relativist ontology with many possible realities' (p. 26) and a CGT approach postulated by Kathy Charmaz (2006; 2014), enables a reflective stance about the possibilities of adopting a disparate range of theoretical ideas through analysis of the data.

The nature of the research methodology was aligned with the pedagogic interventions during the module delivery which included dedicated book making workshops. During the workshop, the students engaged in a search for children's literature with themes associated with sustainable development. The students were referred to specific online sites hosting books, for instance *Letterbox Library, Green Reads,* and *Stonewall Books*. They were later invited to create a storybook for young children using *Book Creator* (see Bookcreator.com), an online platform for creating digital books combining text, images, audio and video.

We were also cognisant of the dangers of teacher/researcher bias and as Charmaz (2014) herself recognised qualitative research can never be fully free of bias; however, we were keen to share our findings in a published research paper for future iterations of the module.

Student workshop sessions

This research was developed with students through workshop sessions to establish shared understandings of education for sustainability, with the aim of developing a collaborative inquiry (Bray et al., 2000, p. 19) to "demystify and democratize the process of constructing knowledge". During tutor-researcher delivered presentations and interactive workshop activities, the students were introduced to the SDGs as both an appeal and instruction. The underpinning aim was to foster achievement of sustainable futures by addressing global challenges such as poverty, inequity, climate change, environmental degradation, peace and justice. The language around sustainability is often considered to be confusing and ubiquitous (Kopnina, 2014) and the visual representation of the 17 SDGs and the associated (169) targets (UNESCO, 2015) have been noted as non-legally binding, encyclopaedic, and challenging in their overwhelming breadth (Easterly, 2015). Specifically, King (2017) asks whether the aspirations for expanded rights to education are prone to getting lost in translation. Despite these challenges, many in the early childhood education community have welcomed the inclusion of early childhood education in the SDGs, but the *readiness* discourse remains a contentious issue (Moss & Urban, 2017).

Multiple pillars or dimensions are often employed to define sustainability, for example socio-cultural, environmental and economic. Whilst the environmental pillar is well recognised in education for sustainability discussions, researching children's literature beyond a 'saving the world' narrative helps to move beyond the environmental pillar to acknowledge a more holistic appreciation of the socio-cultural and economic pillars (World Commission on Environment and Development, 1987). Appreciating this holistic construct, the idea of early childhood education and environmental stewardship (Taylor, 2017) and children as agents of environmental change (Walker, 2017) were broadened within the workshops to consider issues related to intersectionality and difference, including prejudice, refugees, xenophobia, racism and human rights. These tie into debates around advocating for peace and social justice through children's literature (e.g. Yokota & Kolar, 2008) and an expanded rights framework postulated by Davis (2014).

We also presented students with a range of storybooks during workshops sessions, including multicultural literature, which Cai (2008) explains describes people and events about countries and cultures distinct from the dominant ones. We specifically asked the students to pay attention to how images were used as provocations to contribute to a more holistic exploration of 'British values' within early childhood education, whilst presenting opportunities to "consider respect, tolerance and social justice rather than a narrow interpretation of Britishness" (Bourn et al, 2016,

p. 18). From this, students explored how such multicultural literature reflected the racial, ethnic and social diversity characteristic of our society (Bishop, 1997), and is, albeit sometimes subliminally, key to tackling bias.

As tutor-researchers leading the module, we invited two children's authors Heather J. Ray and Kaya Nash to participate and discuss their rationales for creating children's picture storybooks related to well-being and diversity, respectively.

Robin's Sweet Heartbeat (Ray, 2020)

This self-published book is the story of a young bird named Robin that hears his mother's heartbeat for the first time and sets out on a journey to discover where the noise is coming from. The students were introduced to the story during a guest lecture via Skype, and one of the signifying features the author used to create meaning was intertextual reference (Gamble, 2013). Whilst not explicitly badged within the sustainability genre, Ray (2020) identified the book as a resource for teaching mindfulness in early childhood education settings and noted the children "enjoy practising meditation to feel the beats of their heart and listen to the heartbeat of others". The story offered children the opportunity to help Robin find the source of the beats captured in the text, "Ba Boom, Ba Boom". The students made a connection between the narrative and SDG 3 Good Health and Well-being and considered how the book could facilitate dialogue around children's mental health and well-being.

Gracie's Birthday Party (Nash, 2019)

This storybook supports conversations about diversity, inclusion and difference. The book projects a range of families arriving at Gracie's house for her birthday party with presents in a variety of shapes and colours. Whilst the obvious pedagogical function of the book was to teach young readers about shapes and colours, the unspoken diversity of families arriving at the party provoked thinking around questions of wider social and political interest, including disability, race, gender and sexuality. In her guest lecture, Nash discussed the inclusion of images that normalised authentic representations of people in the local community. This resonated with the key ethos embedded in positive early childhood pedagogies and early childhood education for sustainability (Boyd, Hirst & Siraj-Blatchford, 2018). Students were able to make a connection to SDG 10 Reduced Inequalities. The differences among the characters in *Gracie's Party* were not made explicit as part of the narrative, only depicted visually. Arguably, this is important to avoid further perpetuating inequalities.

Student's e-books

Following the initial workshops, students were then invited to create an e-book using *Book Creator*. Class time was scheduled for the students to form and develop ideas, and a dedicated workshop session provided space and time for their book production. The topic of the storybook was open for the students to decide, as long as they could make connections with literature and key resources related to sustainability. The books were required to be eight pages in length. The students were taught the basics of how to use *Book Creator*, including importing images and videos, adding text, and recording audio. Some students chose to draw images and upload them; and, others imported copyright free images or photographs they had taken. The completed e-books were not graded, however the process of creating the e-books supports Kuttner's (2015, p. 70) previously defined notion of "cultural production".

Student e-book rationales

Students used their completed e-books as artefacts to scaffold their creation of a written rationale to justify the value of the storybook in the development of a sustainability mind-set. The rationales were graded as part of the module assessment, plus utilised as study data for the researchers to read the storybooks critically and examine their structures. The assessment criteria were employed to grade student ability to explain key sustainability terms and make connections to international policies/organisations, amongst other elements. It was in these aspects that tutor-researchers were seeking demonstration of knowledge and understandings of sustainability and UNESCO's SDGs.

A note on ethics

The students were informed about the research study in the first module session and were given participant information sheets outlining the details. The students were reminded about the research at regular intervals throughout the semester and the information sheet was placed in the Key Module Information section of our virtual learning platform, so students could access this at any time. Significantly, *after* grades and feedback for the module assessment were released, students were invited to opt into the research study and to consent to the use of their work as data. This meant students should not have been concerned about any unconscious bias in the marking should they prefer not to participate. Of the 58 students enrolled in the module, 24 opted to participate in the research and all data was anonymised.

Data analysis

Applying a CGT approach (Charmaz, 2014), we adopted a thematic approach to analysing the data from the student e-books and written rationales. At this juncture, we acknowledge the subjectivity of the tutor-researchers and the potential impact of this on data interpretation. Following Silverio (2018), to have no *a priori* assumptions entirely is a somewhat unrealistic expectation for researchers; instead, we did our best to exclude preconceptions within our data analysis through reflective practice around ontology and epistemology.

We borrowed from Silverio, Wilkinson and Wilkinson's (2020) use of grounded theory in studies of literature and visual media. We hand-coded the student rationales using a coding grid. The coding grid had four columns, the first contained the rationales created by students which were copied verbatim into the table, the second denoted which researcher's online library the book was stored in, the third enabled us to record the book title, focus, and illustrative details, and the fourth provided space for us to document key themes. In line with a CGT approach, the data analysis was an iterative process. First we undertook open coding, using verbatim words from the rationales analysed. Once the first data coding was completed, we undertook a second data coding (axial coding). We returned to the data multiple times adopting a process of constant comparison, grouping some of the open codes together under a single code; and also, comparing between the analyses of both researchers to ensure thorough interrogation of data and thematic concordance (Silverio, Wilkinson & Wilkinson, 2020). We then moved on to theme development and yielded three key themes from the selective coding. We refer the reader to Silverio, Wilkinson and Wilkinson's (2020) for a detailed step-by-step guide to data analysis of visual media.

Findings and discussion

The three key themes identified in our analysis were constructions of children, pedagogical purpose and different ways of knowing. We now discuss each of these in turn, supported by illustrative quotes from the student data.

Constructions of children

Constructions of children and childhood is a key debate in early childhood research and was a key theme identified through our analysis. The construction of children as innocent was the most prevalent construction we identified. For instance, a student noted: "*children are generally uninformed about adverse events as a form of protection*" (student comment from rationale), connecting to Sorin's (2005) argument that children are to be protected against the negative aspects of the world. Medress (2008) considers the value of storybooks as a teaching tool for sustainability and argues that environmental issues are often complex, can be disheartening and the jargon fails to translate to younger children. For example, a comment garnered from her data cites the impossibility of "teaching "sustainability" to very young kids" (Medress, 2008, p. 9).

In many of the rationales analysed, children were positioned in ways resonating with Rousseau's romanticism (Wokler, 2001), characterised by students in their justifications for choice of language, colour and illustrative forms. Notably, of the 24 books we reviewed, 12 featured imported cartoon images which were explicitly noted as 'suitable'

for young children, with tacit suggestions that the genre may ease any contamination of children's minds with real world issues:

> *Throughout "Maisie's adventures" the colours used are mostly greens, blues, yellows and oranges, along with other bright colours. These colours were chosen to make the book appealing to children and represent happiness.* (Student comment from rationale)

> *This is the reason for Myrtle's Adventure consisting of bright colours throughout until the statement about plastic pollution, pollution is not generally associated with happiness as it is a negative aspect of life.* (Student comment from rationale)

As evident from the excerpts above, students particularly celebrated the use of bright colours for children. This was readily witnessed in the e-books, as depicted in Figure 1:

Figure 1: Illustration from Student e-book Fido's First Day Out

This construction of children as innocent, whilst not entirely surprising, fails to acknowledge the notion of children as competent. Davis et al. (2009), making recommendations for education for sustainable development in early childhood, notes that children are active agents in their own lives, capable of engaging with complex environmental and social issues. This steers away from romanticised notions of childhood as an arena of innocent play that positions all children as leading sheltered, safe and happy lives. Children as capable citizens was a key feature of the module with signage aligning early childhood education with pedagogies and principles of education for sustainability, yet appeared to be overlooked by some students.

Of the 24 books reviewed, seven students handcrafted their own images with overt recognition of the need for exposure of the lived realities of some children and two of the stories dealt with death (of marine life). Thus, contradictory to the excerpts presented above, the excerpt and associated illustration from the student below (see Figure 2) exhibited their understandings of the importance of realism in children's sustainability literature:

> *In the bedroom, the walls are cracked and dirty, the picture frame is not straight and the bedroom is not immaculate. This represents real life as not everything is perfect, which a lot of books and children's media suggests.* (Student comment from rationale)

Figure 2: Illustration from Student e-book Maisie's Adventure

Thus, student authors of the analysed books adopted both sides of the debate introduced earlier in this paper, that of 'sheltering versus exposing' children to the problems in the world (Pramling Samuelsson, 2011). The student author of Maisie's Adventure (see Figure 2) clearly adopted the stance held by Spearman and Eckhoff (2012) that children should be made aware of the imperfections in the world. The student author of Our Journey to School, in making connections to SDG 3 Good Health and Well-being and SDG 1 No Poverty, adopted this stance too:

> *Sensitive subjects such as mental health, family relationships and wealth standing, are important topics that children need addressing to confirm a more connected community to which they belong. This outlines and explains the importance of using a book as a resource to create interest for children on challenging topics that the world faces daily. It is about bringing these subjects to the attention of children in a subliminal way as it provides a sense of safety and openness.* (Student comment from rationale)

Whilst Maisie's Adventure and Our Journey to School communicate this realism in a subtle way, the author of Adventures on Turtle Bay, responding to SDG 14 Life Below Water, adopted a more explicit approach (see Figure 3):

> *The ending of the book displays the death of a turtle, as a result of eating plastic. In most children's books the 'happy ending' is usually portrayed, however, the focus of this book is to show children the reality of the world and how actions have consequences.* (Student comment from rationale)
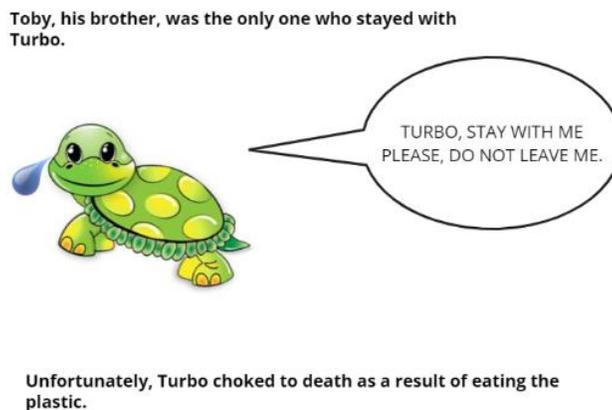
Figure 3: Illustration from Student e-book Adventures on Turtle Bay

There is, however, a feeling when viewing Figure 3 that the language used to communicate the death of the turtle "choked to death" may be too frank for young readers. We consider this in relation to debates on the idea of 'facts not fear' when teaching children about the environment (Sanera & Shaw, 1996). Researchers have identified that the children who were most confident that climate change would not overwhelm them, attended schools that had replaced fear with factual information and practical strategies for sustainability (Alexander, 2010). Further, between the ages of 3-6 years, children will not necessarily understand that death is final and there is a need to explain clearly that once someone (or something) has died, they will not come back to life (Fiddelaers-Jaspers, 2015). Thus, there is a need for further conversations between parent/teacher and child about what is presented in this storybook. This leads us neatly to our next theme, pedagogical purpose.

Pedagogical purpose

The second key theme identified through our analysis was the pedagogical purpose attributed to the student-authored e-books. Scrutiny of the language in the student rationales exposed explicit references to traditional developmental legacies. For example, where the stories were composed to *teach* about education for sustainability, the apparent intent was to transmit information from adult as expert to child as novice. The following excerpts highlight the student's understanding of such "caught and taught" (White, 2017, p. 137) pedagogies:

> *In a school setting, the book could be used as a starting point for education for sustainability. It could be followed by trips to the beach where children could conduct a beach clean and learn hands-on about plastic pollution and recycling.* (Student comment from rationale)

> *By encouraging children to ask questions, there is no unrealistic pressure to gain knowledge about the subject. Instead, the practitioner uses patience and understanding by allowing the child to choose what they want to know; the practitioner can then expand on the subject, subliminally giving the child more knowledge without pressurising the child.* (Student comment from rationale)

In these excerpts, both students also imply the value of adult-child conversations about their stories. This can be interpreted in relation to Vygotsky's social cultural theory of child development and co-construction of meanings through conversation (Milburn et al., 2014). Whilst casting shared reading as a social practice, student rationales often posed shared reading as an emotional situation where any subliminal messages could be articulated as a positive approach to examining others' perspectives. Here we were drawn to Bakhtin's concept of *utterance* as "the primary link in a chain of communication and *heteroglossia* as the complex space in which language gives rise to certain meanings in social discourse" (White, 2017, p. 131). The following excerpt from a student rationale illustrates how such communication can add meaning:

> *Like many children's books, this book can be used as a resource to aid an open-ended, pedagogical approach…The reader and the child may discuss what they think the adventures will be about. Other conversations may be provoked such as what healthy foods the child likes to eat or what they would like to try.* (Student comment from rationale)

Here the pedagogical purpose of the storybook was significant. Without such conversations between parent/teacher and child, there is a fear that children will become "smug crusaders whose foundation of knowledge is shaky at best" (Sanera & Shaw, 1996, p. 36). Applying Bakhtin's heteroglossia to early childhood, the words and illustrations produced by the students become "half someone else's" (White, 2017, p. 135). The student-author of Maisie's Adventure, focussing on SDG 10 Reduced Inequalities, articulates the importance of using the e-book as an open-ended resource *with* children (see Figure 4):

> *When Maisie takes a trip to the bakery in the storybook, she goes with her Uncle Patrick and Uncle Dan who are a LGBT couple. This isn't talked about or mentioned in the book at any point, but it can be seen through the illustrations. This allows the child to ask questions from their own accord [sic]. Some children may not, however if they do, then it is a good opportunity for the parent to discuss with the child about these modern, accepting times.* (Student comment from rationale)

Figure 4: Illustration from Student e-book Maisie's Adventure

The student author of Maisie's Adventure promotes a dialogic view of learning and young children as capable and sophisticated language users, who are able to shape others in the same way they are shaped through dialogue themselves (White, 2017). This suggestion of agency reflects the idea of "children as peers instead of inferiors" (Medress, 2008, p. 23). Much emphasis is placed on dialogue in early childhood education, not least the pedagogy of listening as embedded in the highly regarded Reggio Emilia education approach (Rinaldi, 2006). In addition, the promotion of sustained shared thinking within the UK English Early Years Foundation Stage (English Department for Education (DfE), 2017) is an effective pedagogical strategy to establish intersubjectivity or what Oates and Grayson (2004, p. 56) frame as "a meeting of minds".

During the student workshops, we discussed the Early Childhood Studies Subject Benchmark Statement (Quality Assurance Agency (QAA) 2014; 2019) which describes the national academic standards required of graduates in our university degree programme. The Subject Benchmark Statement for Early Childhood Studies highlights the advocacy role of students. Perhaps owing to the introduction of this document, recurrent in our analysis was the notion of students as advocates when authoring their e-books. Here the pedagogical purpose of student-authored storybooks was realised as the 'extra benefit' of the learned content. For instance, the student-author of Myrtle's Adventure, responding to SDG 14 Life Below Water, provided a hyperlink to "*6 tips to help save our oceans*" at the bookend. Other examples of students as advocate are evident in the following excerpts:

> *The reason behind the creation of Myrtle's Adventure children's book was to spread awareness of the current sustainable crisis, which is pollution.* (Student comment from rationale)

> *I want those children suffering with their mental health to identify with my book and feel as though they are being represented within the books [sic] narrative…This is why I felt the duty to make this book, to really ignite the conversation regarding mental health to encourage the government to invest in such an important cause as this one.* (Student comment from rationale)

> *I wrote this book to broaden children's knowledge of diversity within their own community and to enhance the message of bullying and why it is happening around us and how we can stop it.* (Student comment from rationale)

Here we consider it helpful to reference Gaard's (2008, p. 14) notion of an eco-pedagogy which "distinguishes itself from a type of environmental education that seeks accommodation within a global neoliberal framework, championing sustainable development without challenging the unsustainability of an economy advocating endless growth". This mirrors the call by Elliott, Ärlemalm-Hagsér and Davis (2020, xxi) for researchers "to be a bigger, bolder radical activist group expressing our values and advocating for significant social and political change" through early childhood education for sustainability research. This advocacy features explicitly in the UK Subject Benchmark Statement for Early Childhood Studies (QAA, 2019, p. 4) and invites students as researchers to "challenge gender and other inequalities and facilitate recognition of the rights of children to actively participate in their world", also connecting to SDG 5 Gender Equality and SDG 10 Reduced Inequalities. Thus, student-authors invited readers to adopt a more critically reflective pedagogical stance in the consumption of children's sustainability literature.

Gaard's (2008, p. 15) advocacy for "stories for democracy, social justice and post colonialism" particularly resonates with early childhood education for sustainability and "little S sustainability" (Spearman & Eckhoff, 2012, p. 15) which concentrates on day-to-day activities and experiences which invite young children to make sense of their own worlds. This segues to our third theme related to different ways to *understand* and *know* the world.

Different ways of knowing

The third theme identified through our analysis is characterised as 'different ways of knowing'. Here we argue for the university classroom as a fertile space for exploring what Moss (2019, p. 4) refers to as "the importance of narratives, that is the stories we hear and tell, for how we interpret or make meaning, of ourselves and our lives, of our families and other relationships, and about what goes on in the world around us". The English Statutory Early Years Foundation Stage (EYFS) (DfE, 2017) features broadly in the first year of the Early Childhood Studies degree programme, with acknowledgement of the overarching principles of a unique child, positive relationships, enabling environments and the individuality of development and learning. Thus, it was no surprise that student rationales were peppered with assertive references to the EYFS with explicit connections to the areas of learning and development, the characteristics of effective learning and the (often contested) notion of 'British values' (DfE, 2017). The student-authored e-book Mr Cloud, responding to SDG 3 Good Health and Well-being and SDG 4 Quality Education, was one of the simplest stories which portrayed a rainy cloud battling to develop a sense of worth as he measured himself against the useful sunny clouds (see Figure 5):


Figure 5: Illustration from Student e-book Mr Cloud

Despite its simplicity, the rationale for this story challenged superficial interpretations of the requirements within the EYFS (DfE, 2017). The student-author of Mr Cloud considered the illustrations in *Gracie's Birthday Party* (Nash, 2019), with tacit reference to the concept of othering and inclusion:

> *Gracie's Birthday Party' by Kaya Nash (2019) …had hidden messages about diversity embedded into it and promoted positive attitudes towards others which is an example of 'British values' which are incorporated into the EYFS, as well as Development Matters (DfE, 2017).* (Student comment from rationale)

She also made connections to *Robin's Sweet Heartbeat* (Ray, 2020) around interconnectivity, some EYFS areas of learning and development (DfE, 2017), and recognised the SDGs:

> *Robin's Sweet Heartbeat (Ray, 2020) was set around mindfulnes to explore our inner world through our heartbeat. The underlying message is that we may all look different, but we all have heartbeats that connect us to each other. This ties in with education for social and cultural sustainabilty as children are being taught to offer mutual respect to those who may appear different (Boyd, Hirst and McNeill, 2017). This is an aspect I wanted to incorporate within my book, to respect those who may seem different to us when the sunny cloud reminds Mr. Cloud that it is okay to be different.*

> *In recognising the 17 SDGs, the book relates to SDG 4* [Quality Education] *as it is proposed to enhance children's learning and understanding of the world around them which also reflects the specific area of learning within the EYFS (DfE, 2017).* (Student comments from rationale)

Understanding the World is a specific learning and development area in the EYFS (DfE, 2017) and this can be negotiated through the critical pedagogies most often associated with education for sustainability. In particular, critical theorist Freire's notion of "reading the world" before "reading the word" (Gruenewald, 2003, p. 5) as social sustainability, demands an ethos of compassion, respect for difference, equality and fairness. As noted in a chapter reviewing how children come to understand their worlds, early childhood education for sustainabilty provides a vision of early childhood education and care that seeks to balance human/non-human and economic well-being with cultural traditions and respect for the environment (Hirst, 2021).

Some students employed their storybook as a stimulus for exploring points of difference. Bourn et al. (2016, p. 8) argue that "the tendency in England has been to focus on the social relevance of education in terms of addressing *problems*, such as global terrorism, through attempts to *prevent* radicalisation and the promotion of Fundamental British Values". They argue that 'British values' is a contested term and here we draw on the recent Reflecting Realities[1] report (CLPE, 2020, p. 17) to consider how stories can be used to avoid "paint [ing] the collective realities of people with the 'we're all the same' brush [which] diminishes the truth of people's lived experiences". In other words, storybooks can provide recognition and affirmation for readers who can identify, whilst providing invaluable insights into those who may not. Such insights were evident in the student-authored e-book Mateo Meets His New Classmates. Responding to SDG 10 Reduced Inequalities, the student introduced Mateo who is a new pupil in a school (see Figure 6):

> *He does not speak nor understands English very well, and therefore he struggles to make friends…Mateo feels emotionally down and confused and would like to talk to other children, but the language barrier prevents Mateo from starting a conversation with them.'* (Student comment from rationale)

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[1] The Reflecting Realities report (CLPE, 2020) was a survey of ethnic representations within UK literature.
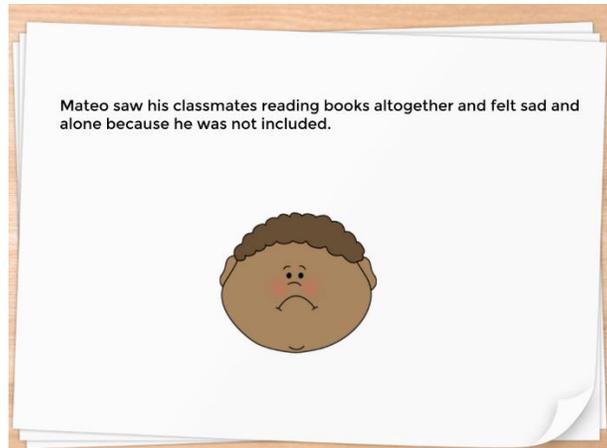
Figure 6: Illustration from Student e-book Mateo Meets His New Classmates

Recognition of the value of Mateo's home language in the story could exemplify Friere's interpretation of critical theory (Quintero, 2017) and critical pedagogy to enable change in thinking around the value attributed to languages other than English. Quintero (2017, p. 166) asserts that she often "encounters scepticism about the possibility of Freire's lofty, intellectual and activist ideas relating to young children". However, her work with students in Higher Education explores Friere's 'reading the world and reading the word' (Gruenewald, 2003) at the heart of literacy learning, with literacy seen as valuing children as active participants in culture and cultural production (Kuttner, 2015). In addition, Mardell and Kucirkova (2017, p. 173) draw on research by González, Moll and Amanti (2006) and the idea of celebrating 'funds of knowledge' which acknowledges the diversity of practices within families and how they negotiate the cultural-historical contexts of literacy learning. Here the student-author of Mateo Meets His Classmates could have celebrated her own Spanish heritage and increased Mateo's agency by using her home language within the story.

The *Reflecting Realities Report* (CLPE, 2020) documented it was often difficult to locate and recognise ethnic minority presence in the texts reviewed. In equal measure, Beneke and Cheatham (2019, p. 121) argue that teachers were often "enacting discourses" in teacher-child interactions, predominantly colour identification, and matching skin tones, rather than having any authentic discussions about race or multiculturalism. Here we draw on a further excerpt from the student-author of Mateo Meets His New Classmates:

> *The identification of the child in the wheelchair and the coloured child, will stimulate questions around disability and diversity.* (Student comment from rationale)

The use of language is important and here we highlight the student's word choice 'coloured' which could be considered offensive / a racial slur. Drawing on the *Reflecting Realities Report* (CLPE, 2020, p. 16) , this could be seen as an opportunity to encourage the less talked about issue of "colourism" noted in a *Guardian* newspaper article (Adegoke, 2019) as "the daughter of racism" by author and actor Lupita Nyong. Whilst it is understood that books can promote interpretation of deficit perspectives, without language to interpret and discuss racial diversity (Beneke & Cheatham, 2019), many readers may internalise inaccurate or racially biased messages (Siraj-Blatchford, 2008). Whilst the student-author of Mateo Meets His New Classmates carefully selected an illustration and named her key character to match his ethnic identity, the student author of Our Journey to School instead produced featureless, simplistic hand-drawn images in a bid to avoid stereotypes (see Figure 7):

Figure 7: Illustration from Student e-book Our Journey to School

In this modern world where stereotypes rage within the media, it is important that the book underlies the idea of inclusion. The book was created to allow children from all backgrounds to be able to relate to either a character or a theme, furthermore, enhancing a child's self-esteem as it links to one of the three pillars for sustainable development, social equality, as they will feel accepted by society. (Student comment from rationale)

The hand-drawn images suggested that inspiration was taken from the distinct features represented in *Gracie's Birthday Party* where the author wanted to 'normalise different representations of children' (Nash, 2019). Further, whilst the *Reflecting Realities Report* (CLPE, 2020, p. 9) quite rightly argues for more ethnic minority presence within children's literature, the intertextuality of the faceless cues could encourage a reading of the story as a positive pedagogical resource to establish a non-judgmental and interactive approach to unlearn prejudice and challenge discrimination. As with the visitors in *Gracie's Birthday Party* (Nash, 2019), there is no need to itemise the characteristics of the visitors, as the illustrations invite children's own interpretations of the story as it unfolds.

Conclusions

We envisage the focus on early childhood education for sustainability within children's literature as integral to a mindful shift towards a more critical praxis with young children, among families, communities and teachers, both pre-service and in-service. This pedagogic study with pre-service early childhood teachers in our university degree programme offered a contextualised reading of the English Early Years Foundation Stage (DfE, 2017) and associated guidance. We purport that, whilst the emphasis on books, stories and reading is commendable (pilot EYFS, DfE, 2018), children's understandings of their world "should not be about 'books read in class' as it is more about experience, conversation and meaningful personal histories" (Early Education, 2018, p. 26), or what we termed pedagogical purpose. We argue, after Quintero (2017), that simply reading to young children about important sustainability topics with no space for communication could be construed as an unforgivable tacit banking concept of knowledge. The banking concept of knowledge positions learners as "empty vessels to be filled with knowledge" (Alam, 2013, p. 27), and has been criticized as damaging the true meanings of learning and inhibiting the creative power of learners.

Our research identifies that children's literature can be a powerful tool through which to communicate important messages related to the SDGs for a sustainable future, and that the process of creating these e-books was an equally powerful tool for educating pre-service early childhood teachers. Our findings indicated the need to avoid catastrophising children's understanding of their worlds, whilst acknowledging their capacities for understanding and talking about sustainability issues from a young age. In creating the e-books, students demonstrated different ways of knowing and came to view early childhood as a key period to foster caring attitudes and empathy towards the natural environment and more broadly learning about inequities, rights and responsibilities. We acknowledge the inevitability of study limitations, for example, whilst the interpretation of data were explored between

researchers, the opportunity to explore directly with the students would have helped to foreground their voices and help us to seek a more holistic understanding of the social and pedagogic phenomena. Extending on this study, further research could include student interpretations through follow-up interviews and a collection of children's responses to the student-authored e-books. This would further extend our understandings of the pedagogical purposes of the e-books, particularly in relation to early childhood education for sustainability.

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Affordances of Small Animals for Young Children:
A Path to Environmental Values of Care

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ABSTRACT

Employing the theoretical framework of ecological psychology, this article uses observations of children in a Danish forest preschool to identify features of the forest that the children engaged with frequently, with a particular focus on affordances of "small animals." The article describes children's fascination and interactions with creatures like insects, worms, snails and frogs, and how activities in varied green settings provide important opportunities for young children to handle small forest creatures, talk about them with other people, and learn to care for them. We discuss how interactions with small creatures may contribute to children's long-term disposition to protect forests and biodiversity, and how to increase opportunities for children to engage with small animals in the everyday settings of their lives. We conclude that these affordances of creatures may prepare young children to understand and support Sustainable Development Goal #15 (SDG #15), which calls to people to protect terrestrial ecosystems and prevent biodiversity loss.

Keywords: Children, small animals, affordances, development, biodiversity

From the perspective of ecological psychology, meaningful action possibilities of environmental features are called "affordances" (Gibson, 1979; Heft, 1988; Lerstrup & Konijnendijk van den Bosch, 2017). The concept of affordances has commonly been applied to environmental opportunities for physical activities such as running, jumping, climbing, and constructing things. Affordances refer to relations between humans and their environment, such as people's relations with physical artefacts, plants, animals, other humans, and features of the landscape (Gibson, 1979).

The observations shared in this article indicate that children in forest preschools are, indeed, drawn to forests' affordances for full bodied movements and the use of materials for creative play and construction; social interactions with other students and teachers; and also engagement with small animals. The latter, however, have not received much attention in the research literature. This study focuses on the significance of small forest creatures for children in Danish outdoor preschools by examining children's interactions with live animals and their residues like bones and feathers. Additionally, the study noted children's interactions with their peers and preschool staff. This investigation was part of a more extensive Danish multi-method study of preschool children in outdoor

environments (Lerstrup & Konijnendijk van den Bosch, 2017; Lerstrup & Møller, 2016; Lerstrup & Refshauge, 2016), with the aim of informing landscape designers who create green settings for preschools.

We begin with a brief introduction to nature preschools and a review of research that examines the influence of these settings on the development of caring for the natural world. Following that overview, we consider studies of the developmental backgrounds of people who feel connected to nature and take action to protect it. We then examine the concept of affordances, especially as it relates to engaging with animate features of the environment, and present the research questions.

Early Life Experiences Associated with Care for the Natural World

Nature preschools began in Denmark in the 1950s, using the forest and other natural surroundings as their classroom (Lerstrup, 2016). By 2015, thousands of nature preschools and forest kindergartens had been established across Scandinavia, Germany, the United Kingdom, Australia, New Zealand, North America, and many Asian countries (Sobel et al., 2016). Despite this long history and these numbers, there are no studies that follow graduates of these schools longitudinally to determine whether they show more care for the natural world than people who attended conventional early childhood programs. Nevertheless, four bodies of research suggest that forest preschool experiences are likely to prepare people for conservation values and behaviors: 1) outcome evaluations of nature preschools; 2) qualitative studies that track children's development in nature-based programs; 3) studies of "significant life experiences" in the lives of people who show active care for the environment; and 4) studies of associations between connecting with nature and environmental knowledge and behavior.

The first body of research includes a number of studies that compare student outcomes, such as readiness for primary school, among those who experienced nature preschools versus conventional preschools with built playgrounds and limited time outdoors. They show that children in nature preschools perform at least as well, and most often better, on measures of motor skills, curiosity, creativity, problem-solving, initiative, self-regulation, and peer relations (Burgess & Ernst, 2020; Ernst & Burcak, 2019; Lerstrup, 2016; Müller et al., 2017; Wojciehowski & Ernst, 2018; Zamzow & Ernst, 2020). Fewer studies measure environmental awareness, ecological knowledge, or care for nature in contrasting preschool settings.

Two studies, however, demonstrate that children in nature preschools or preschools that frequently take children out in nature are more likely to express connection with nature and care for other living things than children in conventional programs. This was the outcome when Giusti et al., (2014) used an "affiliation with the biosphere" interview to compare similar groups of five-year-olds in nature-rich versus nature-deficit preschools in Stockholm, Sweden. Additionally, Elliot et al., (2014) used a "relatedness to nature" interview to compare children in a forest kindergarten with a conventional kindergarten in the same school in British Columbia, Canada. Similarly, when five-year-olds in a preschool in Mersin, Turkey were given four weeks of activities and free play in natural areas, their scores on a "biophilia interview" rose significantly (Yilmaz et al., 2020). The study that compared forest kindergarten and conventional kindergarten students in British Columbia found no differences, however, in environmental behaviors (Elliot et al., 2014); and a similar comparison of new classes in the same school found no differences in either relatedness to nature or environmental behavior (Müller et al., 2017). The researchers suggested that this lack of differences reflected a ceiling effect in a province generally characterized by high levels of pro-environmental values and behaviors.

The second body of research includes qualitative studies that observe children's development in nature-based preschool programs over time. These studies lack comparison groups, but they show how children express curiosity and care for wild creatures and the places where they live. Four ethnographic studies of this kind show children eagerly learning about their environment and its creatures through direct exploration and inquiry, as well as learning from each other and program staff (Elliot et al., 2014; Kharod & Arreguin-Anderson, 2018; Jørgensen, 2016; McClain & Vandermaas-Peeler, 2016). In each study, children demonstrated concern and care for wild animals; or over time they were able to overcome initial aversion to insects or small creatures like slugs and snails and show fascination and even care. Observing one- to six-year-olds in Norwegian preschools on a small island and in a forest, Jørgensen

(2016) noted that animals that caught children's interest were mainly small creatures that they could observe closely and explore "literally hands-on" (p. 1145).

The third body of research takes up the concept of "significant life experiences" that produce "an active and informed citizenry" who work to maintain "a varied, beautiful, and resource-rich planet" (Tanner, 1980, p. 20). These investigations involved diverse samples and multiple methods: retrospective interviews and analyses of autobiographies of people whose lives express committed action to protect the environment; interviews and surveys that compare people with high and low levels of pro-environmental action; and a few longitudinal studies. (See reviews by Chawla, 1998; Chawla & Derr, 2012; D'Amore & Chawla, 2020; Sward & Marcinkowski, 2001; Wells & Lekies, 2012). The most frequently mentioned formative experiences are extended time in nature beginning in childhood; role models of care for nature in the form of family members and teachers; participating in environmental organizations; witnessing the destruction of wild habitats; and nature books and films. The most common experience associated with valuing and caring for nature is sheer time spent in natural areas in childhood and youth (Chawla & Derr, 2012; Wells and Lekies, 2012). This outcome was evident again in a longitudinal study that took measures of 118 young people in rural upstate New York at ages 6 and 18 (Evans, et al., 2018). When the children were 6, the researchers surveyed their mothers about their child's outdoor play habits, as well as the mother's level of education, values, and environmental attitudes and behaviors. When the youth reached 18, they gave self-reports about their environmental behaviors and attitudes. Spending more time playing outdoors in their rural region at age 6 was the strongest predictor of pro-environmental responses at age 18.

The fourth body of research, on connection to nature, includes measures of nature connection for two- through five-year-olds, which emphasize enjoying nature, interest in it, wanting to play in nature, and expressing care for nature (Beery et al, 2020; Chawla, 2020). Experiences associated with high levels of nature connection in childhood include, most prominently, easy access and extended time spent outdoors in nature as well as adults who promote children's engagement with nature and empathy for living things (Chawla, 2020). Both children and adults who report high levels of nature connection are more likely to report that they are taking action to protect the natural world (Chawla, 2020).

All four forms of research reviewed here—outcome evaluations of nature preschools, observations of children in nature-based programs, significant life experiences of people who actively care for the natural world, and childhood connection to nature—suggest that when children spend extended time outdoors in forest preschools and see their classmates and teachers exemplify respect for forest creatures, they will develop a disposition of care for nature. This conclusion is consistent with ideas developed by Jørgensen (2016), Beery and Jørgensen (2018), and Myers and Saunders (2002) based on their studies of children in nature and children with animals.

Observing young children in island and forest preschools in Norway, Jørgensen (2016) concluded that children in these settings were developing an "ecological consciousness" that is "a matter of multi-sensory openness toward the landscape and the otherness of other living organisms, including the places where these organisms live" (p. 1142). Beery and Jørgensen (2018) claimed that this kind of interactive, multisensory experience during childhood nature exploration promotes biodiversity understanding. They argued that it is "a point of departure for the development of ecological ideas and embodied environmental understanding," making ideas like "biodiversity" personally relevant (p. 21).

Myers and Saunders (2002) proposed that when children learn to know and care for individual animals, they become prepared to care for the habitats these animals inhabit, and with time, whole species and ecosystems. From the earliest months of life, they noted, infants are attracted to animals and quickly learn to read them as social others, given their animacy, bodily coherence, and in the case of higher animals, communication of emotions and potential for interactive relationships. This attentiveness to animals includes noticing their habits and needs. Consistent with the idea of expanding boundaries of care, when Myers and Saunders (2002) conducted focus groups with children aged 6-12 about their animal experiences and interest in helping animals, they found that by the ages of 8-10, children extended feelings of care for individual animals to generalized care for the habitats that their species rely on for survival.

Affordances and Animate Life

The theoretical framework adopted in this study is the ecological psychology of James Gibson (1979), and in particular his concept of affordances. Affordances are possibilities for action in the environment, or in the words of Lerstrup and Konijnendijk van den Bosch (2017), "the meaningful action possibilities of the environment" (p. 49). In contrast to the long-standing tradition among psychologists and philosophers to conceptualize the individual perceiver as a spectator who passively stands at a remove from the world, Gibson aligned himself with those, such as Darwin, who adopt an active, purposive approach to organisms, including humans, in dynamic interactions with their habitats (Heft, 2001; 2010; 2013).

Darwin demonstrated that there is continuity, as well as differences, across species, and that there are some basic functions nearly all species share. Prominent among these is animacy. Living things move around their niches exploring, seeking out resources, avoiding hazards, and sometimes altering them in ways to promote their patterns of living (Odling-Smee, et al., 2003). What they experience foremost are the affordances of the environment.

In an examination of observational studies of the activities of children in their nearby environments, Heft (1988) found that the affordances the children engaged in could be organized into a number of categories, such as graspable objects, surfaces for walking and running, barriers for hiding, and structures for climbing. In these observational studies, attention was mostly limited to children's activities in relation to inanimate features, with the exception of their interaction with other persons. Engagement with nonhuman animate organisms, if it occurred, was not reported. As a result, what has been omitted thus far in studies of children's activities in environments are affordances stemming *from* nonhuman animate organisms.

What perceptually distinguishes animate versus inanimate features? The first difference is that animate organisms generate their own movement. They crawl, tumble, wriggle, run, burrow, fly. Second, and perhaps more critical for the children described in this study, they move in relation to the actions of other animate beings, such as the child's own actions. In those cases, other animals afford reciprocal engagement. When children engage with animate things, the prospect exists for the animate thing to respond to children's actions in turn, creating dialogical possibilities—the affordance of reciprocal, ongoing exchange.

These considerations bring us to the core issue examined here: whether opportunities to engage with animate creatures, particularly in the company of preschool peers and teachers, can promote the development of care toward the natural world. Although people can exhibit caring for inanimate features of the environment like rocks or rivers, perhaps engagement with individual living creatures establishes a foundation for caring for the environment broadly as well as the ecosystems where creatures live. With this possibility in mind, we examined the collected data about interactions of young children with small creatures in their forest preschool environment by asking the following questions:

1. What kind of activities do preschool children perform with small creatures?
2. What do preschool children appear to gain from their acquaintance with these creatures?
3. What are the ethos and practices of the outdoor preschool staff with regard to the treatment of wild creatures?

In the discussion, we consider how the practices in relation to small creatures in Danish outdoor preschools may influence the children's long-term disposition to protect forests and biodiversity.

METHODS AND ANALYSIS

The material reported here is drawn from three sub-studies of a broader project conducted by the first author. The main goal of the project was to study the affordances of natural areas that attract preschool children's attention and activity. In the process, it became evident that small wild creatures constitute important affordances that have been largely neglected by previous research. Therefore, for this article, all three sub-studies were reviewed to extract and

re-examine observations and statements related to "small creatures" as a newly identified class of affordances that deserves research attention.

Sub-study 1. Observations of a Danish forest preschool group during self-directed activities, or free play, at different forest sites. The group consisted of 21 children aged 3-5 and three staff members. At the beginning of each school day, the children moved on foot to different sites in a forest that is owned and cultivated by a foundation. They started out from their base, a house at the city's edge where their parents dropped them off in the morning and picked them up in the afternoon, where they stayed before and after their hours in the forest. The first author accompanied them in the forest on 24 days in all weathers and seasons in 2011, as they spent five or more hours outside each day. Following processes of anthropological fieldwork, the observations were collected in field notes and video recordings (Gulløv & Højlund, 2003). In addition, the staff was interviewed on site.

The preschool leader and staff in the extensively studied forest preschool gave the first author permission to be present during school life for a year, and parents gave signed permission for the use of photos and video clips for research and education.

The fieldwork data from sub-study 1 was analyzed by the first author by viewing and reviewing the videotapes and reading and rereading the field notes, making a qualitative analysis through the theoretical perspective of ecological psychology. The focus of this analysis was the relationship between children's activities and action possibilities of the environment, or "affordances." The analysis was compared with the prior taxonomy of affordance possibilities of outdoor environments for young children Heft (1988). The taxonomy consisted of 10 categories of environmental features, and the most distinctive and attractive activities that each class affords for preschool children. For example, "sloping terrain" affords various action possibilities, but rolling, sliding and clambering up were distinctive for this class, and "loose objects" affords the distinctive activities of arranging, modifying and using objects as tools, props or treasures. Most of the features of the forest environment examined in Lerstrup and & Konijnendijk, (2017) coincided with Heft's taxonomy, but new classes were added. One was creatures, which the children could look for, handle, and care for, which is our focus here.

Sub-study 2. A survey was sent to 353 outdoor preschools in Denmark in 2011, asking quantitative and qualitative questions about preschool organization, goals, funding, staffing and advantages and disadvantages of staying outdoors in green settings. The return rate was 50%. At each school, one staff member was chosen to respond to the survey.

Sub-study 3. One- to two-day visits to 10 outdoor preschools in Denmark in 2012-13. During these visits, the first author made observations and conducted semi-structured interviews with staff, asking about preschool organization, goals, budgeting, and staffing, as well as advantages and disadvantages of operating outdoors.

The findings from all three sub-studies were discussed with forest preschool staff in 2018, when analyses were completed, to verify that conclusions derived from the data were consistent with the staff's experience. In the Results that follow, children's interactions with creatures are described and connected to responses from the staff survey and staff interviews.

<div align="center">

Results

</div>

Results of the three sub-studies described above were integrated in order to offer a coherent overview of the findings. They are presented in the following order: 1. Activities observed; 2. Expressions of attraction, wonder, and awe; 3. Sensory learning; 4. Factual learning; 5. Inspiration for talk and reflection; 6. Respect and care; and 7. Staff ethos and practice.

1. Activities Observed

Activities with animals were grouped under the headings of "exploring," "performing," and "creating." In real life, these three types of activities are often mixed together or rapidly follow each other, yet they remain distinguishable.

These three categories form a useful structure to present an overview of the children's engagement with small animals.

A. Exploring. Exploring included expeditions to look for animals and animal signs and following animal tracks or traces (Figure 1). But also hearing or seeing animals from afar; searching for them under logs and stones and in water, grass, rotten wood and soil; detecting them; and observing them more closely (Figure 2). It also included investigating animal residues, such as bones, feathers, egg shells, snake slough, deer hair, deer and hare scat, owl pellets, and dead animals such as birds, moles, mice, shrew mice, insects, and fallow deer. These discoveries led to many reflections, questions and conversations, and often sent children in search of more knowledge through discussions with peers and staff and consulting natural history books and posters.

Figure 1. *Example of exploring activities: Looking for creatures happens daily. Photo by Inger Lerstrup.*

Figure 2. *Example of exploring activities: A ladybird on a stick is examined closely and reflected over. Photos by Inger Lerstrup.*

B. Performing. Performing **i**ncluded handling animals, catching them, picking them up, placing them, counting them, experimenting, and, subsequently, letting them loose. It included holding animals firmly, but gently (see Figure 3, initial frames), passing animals from hand to hand without damaging them (see Figure 4, latter frames), placing them in observation jars, and feeding them. It often included observing others interacting with animals, and cycles of trying and training until mastering the process of detecting, following, catching and handling a variety of animals. Experiments often included e letting frogs or grasshoppers loose and catching them again, stretching earthworms, observing which snail was the fastest, or letting small creatures sail on bark boats. An important rule for the preschool program was to release animals back into their habitat in due time. This rule was difficult for some children to follow and was often accompanied by the display of strong emotions.

Figure 3. *Example of performing activities (initial frames): A frog is held gently, but sufficiently firmly to prevent it from escaping for a moment. Photos by Inger Lerstrup.*

Figure 4. *Example of performing activities (latter frames): A frog is held by a child and carefully taken over by another child. Photo by Inger Lerstrup.*

C. Creating. Creating included making nests and landscapes for small creatures, arranging and rearranging animal residues, imagining and talking about being animals, and acting out animal roles. All kind of residues were used for the creation of soups, stews, cakes, miniature landscapes, assemblages and pictures (Figure 5). Although groups of children often imagined they were animal families of birds or mice that they observed in the forest, they chose more often to be pets like dogs or cats or powerful animals like lions, tigers, and dinosaurs.

2. Attraction, Wonder and Awe

What children do with animals and animal residues can be observed and recorded, but it is more difficult to pin down what children feel and gain from their acquaintance with small creatures. To cast light on this subject, the staff survey collected from 178 outdoor preschools included the following question: "*What are, in your opinion, the most important reasons to stay outdoors in green settings with the children?*" Staff members often connected activities in green settings with joy, wonder and new discoveries:

> "*Joy of nature at an early age.*"

> "*We feel lots of wonder, while nature is always changing and will constantly offer new experiences as the seasons change, the weather, the plants and the creatures.*"

Figure 5. *Example of creating activities: feathers are gathered for a "play brew." Photo by Inger Lerstrup.*

These statements confirmed observations in the field. Watching children engage with small creatures, the first author noted their attraction, fascination and joy. All of the children showed sins of excitement when they saw or heard any animal or any signs of animals, calling for the other children and the teachers in enthusiastic voices and often jumping with joy. In general, the children were quick to detect changes or new things in their daily environment, and they were most interested in things and places that were different and unique, ones that offered

possibilities for exploration and action. Children appeared to be most attracted to creatures that exhibited agency or ones that elicited the children's own agency. Children treated creatures like treasures, and each interaction appeared to ignite wonder and awe.

Although fascination was apparent, children expressed it in a variety of ways. They often responded to observations of animals with laughter—like the way children often laugh with delight when they run. Some children wanted to hold all kinds of small creatures. Other children were fond of some creatures, such as butterflies and ladybugs, but exhibited expressions of disgust with others, such as snails, earthworms, spiders, and dead mice. A few children wanted initially to smash or crush *any* small creeping creature.

By following a group of children over a year, it was possible to observe how relations with animals evolved over time. Children noticed other children's behaviors and staff reactions. Over time, disgust or fear changed to interest, and later to enthusiasm or at least tolerance. For example, some children found interaction with previously frightening creatures a challenge worth overcoming as the following field note demonstrates:

> *A four-year-old girl came running and shouting triumphantly, "Inger, Inger, I am no longer afraid of spiders!"*
>
> *Inger: "Oh, wow, so you can look at a spider now without screaming?"*
>
> *Girl, smiling broadly and nodding: "Yes!"*
>
> *Inger: "And hold it in your hand?"*
>
> *Girl, shyly: "No. Not yet. But now I can hold the glass with the spider inside."*

Some children looked for small creatures every day all year long, even in winter when they mostly found signs of creatures versus the creatures themselves. Others searched intermittently, especially when they saw signs of an animal they did not already know. According to the field observations and staff confirmations, all children in the program engaged and handled small creatures.

3. Sensory Learning

Learning consists not only of gaining factual knowledge, but also the attunement to sources of sensory experiences. Learning is embodied broadly speaking, and not solely an intellectualized, detached process.

Surveyed preschool teachers mentioned hands-on experiences as an important reason to take learning outdoors:

> *"Tactile sensing (mud, needles, branches, creatures)."*
>
> *"We get lots of first-hand experiences of plants and creatures that we meet, feel, smell and see."*
>
> *"We taste, smell, touch and use the life in the forest to obtain knowledge about animals and plants."*

Field observations showed children in the forest engaged in first-hand multisensory experiences with small creatures rather than adopting the stance of a spectator. In the process, they learned how to handle different kinds of animals, such as spiders, giant centipedes, dung beetles, frogs, ladybugs and woodlice. By the time the children were ready to leave preschool for primary school, most of them had experiences with the feeling of an earthworm, snail slime, frog's legs or beetle feet on their hands. They had also experienced touching bones, feeling and studying bones and bone fragments from different animals, handling and scrutinizing the contents of owl pellets, and smelling the musky trail of a fox and a decomposing dead mole.

4. Factual learning

In the survey, preschool teachers mentioned that children gained knowledge about weather, seasons, vegetation, and creatures of the forest as reasons for learning in green settings:

"Knowledge and experiments around nature and wildlife."

"Knowledge of nature, plants, creatures, following the seasons of the year."

"Knowledge about the shifting seasons, wildlife, etc."

"Knowledge about nature… a rich vocabulary of terms about nature."

"Knowledge about nature, playing on the forest floor, smelling the forest ground, experiencing the animal life of the forest… experiencing how tadpoles become frogs, eating nature…"

According to the field observations, children knew the voices of a number of birds and they knew the names and life cycles of ants, snails, butterflies, frogs, salamanders, birds, and dragonflies. They obtained their knowledge about small creatures from direct experiences and dialog with peers and teachers in the forest. According to staff interviews, children's access to factual knowledge about animals and ecosystems relied primarily on the degree to which peers and staff in different preschools valued this kind of knowledge, sought it out, and passed it on. Sometimes children shared knowledge from their families, but more often, parents stated that when their family was outdoors, their child pointed out natural phenomena that they did not know about themselves.

In addition, in response to the survey question about reasons to learn outdoors in green settings, many teachers spoke about understanding *seasons and life processes:*

"Understanding of nature and the shifting seasons."

"They get a deep knowledge of soil, fire, air and water. They get knowledge about the processes from soil to table."

"We follow the life cycle: small creatures live and die."

"They get knowledge about the connections in nature."

"They get understanding of the wholeness."

Small creatures were valued because they provided direct experiences of animal life cycles and they were a means of learning about ecosystems and natural phenomena like the weather, seasons, life and death. According to the field observations, discussions about creatures were often connected to the seasons. Shiny dung beetles and tadpoles appeared in the spring. Small frogs hopped on land in the summer. Snails were plentiful in the fungi in autumn, and the sounds of goldcrests were heard in the spruces during winter when other birds were silent. The children observed and talked about when specific birds arrived in the spring, when they flew back and forth with grass and sticks in their beaks to make nests, when eggshells were found on the ground, and when flocks of birds flew south in autumn.

Understanding life cycles were also supported by intentionally designed curriculum practices. At the preschool program where practices were followed throughout the school year, for example, frog eggs and butterfly eggs were gathered and brought to the preschool building so children could follow the development from egg to tadpole to frog and from egg to larva to pupa to butterfly.

5. Inspiration for talk and reflection.

In response to the survey question about reasons for learning in green settings, a teacher explained how the combination of time, shared experiences, and animal life, such as an earthworm in action, led to awareness and talk:

"Because it is totally fantastic – to have time for the immersion it takes to lay still on your stomach and observe the earthworm crawling out of its hole, along the soil surface and into another hole, while we talk about worms and are ever so quiet."

In the field observations, finding creatures and signs of creatures fueled reflection and dialog between children and between children and staff members (Figure 6).

Figure 6. *What is this? A child brings a gall to show the others for shared speculations. Photo by Inger Lerstrup.*

Figure 7. *Bones are exhibited and discussed by a group of children. Among the topics were the origin of the bones, to which animal they belonged, where the bones were placed on the animal, and how and why it died. Another topic was what the bones could be used for, such as hammers or magnifying glasses. Photos by Inger Lerstrup.*

Possibilities for dialog were countless. Children discussed with their peers or with staff members how to find, catch and handle small creatures. They speculated on what to do with them, where they lived, how they reproduced and

took care of their offspring, what they ate, where they slept, how and where they survived winter, how they died, what they might think, and more. Sometimes, the children's motive to talk about the creatures seemed to be fueled by the exhibits they made of their treasures and findings of the day (Figure 5).

When the children found dead animals, they invariably discussed life and death, often with references to the death of a dear pet or grandparent. This led to discussions about what happens with dead bodies, human and animal, how things rot and decay, how this may create food for worms and manure for vegetation, and how some creatures die while others will be born and grow.

6. Respect and Care

Many preschool teachers understood that learning in green settings with access to a variety of creatures was a way to build a deep and positive relation between the children, wild creatures, and their habitats. They connected animal experiences to empathy, compassion, solidarity, respect, care, responsibility for the environment, and protection of the environment and all its creatures, including other humans. Many teachers echoed the following survey statements:

> *"They learn to take care of nature, to feel compassion for all life forms."*

> *"Solidarity with nature, we rely on it, and the other way around."*

> *"Respect for and understanding of nature."*

> *"They get a feeling of responsibility for the animals and insects that surround us."*

> *"Nature is a fountain of resources that the children learn to use—they learn to find joy in nature and get respect for nature, each other and living beings."*

> *"Attention to yourself and others, care for small creatures, care for each other."*

Observations in the field showed how children took and interest and cared about the creatures they handled (Figure 8). Children also wanted to help small creatures (fig 9). During extended observations, it was evident that children's developing relationship with forest creatures was a joint venture that involved the setting, their peers, the staff, and preschool culture.

6. Staff Ethos and Practices

The ethos of outdoor preschool staff in relation to animals and ecosystems can be described by the way staff members explained natural phenomena to children and how they taught children to handle small creatures.

A. Staff relations to green settings. In Denmark, there is no common education for staff in outdoor preschool pedagogics and no national organization for outdoor preschools. Despite this lack of national coordination, when the first author visited 10 outdoor preschools for 1-2 days in different parts of Denmark and did extended observations in another, a number of similar practices were evident. The way staff taught children to handle living animals was similar as well as their often-repeated principle that animals were the true inhabitants and owners of the forest. In cases in field observations or interviews were staff heard referring to animals in human terms like "baby snails" or "grandmother birds." Instead, it seemed as if the outdoor preschools chose to support the feeling of 'sameness' by telling how the creatures performed tasks common for all animate beings like what they eat, where they stay summer and winter and how they get offspring. Staff noted animal roles of predator and prey. When children in one of the preschools saw an animal catch its prey, the staff explained that it had small birds in the nest to feed. In another preschool, staff told a tale about the owl and buzzard forgetting their role of keeping the mouse population in the forest at a reasonable level.

Figure 8. *Children have gathered grass to make a nest for a small creature. Photo by Inger Lerstrup.*

Figure 9. *A child is gently helping a dung beetle to turn around from the back. Photo by Inger Lerstrup.*

Sometimes staff differed on whether it was best to answer children's questions about animals with scientific facts or let the children imagine a number of answers. Primarily, staff differed in how they treated death and decay. When a dead bird or mole was found, the children in some preschools would dig a hole, make a burial with songs and speeches, produce a cross of sticks to put on top, and decorate the grave site with flowers, moss and stones. In other preschools, the carcass would be preserved in glycerol, or buried for later digging up and investigation of the bones.

Likewise, explanations about game hunting differed. In many preschools, staff never mentioned hunting or explained it as a necessary wildlife management strategy for deer population. On the other hand, in a preschool located in a farming region, a group of hunters met in the preschool hut for their lunch and later showed the children the dead game that they had killed (Figure 10). They invited the children to touch the animals and even take out the guts of a hare. Several of the oldest children accepted the invitation (Figure 11).

Figure 10. *Hunters exhibit their game of the day and invite the preschool to have a look. Some children needed a staff hand to hold, others wanted to view, touch and smell the game including deer, fox, hare and fowl. Photo by Inger Lerstrup.*

Figure 11. *Some children accepted the invitation to help hold the hare when it was drawn and skinned, others watched with fascination mixed with terror. Photo by Inger Lerstrup.*

B. Staff rules for handling living creatures. Staff sought to teach respectful and caring behavior and skills by example. As staff members remarked:

> *"Our children should be together with adults that treat nature with respect, so that the children get to know how to behave. Apart from this, respect for nature will follow from knowledge and good experiences in nature."*

> *"We have great respect for every living being, and we borrow the creatures while we are in the forest, but we let them free again."*

> *"We have many frogs/reptiles and we try to take care of them by having a specific place, where they can be held/investigated."*

> *"We tell them that noise scares the animals in nature."*

Despite rules that the children were not allowed to ill-treat animals or examine them in ways that led to damage, staff acknowledged that they did not see and control everything:

> *"If children are going to learn how to handle creatures and get first-hand experience, some creatures will die."*

> *"We try to have a sensible approach to children's experiments with creatures – we don't allow frogs to be drowned or snails to be smashed and the like, and protest, when we see it, but we don't see everything!"*

> *"When we examine small creatures with the children, we handle them in an exemplary manner, knowing that secretly they will test how long an earthworm may become when you stretch it. This is the children's universe, and you have to respect it."*

Children were, however, allowed to smack mosquitos, and when a child discovered a tick, it was removed and killed immediately.

In the preschool that was observed across a year, staff members generally had an accepting and caring attitude towards small creatures, and supported the children's interests by supplying them with buckets, magnifying glasses, nets, handbooks and stories. They also shared information about their own engagement, experiences, and knowledge. When children complained about ants, flies, bees, or mosquitos, staff reminded them that the creatures live in the environment. Teachers emphasized that WE are the guests, or that the forest belongs to the animals; essentially, WE are visitors. This was often followed by an invitation to take a closer look at the animals or an offering of a piece of interesting information about a specific species.

C. Preschool culture related to creatures. In the preschool observed over the course of a year, children and staff often chose games and told stories that involved animals. For example, during morning circle time, staff often played singing games about animals, such as, "Come, come, come and watch a bird's nest." During this song, the children pretended to be fledglings in a nest, visited by a mother bird carrying a worm. Subsequently, when the children passed a field with a few gulls, one child joyfully jumped up and down when he saw a gull with something in its beak, exclaiming, "See, see, it is going home to the small birds in the nest!" Each day before the children went home, a staff member told a story. Many of these tales included animals, such as goats, foxes, wolves, bees, hares, or doves. In the tales, the animals often had a helping role. Children often acted out these stories during play time after hearing these tales. According to the staff interviews, staff sometimes dramatized the life stages of an animal over the course of a week, such as ladybugs or dragonflies. These songs, stories and projects seemed to engage the children imaginatively in animals' lives.

Discussion

This article considers whether experiences in early childhood in outdoor preschools can be relevant to SDG #15, which calls on people to protect terrestrial ecosystems, including sustainably managing forests and preserving biodiversity. With SDG#15 in mind, we focused on findings from a study of children in Danish outdoor preschools, closely observing the children's interactions with small forest creatures and visiting, interviewing and surveying outdoor preschool staff. Furthermore, we considered the relationships with animals that preschool staff encouraged by living and learning in this setting where they were taught that wild animals were the forest's true inhabitants and owners and people were visitors. Using the concept of affordances, or "the meaningful action possibilities of the environment" (Lerstrup & Konijnendijk van den Bosch, 2017), our analysis indicates that the affordances of small creatures for preschool children are many and varied, and appear to prepare children to value forest ecosystems as a "home" that diverse forms of animal life require.

Like children described in other preschool settings with wildlife (Elliot et al., 2014; Jørgensen, 2016; Kharod & Arreguin-Anderson, 2018), children in the forest were fascinated by living beings and became experienced in finding and handling small creatures. Through these hands-on experiences, they became acquainted with the look, feel, smell, and sound of a variety of beings. The creatures roused curiosity, and seemed to foster empathy and care, if not immediately, then with growing familiarity. Living beings afforded opportunities for discussions and reflections about the life habits and habitats of different species, life cycles, predator-prey relationships, decay and decomposition, and seasonal changes. At the same time, the children were learning how everything fits together within the forest ecosystem. These are basic ecological principles; but for these children, they were not abstract ideas, but sensuous, embodied knowledge gained during free play and exploration. This kind of knowledge fits the descriptions of an "ecological consciousness" and "embodied environmental understanding" presented by Jørgensen (2016) and Beery and Jørgensen (2018). Current literature related to nature preschool outcomes, significant life experiences, and connection to nature suggests that the time the children spent outdoors in nature, in the company of peers and teachers who demonstrated interest and appreciation for diverse living things, will contribute to life-long tendencies to care for the natural world.

In considering SDG #15, it is relevant the children observed were not in wilderness areas where they were taught to look and listen but leave no trace. The preschool observed across the seasons stayed in a well-managed and cultivated forest with other visitors where they were allowed to explore, construct, dig, and create. In general, staff valued the presence of small creatures and both staff and peers served as role models for how to handle small animals with respect. Although the concept of "co-existence" may have been too abstract for this age, the children were learning through their own experience that trees, understory vegetation, wildlife, forest workers, occasional visitors and children can co-exist in green settings.

Strengths, Limitations and Implications for Further Research

The theoretical framework of ecological psychology that this study applied is well suited for investigating experiences in the environment as it emphasizes the agency of living beings as they engage with the environment, identifying affordances. Ecological psychology provides a language for recognizing children as inquirers and explorers in the environment, who develop skills and competencies, further learning and psychological growth as they engage with the environment. Research on children's connection with nature shows that as children develop feelings of competency and comfort in nature, they become more likely to express motivation to protect the natural world (Chawla, 2020).

This study demonstrates the power of extended observations of preschool children's developing relationships with forest creatures supported by data from a survey collected from outdoor preschools and visits and interviews with staff at outdoor preschools. Together, the data provides a deep understanding of affordances of creatures for preschoolers.

At the same time, the fact that this study was confined to Danish outdoor preschools is a limitation. In order to determine whether young children's relations with wild creatures develop in similar ways in other places and other

types of ecosystems, similar multi-method studies are needed in other countries with different cultural perspectives and practices related to children and nature, and with different geographies that might contain more dangerous animals and outdoor risks.

The study of children's relations with wild animals in outdoor preschools will also benefit from more outcome evaluations that include measures of knowledge about ecological principles and local biodiversity, connection to nature, and motivation to protect wild animals and the places where they live. Longitudinal studies that follow graduates of nature preschools as they move forward in their lives may yield a better understanding of whether their early experiences in nature continue to influence their relations with the environment.

Conclusion

The presence of many diverse creatures in preschool settings enables children to experience a forest's complexity and know its inhabitants. The concept of affordances serves as a useful guide to the design of green settings for children, given its focus on the possibilities for meaningful action that the physical environment provides. This study has shown young children's attraction to animals in their environment and the particular value of small creatures that they can hold, examine closely, and engage with. The most important impact of small creatures in green settings of everyday life may be that they fascinate children, inspire varied activities, give room for curiosity, wonder, and awe, and fuel asking, talking, reflecting, and imagining. The study reveals how young children in Danish outdoor preschools, supported by peers and staff members, become comfortable, competent and caring toward wild creatures. It describes children's embodied learning about life cycles, seasons, the niches that different species inhabit, and other features of ecosystems. It argues that embodied experiences of a variety of animals in a green setting creates a foundation for young children to later understand ideas about biodiversity and ecological processes. This knowledge, connectedness and care they feel for individual animals at an early age may later be extended to whole species and ecosystems and thereby constitute a solid ground for life-long affection and willingness to care for, protect, and restore the varied ecosystems of forests and woodlands and the diverse life they harbor -- in other words, to understand and support UN Sustainable Development Goal #15.

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Canadian nature-based early childhood education and the UN 2030 Agenda for Sustainable Development: A Partial Alignment

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ABSTRACT

In 2015, Canada adopted the UN 2030 agenda for sustainable development and committed to its 17 sustainable development goals aiming to address issues of social, economic and environmental nature (United Nations, n.d.). Although Canada proposed an Indicator Framework with measurable targets to track progress on certain goals, these are still in the initial stage of development and discussion (Government of Canada, 2019). With increased demand for nature-based and outdoor educational programs in North America, exploring how the Sustainable Development Goals (SDG) may or may not align with current educational practices seems prudent. Specifically, we ask: Are the social, economic and environmental issues of concern integrated within outdoor nature-based programming? Could immersive outdoor programs be a viable avenue for helping Canada reach some of the global sustainable development goals? Finally, adopting a critical lens on the SDGs more broadly, are there additional ways in which teaching and learning for sustainability[1] can be implemented within Canadian nature-based programming?

In order to examine these questions, we start by briefly exploring the SDGs and the Canadian proposed targets. Utilizing some of the results of a Pan-Canadian large-scale survey study, we delved into survey questions that examined the diversity of the attendees, perceived benefits of programs, and the ways in which sustainability for education are incorporated within programs (e.g., climate change and environmental issues, conservation and stewardship, and Indigenous rights). Findings from the latter study suggest that outdoor nature-based programs can help address several SDGs and promote the development of children's key competencies that could enable them to engage with issues of sustainability. Yet, we contend that further studies are needed to examine how and to what extent outdoor nature-based programs can help equip future generations with a sustainable ethos.

Keywords: Sustainable development; Education for sustainability; Nature-based education; Early childhood education; Environmental education; Canada

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[1] Throughout this article, we rely on the phrase teaching/learning *for* sustainability to align ourselves with similar scholarship that conceives of the learner as embedded within a connected world and an active change agent within that world versus a focus on education of sustainability which focuses on "children's knowledge *about* the environment or their engagement *in* the environment" (Davis & Elliott, 2014, p. 5).

In 2015, Canada, alongside 192 countries worldwide, adopted the 2030 Agenda for Sustainable Development and expressed its commitment to achieving the United Nation's 17 Sustainable Development Goals (SDGs) (Government of Canada, 2019; United Nations, n.d.). According to UNICEF Canada (2017), the global SDGs are ambitious and designed to "provide lifelong education for all, protect the planet, and promote peaceful and inclusive societies – and they include goals and targets to protect children from violence, combat climate change and reduce inequality" (p. 2). In fact, *education* occupies a central part of the 2030 Agenda for being "both a goal in itself [i.e., SDG4] and a means for attaining all the other SDGs" (UNESCO, 2017, p. 1). As a result, UNESCO (2017) published a guide on education for sustainable development (ESD) for education professionals. ESD is defined as a lifelong learning process that "empowers learners to make informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity" (UNESCO, n.d.a., para. 1). UNESCO (2017) promotes the integration of ESD in both formal and informal education settings and within all levels of education, from preschool to tertiary.

Given the growing interest in nature-based education programs (Murray, 2019), especially with newfound attention to outdoor learning arising from the COVID-19 pandemic (Xing, 2020), an   We posit that the outcomes of this article could inform future research and practice and enrich the discussion within the fields of early childhood education, sustainability, environmental education, social justice, and outdoor education both in the Canadian context and elsewhere.

Early Childhood Education for Sustainability (ECEfS)

Many advocates agree that children, now and in the future, will bear the brunt of an unsustainable world (UNICEF, 2014) and "there is possibly no greater concern impacting on the lives of young children than the state of the environment and the equitable and sustainable use of its resources'' (Elliott & Davis, 2009, p. 66). Like others, we support a view of children as competent and capable of engaging in learning for sustainability (Caiman & Lundegård, 2014; Holbrook, 2009; Gothenburg Environment Centre, 2010). Furthermore, research shows clear evidence of children engaging in learning for sustainability and acting upon that knowledge (e.g., Boyd, 2016; Harwood, 2019; Mackey, 2012). Yet, clear gaps in ECEfS curricula and pedagogies are persistent.

Elliott et al. (2020) noted that multi-level systemic transformations are starting to take place in ECEfS around the world, although there remain significant challenges, such as moving beyond the assumption that playing outside in nature will automatically lead to developing a sustainable worldview (Elliott, 2017). Elliott et al. (2020) highlight that researchers in ECEfS (and we suggest educators as well) need to embrace a radical shift in how children are viewed and in what ways pedagogical approaches are transformed in early childhood education. Arguably, placing too much emphasis on concepts such as children's individual agency, environmental stewardship, and nature play, as well as viewing children as developmentally immature and in need of protection from the complex problems of the world (such as, climate change) is limiting and problematic. In fact, we, alongside Ärlemalm-Hagsér and Elliott (2020) and Engdahl, (2015), acknowledge that children are competent and capable of understanding and participating in complex issues affecting their lives; a stance that better supports the educational goal of helping deconstruct and transform a worldview deeply entrenched in anthropocentrism.

Canada and the SDGs

Since 2015 when Canada agreed to the goals set out in the 2030 Agenda, the federal government has moved forward on implementation through a public consultation process and an SDG funding program. Public consultations were held in 2019 and the results were published in an interim document titled, *Towards Canada's 2030 Agenda National Strategy*. This document contains a set of proposed measurable targets to demonstrate where Canada would like to be in 2030 and presents a draft version of the Canadian Indicator Framework (Government of Canada, 2019). In order to further Canada's implementation of the 2030 Agenda, the government of Canada launched an SDG funding program which provides financial support for projects that aim to either raise awareness of the SDGs or focus on research and innovation. To date, 47 organizations have received a total of 4.3 million in the 2019-2020 SDG funding (Employment and Social Development Canada, 2020).

On a related note, the 14th edition of UNICEF's Office of Research Report Card, *Building the future: Children and the Sustainable Development Goals in rich countries,* was published in 2017. This report examined the children's well-being with regard to the SD goals across 41 rich countries. More specifically, it "ranks countries based on their performance and details the challenges and opportunities that rich countries face in achieving interdependent global commitments for children, shared economic prosperity and a sustainable environment" (UNICEF Canada, n.d., para. 1). A companion report was published to highlight how Canada compares to the other countries. Overall, Canada ranked 25th out of the 41 rich nations. The country performed well in some areas (e.g., ranking 6th on SDG 12: Ensure sustainable production and consumption) but drastically low in others (e.g., ranking 37th on SDG 16: Promote peaceful and inclusive societies) (UNICEF Canada, n.d). At the time of writing, the Canadian government had not yet had a published plan on how to achieve the SDGs, despite 2030 being now less than a decade away.

Methodology

In order to examine the connections between outdoor nature-based early learning in Canada and the sustainable development goals (SDGs), we revisit results from a national survey study conducted in 2019. Survey participants consisted of 200 educators working in 165 various outdoor nature-based programs across Canada. Please, see Harwood et al. (2020) to gain a better understanding of the study and its outcomes.

For the purpose of this paper, we focus on a set of survey questions that are relevant to our queries: 1) Does education for sustainability represent a part of the contemporary outdoor nature-based programming in Canada? 2) Could immersive outdoor programs be a viable avenue for helping Canada to reach some of the SDGs? Descriptive statistics were conducted to analyze the closed-ended questions and a thematic analysis was completed for the open-ended questions. Within the scope of this article, we focus on discussing the children's mental and physical health, cultural diversity, inclusion of children with special needs, teaching for sustainability and the development of key ESD competencies.

Mental and physical health

Health and well-being across the spectrum of life stages is the focus of the UN Sustainable Development Goal 3. Canada has scored 29th out of 41 rich countries in terms of "Unhealthy Weight" with 1 out 4 Canadian children is being reported as overweight (UNICEF Canada, 2017). Although many factors can contribute to this unhealthy weight, one potential cause is the increasingly prevalent sedentary lifestyles. For instance, ParticipACTION[2] (2020) has reported that "only 39% of children and youth meet the physical activity recommendation within the Canadian 24-Hour Movement Guidelines" (p. 38). In contrast, outdoor nature-based programs may contribute to children's healthy behaviours, physical and mental health. In fact, there is a growing body of literature suggesting that outdoor nature-based programs can help promote the children's mental health and emotional well-being (e.g., Marchant et al., 2019, McCree et al., 2018; Roe & Aspinall, 2011) and provide the children with opportunities to become more active (Fjørtoft, 2004, Harwood, et al., 2017; Marchant et al., 2019; O'Brien & Murray, 2007). In our survey study, we asked respondents to report activities that children typically experienced within the program, including hiking for short and long distances, risky and/or adventurous play, storytelling, and dramatic play (see Figure 1).

What is evident from the survey responses is that a broad range of activities occur within these types of programs. For instance, over 85% of respondents communicated that children in their programs engaged in exploratory play, risky play such as climbing trees, play with loose parts, construction play, short hikes, creative play, and/or practical skills; activities that entail moderate to vigorous physical movements and generally promote gross and fine motor skills. Interestingly, only 22 respondents out of 164 reported digital technology as a form of their programs' activities, suggesting that nature-based programs are not typically contributing to children's screen time which is often associated with more sedentary behaviours. Survey participants also listed several other activities in addition to the

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[2] ParticipAction is a Canadian organization that has advocated for and monitored the physical health of Canadians since the 1970s

proposed list above, including Indigenous teachings (*n=4*), tool use (*n=4*), and various aspects of socio-emotional learning such as relaxation, empathy, mindfulness, conflict resolution (*n=6*).
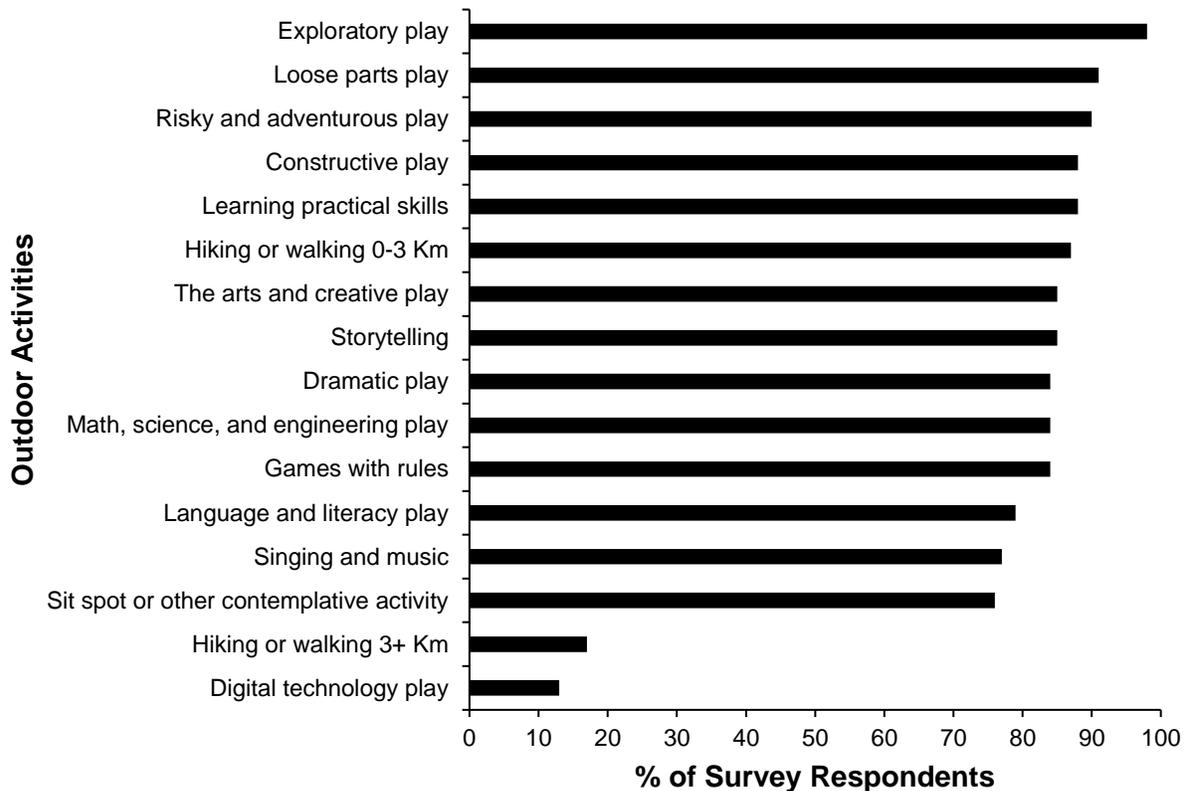

Figure 1. *Occurrence of Activities Conducted at Nature-based Early Learning Programs*

Cultural Diversity

Embedded in the 2030 UN agenda is a strong emphasis on the importance of cultural diversity. Item 36 of the agenda reads:

> We pledge to foster inter-cultural understanding, tolerance, mutual respect and an ethic of global citizenship and shared responsibility. We acknowledge the natural and cultural diversity of the world and recognize that all cultures and civilizations can contribute to, and are crucial enablers of, sustainable development. (United Nations, n.d., #36)

Canada is a culturally diverse country, with immigrants representing over 20% of the population, the highest among G8 nations (Evans, 2013). Statistics Canada (2017a) projects that immigration will continue to increase and may represent "between 24.5% and 30.0% of Canada's population in 2036" (para. 5). Statistics Canada (2017b) also notes that the Aboriginal population has grown by 42.5% since 2006 and will continue to grow at a faster rate than the non-Aboriginal population in Canada. Canada, however, is not immune to racism and discrimination. An Ipsos opinion poll conducted in 2020 demonstrated that nearly three in 10 Canadians report being the victim of racism, an increase from 2019 (Bricker, 2020). Additionally, The Canadian Human Rights Commissions (2020) stated that "it is time for all Canadians to acknowledge that anti-Black racism is pervasive in Canada. In fact, the belief that there is little to no racism in Canada is in itself a barrier to addressing it" (para. 1).

In the United States, the "back to nature" movement has largely been driven by a white, middle-class ideal (Dickinson, 2013). Finney (2014) critiques the absence of African American voices from mainstream environmental narratives, noting that racism has systematically limited black participation in outdoor recreational activities and in matters of environmental concern throughout history. This is exemplified in the recent NAAEE (2017) survey reporting that children of African American and latino/hispanic backgrounds were underrepresented in nature-based programs in the USA. In Canada, MacEachren (2018) also noted the schism between aspects of nature-based education and Indigenous educational approaches. Indeed, several Canadian scholars have called for greater inclusion of Indigenous perspectives and decolonizing approaches within nature-based early learning (e.g., MacEachren, 2018; Nxumalo, 2019; Pacini-Ketchabaw, 2013, Pacini-Ketchabaw, & Taylor, 2015).

In order to examine cultural diversity within nature-based early learning programs, we asked survey participants to report an approximate number of children/families/participants that could be identified with certain ethnic groups based on the Government of Canada's list of ethnicities (Statistics Canada, 2013). For each ethnic origin listed, participants had the choice to select one of the following options: "none", "0-10", "10-20", "20-30", "30-40", "over 50", and "not sure". These numbers were based on the enrolment in their nature-based programs between September 2018 and August 2019. Although results showed a diversity of ethnic groups represented, there was a discrepancy when it comes to their numbers (see Table 1).

Table 1

Prevalence of Different Ethnic Backgrounds as Reported by Nature-based Programs Educators

Ethnic group	% of survey respondents that reported serving this ethnic group	# of survey respondents that reported serving at least 50 participants of this ethnic group
White	98	39
South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.)	72	2
Chinese	74	3
Black	67	1
Filipino	44	1
Latin American	59	0
Arab	50	1
Southeast Asian (e.g., Cambodian, Laotian, Thai, etc.)	42	0
West Asian (e.g., Iranian, Afghan, etc.)	47	1
Korean	41	0
Japanese	44	0

Note: Indigenous ethnicities were not included in the list of options given the limitation that stemmed from the university ethic review process requiring the removal of any question pertaining to Indigenous populations.

For instance, almost all survey participants (98%) reported that their programs included white children/families/participants and that this number was much lower for other ethnicities. For instance, 74% of participants communicated that they had individuals from Chinese background in their programs while only 42% respondents reported having individuals from South Asian backgrounds. Few ethnicities were reported in the highest category. Conversely, a total of 39 respondents reported that "over 50" white children/participants attended their programs during the 2018-2019 year. Also, it was notable that only three participants reported that their programs did not include any white children. These three programs can be described as follows: one program in each of New Brunswick and Ontario reported exclusively catering to Indigenous participants and the third program, located in Quebec, was serving Filipino and Latin American participants. Moreover, although participants were not explicitly

asked to share the number of Indigenous children participating in their programs (a limitation of this study), 32 respondents noted Indigenous participants in the "other" category of the question.

Since many respondents 'skipped' this question or selected "not sure" or commented that they did not keep track of the cultural background of participants, a fulsome understanding of diversity in outdoor programs is currently lacking. Ascertaining a better understanding of cultural representation within programs is important as well as garnering insights into ways of insuring greater representation by addressing any barriers that exist is needed. Interestingly, programs themselves have also noted this gap in receiving requests from a diverse clientele. One survey participant from Quebec wrote:

> Je souhaite dans un avenir proche que mes services attirent une clientèle plus variée. En 3 ans je n'ai reçu aucune demande de la part de famille de minorité ethnique. C'est un triste constat.
> [I hope my services will attract diverse clients in the near future. In three years, I have not had any demand from families of ethnic minorities. This is sad.]

Clearly, ensuring cultural diversity within early childhood programs, including outdoor nature-based programs, proves to be crucial as Canadian population is becoming increasingly diverse.

Inclusivity

Ensuring inclusivity and equality is also a priority of the 2030 Agenda (United Nations, n.d.). More specifically, SDG 10 focuses on reducing inequalities and SDG 16 on building inclusive institutions at all levels. In this section, we concentrate on one particular aspect of inclusivity that connects with our survey of outdoor nature-based early learning: accessibility of programs for children with special needs or attendees who require additional support. The USA-based NAAEE (2017) survey on nature preschools reported having "less than 5% of students that received special education or were dual language learners" (p. 4) compared to 13% of the American education system receiving special education services. Thus, we were curious to explore how Canadian programs would fare with ensuring inclusivity. Survey participants were asked about the percentage of children in their programs who had received special education/services in the last 12 months, the results are summarized in Table 2.

Table 2
Educational Support for Children Enrolled in Nature-based Programs

% of children receiving special education/special needs	% of survey respondents
0	26
Less than 5	41
5 – 10	17
10 – 20	7
20 – 30	5
30 – 40	2
40 – 50	1
Over 50	2

Note: The survey question specified that special education/special needs included children who may have behavioural, communicational, intellectual, physical, or multiple exceptionalities and require supports to fully participate in outdoor and nature-based learning experiences). Numbers were based on the previous 12 months.

Although 17% of the participants did indicate that approximately 5 to 10% of the children attending outdoor programs had received some sort of special educational support for their needs, one might suggest that children with special needs appear to either not be attending the outdoor programs or not receiving the educational support they need. Most often participants reported that none or less than 5% of attendees were provided special education/needs services (26% and 41%, respectively). Participants were not asked to elaborate on this question; thus, we cannot present explanations for these results. However, one survey participant volunteered the following

comment in the final survey question: "I unfortunately cannot take any children with IEPs (individual learning plans) because I am the only adult due to program limitations".

In Canada, it is difficult to obtain national data on special educational services due to the provincially held responsibility for the provision of education, and the more robust data that is reported typically begins with elementary school age children. Further, younger children are often misdiagnosed or go undiagnosed for many years given some of the inherent challenges of diagnosing really young children (Singh et al., 2010). The most recent national reporting on Canadian children with disabilities was conducted in 2006 through the Participation and Activity Limitation Survey (Statistics Canada, 2008). Data showed that 1.7% children aged 0-4 years and 4.2% of children aged 5-9 years were reported as having one or more disabilities (Statistics Canada, 2008). No national statistics have been captured since 2006. This lack of recent reporting is a major issue that has been recently highlighted by a group of Canadian researchers (Shikako-Thomas, 2020). According to recent provincial data for Ontario, an average of 17% of elementary-aged children received special education support within publicly funded schools in 2018 (People for Education, 2018). There is also a steady rise in this percentage since in 2000 only 9% of children received special education support (People for Education, 2018).

Despite our inability to situate our survey data on nature-based early learning within a wider Canadian context, we suggest that children requiring specials needs may not be proportionally included. Given that many of the educational supports provided in Canada may be granted to children through the school system, we drew upon data from an additional survey item that asked participants to select the type of nature-based program (e.g., public or private education from K to grade 6). We found that, out of the survey respondents that reported providing special needs support to at least 5% of children, almost half (47%) worked within the public school system. However, an overwhelming majority of survey participants in this study were not part of a public school system (74%), thus, fewer special education services were presumably being offered in these outdoor nature-based programs. A further examination of the inclusivity policies and available resources for nature-based programs, especially those operating as informal or private programs, would contribute to assessing the potential for outdoor nature-based programs to help Canada meet the inclusivity goals set forth in the SDGs.

Teaching for sustainability

One of the questions included in the survey asked educators about the topics that they introduced, discussed, or explored with children as a part of their outdoor nature-based programs. The participants had the choice to select more than one option from a list of five main topics. Participants could also select "none of the above". Figure 2 depicts the results of this survey question.

As Figure 2 highlights, conservation and stewardship was most often noted by educators as a focused topic within outdoor nature-based programs while climate change and environmental issues was the least frequently reported, although this still represented around one third of participants. Notably, the topic of sustainability was self-reported as being introduced by 80% of the respondents. It would be tempting to conclude that most children in nature-based early learning programs are meaningfully exploring these topics, however, our survey only depicts *self-reported* responses. Limited by the study's design, we are unable to assess to what extent these educators are addressing these topics, their level of comfort in teaching complex sustainability topics, or how they are doing so, especially with very young children.
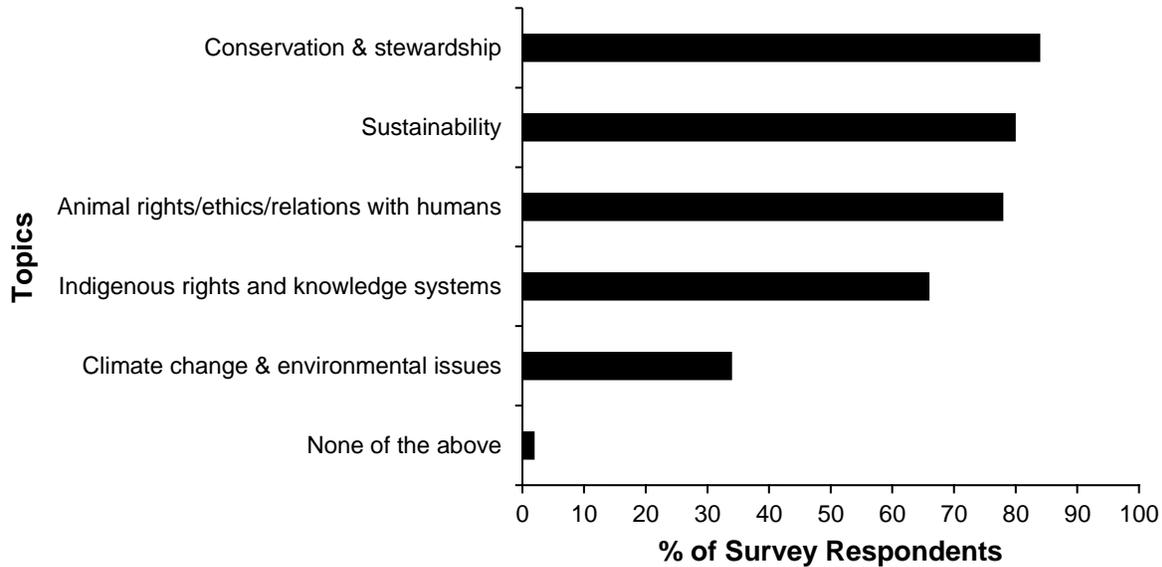
Figure 2. *Topics discussed within nature-based early learning programs*

Note. The list of possible responses included further description in the survey for some items, as follows: conservation and stewardship (e.g., the responsible use, including conservation of natural resources), climate change and environmental issues (e.g., the devastating impact of global warming, such as the more frequent extreme weather events and the sea level rise), sustainability (i.e., respect and care for the community of life, ecological integrity, social and economic justice, democracy, nonviolence and peace, relying on renewable energy), animal rights/ethics/relations with humans, Indigenous rights and knowledge systems, and none of the above.

In order to shed further light on ESD within outdoor nature-based programs, we examined the SDGs themselves. UNESCO has published an online educator resource (https://en.unesco.org/themes/education/sdgs/material) which includes guidelines for each SDG at different educational levels including early childhood. We juxtaposed these guidelines with the main themes found through analyzing the survey question on the perceived benefits of nature-based early learning that were reported by the educators. This survey question asked participants to list two or three of the main benefits they had observed in children who were involved in their outdoor nature-based programs. Open-ended responses were coded inductively then collapsed into themes. Mainly, outdoor and nature programs were suggested to help promote the children's (1) social and collaborative skills, (2) risk taking/management skills, (3) understanding of and empathy/respect to their natural surroundings, (4) connection to the place, (5) mental health and emotional wellbeing, (6) autonomy and independence, (6) creativity, imagination, and curiosity, (7) physical skills, and (8) self-confidence and self-esteem.

In order to determine whether these themes aligned with the SDGs, we conducted a three-way analysis (i.e., UNESCO early childhood guidelines, SDGs, and survey themes). Table 3 highlights the results of this analysis with five of the SDG goals associated with the outdoor nature-based benefits perceived by the study participants. As a result, we propose that educators in general, especially early years educators, can capitalize on outdoor nature-based programs to address the expectations of several SDGs.

Table 3

Aligning the UNESCO SDG ECE Guidelines with the Outdoor Nature-Based Benefits Perceived by Educators in Canada

SDG	Guidelines for educators for addressing each SDG goal at the ECE level (taken from UNESCO, n.d.b.)	Thematic Perceived benefits of outdoor nature-based programs
3 – Good Health and Well-being	Within a context of fun, play, movement and active recreation, learners at this level begin to develop socio-emotional literacy, learning to manage feelings, to build relationships and to understand others' emotions.	Mental health and emotional wellbeing e.g., less stressed, happier, calmer, resilient, and self-regulated. Physical skills including gross, and fine motor skills and stamina Social & collaborative skills encompassing fewer conflicts among children, group work, cooperation, and improved communication with each other.
4 – Quality Education	At this stage, stimulating learning spaces and environments contribute to unleash the learners' potential in creative representation, through drawing, painting, role play or modelling activities. They learn to initiate social relations while making plans and taking decisions, solving problems encountered in play activities, expressing feelings and being sensitive to others	Autonomy and independence (mainly driven by the child-led underpinning principle) Creativity, imagination, & curiosity (mainly driven by the child-led and play-based underpinning principles) Social & collaborative skills encompassing fewer conflicts among children, group work, cooperation, and improved communication with each other.
10 – Reduced Inequalities	At this stage, children learn how to interact and communicate positively with others. Games and role play can be used to introduce the notions of inequality, fairness and sharing, e.g., through the equal or unequal distribution of coins or sweets, thereby increasing the learners' sense of generosity and sharing	Social & collaborative skills encompassing fewer conflicts among children, group work, cooperation, and improved communication with each other.
11 – Sustainable Cities and Communities	By means of field trips and gardening activities, children at this stage learn about natural cycles and systems. They are able to participate in eco-projects under adult supervision, thereby awakening their creativity and problem-solving abilities. At the same time, in a natural way, they learn to show empathy towards other people and their surrounding environment	Understanding of and empathy/respect to their natural surroundings Connection to the place Social & collaborative skills encompassing fewer conflicts among children, group work, cooperation, and improved communication with each other.

| 17 – Partnerships for the Goals | By means of physical activity and diverse play among peers with different abilities, the meaning of partnership is introduced. They sing together, go on walks in partnerships, and play in small groups, thus developing positive social and emotional behaviours. | Mental health and emotional wellbeing, e.g., less stressed, happier, calmer, resilient, and self-regulated.
Physical skills including their gross/fine motor skills and stamina
Social & collaborative skills encompassing fewer conflicts among children, group work, cooperation, and improved communication with each other. |

Key ESD competencies

UNESCO's (2017) publication, *Learning for Sustainable Development: Learning Objectives*, presents a list of cross-cutting "key competencies for sustainability" (p. 10), arguably competencies that develop in the early years and help prepare children to engage in sustainability learning throughout their lifetime. Table 4 lists these competencies and their corresponding description.

Table 4
ESD Competency Definitions

ESD Competency	Definition (Taken from UNESCO, 2017, p.10)
Systems Thinking Competency	The abilities to recognize and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty.
Anticipatory Competency	The abilities to understand and evaluate multiple futures – possible, probable and desirable; to create one's own visions for the future; to apply the precautionary principle; to assess the consequences of actions; and to deal with risks and changes.
Normative Competency	The abilities to understand and reflect on the norms and values that underlie one's actions; and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.
Strategic Competency	The abilities to collectively develop and implement innovative actions that further sustainability at the local level and further afield.
Collaboration Competency	The abilities to learn from others; to understand and respect the needs, perspectives and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership); to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving.
Critical Thinking Competency	The ability to question norms, practices and opinions; to reflect on own one's values, perceptions and actions; and to take a position in the sustainability discourse.
Self-awareness Competency	The ability to reflect on one's own role in the local community and (global) society; to continually evaluate and further motivate one's actions; and to deal with one's feelings and desires.
Integrated Problem-solving Competency	The overarching ability to apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive and

> equitable solution options that promote sustainable development, integrating the above-mentioned competencies.

We drew upon these ESD competencies to conduct a deductive thematic analysis of the open-ended question on the perceived benefits of nature-based programs. This question was addressed by 163 participants. Each response was coded based on the congruence with the definition of the ESD competencies. For instance, one participant perceived the following benefits of outdoor nature-based programs on the children: "Learning risk-taking and risk-assessment [sic]; Working together as a team; Investigating and observing", this response was coded as both anticipatory and collaboration competencies based on the ESD definitions.

In terms of findings, the data analysis revealed that several of the ESD key competencies were promoted within the benefits of nature-based early learning programs narrated by the educators in the Canadian context. Specifically, the competencies of self-awareness, anticipatory, collaboration, systems thinking, and integrated problem-solving were noted in the participants' responses. However, the competencies of strategic thinking, critical thinking, and normative competence were not noted in any of the participants' responses.

Self-awareness competency was the most frequently coded ESD competency. Perhaps this is not surprising given the young ages of many of the children attending outdoor programs (i.e., 77% of the programs catered to ages 3-5 years; Harwood et al., 2020) and the focus on holistic development in early childhood education. Often participants noted a benefit of increased self-regulation in children attending outdoor nature-based programs. Fostering an understanding by learning about the local environment and a heightened alertness or mindfulness of oneself were also frequently noted. One example is shown by the following participant response, which was coded as self-awareness competency:

> *A heightened sense of self-esteem, self-confidence, and self-efficacy. Children who were shy or felt incompetent have changed to become more outgoing, outspoken, and are able to move their bodies in ways they didn't think possible. Children who are higher energy and are potentially hyperactive have shown increased calm, focus, or groundedness. Children who are aggressive and have an abundance of energy have found a more natural equilibrium and are able to channel energy in productive ways, with a decrease in outbursts and an increase in self-control over time.*

Anticipatory competency was also found frequently among the responses. Dealing with and anticipating changes and potential risks commonly occurs within outdoor programs in Canada, notably due to seasonal changes that children experience and the risky play opportunities that are promoted in some approaches (Boileau & Dabaja, 2020; Knight, 2011). Thus, several participants described the benefits of their programs as including risk-taking and risk assessment, as well as learning to deal with uncertain weather. The two following comments are examples of responses that were coded as anticipatory competency:

> *They learn more about who they are. Students learn to deal with the weather, something they can't change. This changes how they look at other issues they experience in the future. They learn that they can make changes in their life to change their future.*

> *After a few sessions, parents are more relaxed about letting their children play and take risks. Children also learn to be more comfortable in the outdoor environment and take more risks and recognize their limits.*

Next, collaboration competency was noted in many of the responses. Again, this is not surprising given that social skills have been found to be an outcome of nature-based early childhood education in previous studies (e.g., Boileau & Dabaja, 2020; Coates & Pimlott-Wilson, 2019; Harris, 2015). Here, survey participants described children experiencing fewer conflicts, cooperating, and developing empathy – instances that fit the description of the collaboration competency. One participant, for example, listed "Empathy, self-regulation, sense of wonder" as the

main benefits observed, while another wrote: "Children get along better. Physical skills, gross and fine motor, are greatly enhanced. Imaginative play is far superior, with less adult interaction."

Systems thinking was found among many of the survey responses. Educators have observed that children develop an awareness of local ecology, and a better appreciation for the intricacies of relationships around them, both human and non-human. One participant noted, among other benefits, that children: "Develop a deep connection to nature and the 'place' we visit over time, becoming stewards of the natural world." Another response mentioned different types of relationships: "Developing responsibility and relationships - with others, educators and self". A third wrote that children gain an "Enhanced appreciation for the outside world" and a "greater understanding of our interconnected relationship with the "wild."

Finally, integrated problem-solving was found to be present in the responses, although less frequently. This code was mainly assigned to responses discussing children's everyday problem-solving abilities. This participant presented many different benefits of their program, including problem-solving:

> *I could list so many benefits of Nature based play and learning. 1. Is the sense of freedom that the children experience when they're outside. They're surrounded by fresh air, sky and everything that nature has to offer- therefore there are no limits to their exploration. 2. Being outside decreases child related depression, anxiety and other health related issues, like obesity & asthma just to name a few. 3. Being outside allows the children the opportunity to use their critical thinking skills when it comes to problem solving, science, geology and even math and literacy (e.g., how can we build a ladder to get up in the tree- how many sticks will it take, how high can we make it). b) Discovering bugs, birds, and other wildlife - for example we have several dear and a groundhog living in the woods, we also have lots of tadpoles & frogs in the shallow brook below. All of these are REAL life - not just in a book or on a screen. we also have a fire pit for campfires and family gatherings in the winter and all year long.*

As previously mentioned, the remaining ESD competency skills were not found within the responses to this survey question. Taking into consideration that survey participants were not specifically asked to report on the ESD competencies, and that some competencies require advanced cognitive skills that children may not have acquire yet, such as reflecting on the "norms and values that underlie one's actions" (UNESCO, 2017, p.10) for normative competency, this seems unsurprising. Our analysis does suggest that outdoor nature-based early learning programs are a potential avenue for helping children develop some of the competencies they need and will need in the future to navigate increasingly complex sustainability issues. Perhaps with specific ESD competency focused questions in future research, more explicit alignments would be evident.

Discussion

In examining various aspects of sustainability and the sustainable development goals within outdoor nature-based early learning education in Canada, several elements merit further discussion. First, outdoor nature-based early learning programs offer alignment with Canadian ambitions related to SDG 3, which include: "Canada adopts healthy behaviours" and "Canadians have healthy and satisfying lives" according to the draft Canadian Indicator Framework (Government of Canada, 2019, p. 40). Along with minimal use of technology and other sedentary type activities, the survey respondents emphasized greater use of more vigorous type activities (e.g., hiking, risky and adventurous type of play). Outdoor nature-based programs have been found to afford certain types of play that uniquely contribute to more vigorous physical activity (Harwood et al., 2017). Clearly, negating the often-sedentary effects of more typical early childhood programs (Kuzik, et al., 2015; Vanderloo et al., 2013; Vanderloo et al., 2015) with expanded and more inclusive outdoor nature-based programs will be an important contribution to SDG 3.

Although not specifically addressed in an SDG, cultural diversity is embedded in the main principles. SDG 10 and 16 also focus on inequalities and inclusivity. Thus, we examined the cultural composition of children attending nature-based programs and accessibility with regards to children with special needs. The preliminary examination of the cultural composition of children attending nature-based programs in this study did indicate that participation in

programs is skewed in favor of white individuals. Among the 34.5 million Canadian population in 2016, South Asians accounted for 5.6% of the total population (i.e., the highest percentage), whereas Black, Arab, and West Asian accounted for 3.5%, 1.5%, 0.8% of the population respectively. In addition, Aboriginal people represented 4.3% of Canada's overall population in 2011 (Statistics Canada, 2016).

Despite this diversity within the general population, outdoor nature-based programs in Canada appear predominantly white-centric (i.e., only 3 programs exclusively served a non-white population while 98% of programs included white attendees). Moreover, in this study several educators also responded that they did not keep track of cultural composition of participants, thus it is impossible to provide a fulsome account of cultural diversity or to compare the cultural composition of programs to the general Canadian population. Yet, the barriers for participation in the outdoors for marginalized groups are well documented and inequities exist (Winter et al., 2020). Moreover, the specific pedagogy of some programs, such as forest schools are based on a Eurocentric child-centered and play-based approach and may appeal to families that seek programs that match their cultural and family values. As Ärlemalm-Hagsér and Elliott (2020) noted, a Western perspective of childhood, early childhood education and care (ECEC), and nature can be problematic. They further suggest that important questions need to be asked, notably "what kind of ECEC is provided, and for whom", noting that "ECEC can be a vital actor in educating for social justice, social responsibility and social inclusion – against racism, prejudice and oppression" (Ärlemalm-Hagsér & Elliott, 2020, p. 8).

In terms of inclusion of children with special education needs, our survey outcomes appear to echo the results found in the USA nature-based preschool survey (NAAEE, 2017). Although the lack of national reporting on children with disabilities and the special education needs meant we could not draw conclusions related to the accessibility of nature-based programs, we believe that our study's outcomes may align with Shikako-Thomas et al. (2020) who noted that, generally in the Canadian context, "participation of children with disabilities in leisure activities, including opportunities for free play, physical activities, play in public parks and playgrounds, outdoor play and structured play activities is restricted in comparison to that of other children" (p. 9). The inclusion of children from various cultural backgrounds and ethnicities, and diverse abilities needs to be further examined in the Canadian context.

It appears from our survey that topics such as conservation, sustainability, Indigenous rights and knowledges, climate change, and animal rights are being interwoven within outdoor nature-based early programs. However, we caution that this outcome was not verified with specific examples or observations. In an increasingly complex and uncertain world, humans need to develop certain skills and capacities to be able to responsibly navigate their world (UNESCO, 2017). Certain competencies "cannot be taught but have to be developed by the learners themselves. They are acquired during action, on the basis of experience and reflection" (UNESCO, 2017, p.10). Beyond educators noting that certain sustainability topics are included within outdoor nature-based programs, our thematic analysis revealed that several of the SDGs (notably, goals 3, 4, 10, 11, 17) are being addressed in the context of nature-based programs and that several of the ESD competencies are being promoted. Given that many nature-based programs emphasize the children's physical activity, problem-solving abilities, social interaction and generally follow children's interests, this is not surprising. Although we see the merits of outdoor nature-based programs in terms of children's health and development, we argue that these types of educational programs may underutilize an important opportunity for more guided learning of sustainability concepts such as local ecological issues, resource conservation, and social justice-equity issues.

We would also argue that educators need to further their knowledge about education for sustainable development (UNESCO, 2017) and specifically in early childhood education for sustainability, both at the pre-service and in-service levels (Elliot et el., 2020). In fact, Weldemarian and Wals (2020) advance that educators play a key role in shifting towards emergent and relational pedagogy. This poses a unique challenge, however, given the lack of Canadian policy and curriculum frameworks that include ESD, an obvious need and critical component in supporting this shift. In this sense, we find Canada mirrors the USA which has taken "baby steps" in moving from a traditional environmental education approach to an education for sustainability approach (Carr & Plevyak, 2020). Although our survey results hint that some Canadian educators are addressing sustainability concepts in nature-based programs, it is not clear how or which specific aspects of sustainability are being addressed. Thus, further examination would be beneficial in this regard.

Conclusion

In this article, we sought to examine the results of a national survey of outdoor nature-based early learning in Canada through the lens of the UN 2030 Agenda for Sustainable Development (United Nations, n.d.). Findings from the study suggest that outdoor nature-based programs can help address several SDGs and promote the development of the children's key competencies needed to engage with issues of sustainability. Whether through an explicit programmatic or pedagogical decision or not, we contend that outdoor nature-based programs are helping Canada address several of the SDGs. Yet, it remains unclear whether, and if so, to what extent these Canadian programs are challenging a 'nature by default' approach and anthropocentric worldview (Elliott & Young, 2016). Clearly, paradigmatic shifts away from reductionist teaching and learning approaches that focus solely 'in' and 'about' the environment are needed. Also, one can wonder whether educators and programs are adequately prepared to guide children in developing the necessary competencies, knowledge, and abilities to engage with issues and find solutions for social, economic and environmental sustainability in the Canadian context. Thus, further studies that examine how and to what extent outdoor nature-based programs can help equip future generations with a sustainable ethos are to be encouraged.

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"Business as usual"? Or transformative and transactive teaching leading towards the Agenda 2030 goals in Swedish Early Childhood Education

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ABSTRACT

In Sweden, the national parliament has adopted objectives to implement the United Nations (UN) *2030 Agenda for Sustainable Development* (UNESCO, 2017). Sweden's objectives are more ambitious and far-reaching in several policy areas than the targets listed in the 2030 Agenda and outlined in the report *Agenda 2030 and Sweden: Challenges and Possibilities for the Earth* (SOU 2019; UNESCO, 2017). In this article, we discuss Swedish early childhood education in relation to these new national objectives. We employ a critical perspective and recognize early childhood education as both a political and educational setting, one where major and minor politics are interconnected and embedded in practice. We discuss these interconnections as a narrative inquiry scrutinizing different transformations and transactions in Swedish early childhood education practice. Our inquiry focus is an early childhood teacher case study narrative of her everyday education for sustainability (EfS) practices and the UN, Sustainable Development Goals (SDGs). The findings revealed everyday pedagogical practices where children's own interests, curiosities and investigations enhanced EfS as integral to transformative and transactive early childhood education. We argue that further action is required to go beyond "business as usual" and embed transformative and transactive teaching for promoting the new national objectives and global objectives as *2030 Agenda.* Such teaching for sustainability builds on pedagogical strategies where both children and teachers are engaged in a collaborative critical inquiry to challenge unsustainable thinking and actions in everyday life.

Keywords: critical theory, early childhood education for sustainability, transformative education, narrative inquiry, UN SDG:s Agenda 2030

In these times, when uncertainty, instability, complexity and rapid change are creating environmental, economic, and social challenges (Lenton et al., 2019), young children are affected by human impacts on Earth (Davis, 2014). Education, from pre-school to higher education, has been recognized as playing a crucial role in the development of life-long engagement for sustainability, now and in the future. We investigated how a teacher at an early childhood education centre co-constructed new knowledge with children while employing the SDGs (UNESCO, 2017) as a tool for creating practice transformations and transactions. This study addresses the need for further knowledge about critical transformative pedagogies with a focus on EfS (Jickling & Sterling, 2017; Jickling, 2017; Kopnina, 2020; Wals et al., 2017) and transactive teaching (Säfström & Östman, 2020) within early childhood education (Davis, 2014; Elliott et al., 2020; O'Gorman, 2020).

Transformation (e.g. structural reconfigurations or system changes to address sustainability challenges in diverse ways) is an imperative of the 2030 Agenda and the SDGs (UNESCO, 2017). It is inherent within the idea of scaling up the work of global transformation towards sustainable futures within planetary boundaries. During the later parts

of *UNESCO's Global Action Programme*, education for sustainable development (ESD) was scaled up (2015–2019) and five priority areas were highlighted: (1) advancing policy; (2) transforming learning environments; (3) building capacities of educators; (4) empowering and mobilizing youth; and, (5) accelerating local-level actions (UNESCO, 2020a). The *UNESCO Roadmap* (UNESCO, 2020b) also points out that each country needs to set its own targets in relation to national circumstances, as well as move beyond goal setting towards achieving concrete results evaluated with a well-defined monitoring process. In response to this, the Swedish Parliament resolved to incorporate the *2030 Agenda* (SOU, 2019) into the national political strategy for enhancing sustainable development work in Sweden.

Critical voices have long been raised from researchers in the fields of environmental and sustainability education (Jickling &Wals, 2008; Kopnina, 2014; Sandell & Öhman, 2013) about normative, ideological, and theoretical tensions in ESD. Firstly, there is a need for critical reflection on the idea of sustainable development and about the contradictions in the SDG rhetoric, where development, economic growth, and consumption are seen as a remedies for change. Kopnina (2020) challenges this, stressing that "it is precisely economic growth and industrial development, with associated population and consumption growth and increasing demands for natural resources that are *the* root causes of environmental unsustainability" (p. 281). Secondly, Jickling and Sterling (2017) warn that there is always a risk of such terms as "education for sustainable development" becoming "empty signifiers" with "pretentions of being salvation narratives" (p. 4) that fail to challenge taken-for-granted knowledges and approaches.

Nevertheless, despite the normative, ideological, and theoretical tensions in the SDGs, there is an urgent need for serious engagement to diminish the adverse effects of human impacts on the Earth (Jickling & Sterling, 2017). One form this could take is to equip children and youth with the critical, ethical, and leadership competencies and knowledges needed to respond to complex and wicked environmental, economic, and social challenges. As Kopnina (2020) stresses, these challenges can encourage "teaching *for* sustainability [...] that emphasizes planetary ethic and degrowth" (p. 280). As Jickling (2017) points out, it is necessary to develop post-sustainability education that is disruptive and transformative. In this article, we share the case study story of a Swedish early childhood education teacher who, together with children aged 3–5 years created transformations and transactions in practice. The story creation involved listening to her EfS experiences, especially her pedagogical practices where the SDGs were a tool for enhancing EfS.

Theoretical underpinnings

As previously mentioned, the concept of sustainability is both ambiguous and normative and comprises important ideological and theoretical tensions (Jickling & Wals, 2008; Sandell & Öhman, 2013). Thus, there is a need to clarify the terms underpinning this study. In Sweden, the term "education for sustainable development" is evident in policy and politics. As stated in a government report, "In Swedish legislation, the term 'sustainable development' is used in two ways: one broader definition encompasses the environmental, social and economic dimensions of sustainable development, while a second, more specific definition, focuses on the environmental dimension" (SOU, 2019, p. 13). We use the terms "education for sustainability" (EfS) and "early childhood education for sustainability" (ECEfS) aligned with a critical perspective. A perspective that relates economic, social and ecological sustainability to issues of environmental sustainability, human equality, and economic and social justice, as well as human interconnectedness to nature and non-human species (Davis, 2009; Fraser, 2009; Jickling, 2017; Kopnina, 2020). As Wals et al. (2017) argue, sustainability education has developed towards a sense of place, enhancing the relationship between humans and non-humans, questioning hegemonic structures and values, and engaging multiple actors with conflicting views. Jickling (2017) proposes the term "post-sustainability", and argues for approaches to education that are disruptive:

> As humans, we have the capacity to feel, empathize, love, and mourn loss ... We need to pay attention … creating educational experiences that are held, felt, and disruptive might just be the basis for learning that is, indeed, transformational. (p. 28)

In this article, policy is understood in both a broader sense, as international policies such as the SDGs (major politics), and a more specific sense, as the implementation of these policies in early childhood education (minor politics), and

how they are constructed in practice as a way of "doing" policy (Dahlberg & Moss, 2005). Pedagogical transformation towards a sustainable future will not happen by default. There is a need for transformation that contests and disrupts unsustainable ways of thinking and doing (Jickling, 2017), and for new ways of action to support this. As Säfström and Östman (2020) point out, there is a need for teaching characterized by transactions and "partaking in the world", where possibilities to contest values as well as generate new values can nurture transformative ways of thinking and doing.

Recent research in early childhood education for sustainability

The research field of Early Childhood Education for Sustainability (ECEfS) has expanded considerably since Davis's (2009) meta-study that essentially instigated the ECEfS research field. Several research overviews have since further developed the field (Bascope et al., 2019; Boldermo & Eriksen Ødegaard, 2019; Davis & Elliott, 2014; Elliott et al., 2020; Green, 2015; Hedefalk et al., 2015; Somerville & Williams, 2015). Some studies have targeted teachers' perceptions of ESD as EfS within early childhood education (Hedefalk et al., 2015; Larsson & Pramling Samuelsson, 2019; Weldemariam & Wals, 2020). Other studies have highlighted children's capabilities and potentials as critical thinkers and agents for sustainability-related change, as well as their competence and capacity to be involved and participate in actions leading toward sustainable futures (Ärlemalm-Hagsér, 2014; Ärlemalm-Hagsér & Davis, 2014; Borg, 2017b; Davis & Elliott, 2014; Hägglund & Johansson, 2014; Phillips et al., 2020). There are also studies focusing on specific aspects of EfS, including social sustainability (Boldeland & Eriksen Ødegaard, 2019; Hammond et al., 2015), economic sustainability (Ärlemalm-Hagsér et al.,2018; Borg, 2017b), and environmental sustainability (Currie & Deschenes, 2016; Elliott & Pugh, 2020; O'Gorman, 2020; Ritchie, 2016; Taylor et al., 2012). Studies on early childhood education and the SDGs are still in their infancy, and although there are several practice examples (Williams, 2020) and organizations (OMEP Resource Bank for Education for Sustainable Development) that present studies on the topic, there is an urgent need for further empirical research (Elliott, Ärlemalm-Hagsér & Davis, 2020).

Education for sustainability: The context of Swedish early childhood education

We envisage Swedish early childhood education centres (preschools) as settings or places where major and minor politics meet and intertwine. As places, they are informed by their specific historical, ideological, and theoretical traditions and methods of working. They also influenced by broader political discourses in society and as contemporary understandings of children, childhood, and children's learning (Dahlberg & Moss, 2005).

Sweden is often perceived as a pioneering country when it comes to multidimensional approaches to sustainability issues. Yet, although a large number of Swedish early childhood education centres currently work with sustainability issues (Ärlemalm-Hagsér, 2013; Borg, 2017b), there is a distinct lack of field studies (Ärlemalm-Hagsér & Hedefalk, 2018; Ärlemalm-Hagsér & Sundberg, 2016). A significant change in the last year regarding early childhood education and sustainability was the revision of the *Swedish National Early Childhood Education Curriculum* (Swedish National Agency for Education, 2018), enforced since July 2019. In this revision, the concept of sustainable development was integrated into the fundamental values espoused in the curriculum. It is stated in the revised curriculum that ECE should "lay the foundation for a growing interest and responsibility among children for active participation in civic life and for sustainable development" (Swedish National Agency for Education, 2018, p. 5). Three new curriculum goals aligned with sustainability were included:

- to promote conditions where children may feel a growing sense of responsibility for and interest in sustainable development and active participation in society;
- to understand how different choices people make in everyday life can contribute to sustainable development; and,
- to understand how their own actions can affect the environment and contribute to sustainable development (Swedish National Agency for Education, 2018, p.13,15).

Another significant change in Swedish society since January 1, 2020 has been the incorporation of the *United Nations Convention on the Rights of the Child* (UNICEF, 1989) into Swedish law. This means the view of children as active

social agents with the right to participate in decision-making about matters relevant now prevails with the support of the Swedish Government. This progress is also reflected in the revised Swedish national preschool curriculum, which emphasises that children are important actors for creating change leading toward a sustainable Swedish (and global) society (Swedish National Agency for Education, 2018). The points outlined above demonstrate how the Swedish political agenda has strongly and very recently addressed EfS in early childhood education. Furthermore, children's agency and participation are highly valued, both for improving EfS pedagogical practices and building sustainable societies.

Narrative inquiry – A case study

Narrative inquiry is a particular type of qualitative inquiry oft described as both a methodology and a method. Clandinin et al. (2016) argue that narrative inquiry is the study of experiences and stories as a way of investigating a specific phenomenon. As a methodology it adopts a particular view of experience – experiences that are constructed in the individual's life world, and are constituted in the social, cultural and institutional narrative of which the individuals are a part. Because the participants tell stories about their experiences, the relationship between the researcher and the research subjects is central. In the study presented here, one of the researchers worked closely together with an early childhood education teacher, in a collaborative dialogic relationship investigating EfS experiences in the early childhood centre, and especially when adopting the SDGs.

According to Chase (2005) narrative inquiry is interdisciplinary and is shaped by the interests and assumptions of the researcher's disciplines. There are different approaches within contemporary narrative inquiry aiming to understand specific phenomena such as:

- *what* the life stories are about;
- *identity work,* comprising what stories are constructed in specific organizational settings;
- *the how's and what's* involving specific aspects of a person's life;
- *narrative ethnography,* which deals with long-term involvement in a culture or community; and,
- *autoethnography,* where researchers turn the analytical lens toward themselves and their interactions with other people or phenomena.

In this study, the critical methodological approach is inspired by narrative bricoleur (Denzin & Lincoln, 2005) weaving together stories by using one early childhood teacher's stories and the educational practices. The methods for collecting the material in a narrative enquiry are manifold (Clandinin et al., 2016). In this study, the materials were collected between 2020 to 2021 and included the researcher's field notes from a visit to the early childhood education centre, informal teacher interviews, photos, and oral and written narratives from the teacher participant. Additionally, e-mail, text messages, telephone calls and online meetings between the researcher and teacher participant were included as informative data. The units of analysis in the research were the collected data, photos, and the oral and written narratives of personal experiences with EfS in the early childhood education centre. More explicitly, we analysed the pedagogical practices that employed the SDGs as a tool. In the narrative, we use the terms "ESD" (education for sustainable development) instead of "EfS" and "preschool" and "preschool teacher" instead of "early childhood education centre" and "early childhood teacher" respectively, as these English words better correspond to the terminology used in Swedish legislation in the Swedish Education Act, 2010:800; Swedish National Agency for Education, 2018).

Ethical research aspects were managed throughout the entire narrative inquiry process (Clandinin et al., 2016) and the teacher participant consented in writing to take part in the study. At the outset, the teacher was informed that both she and her centre would remain anonymous, and that she could terminate her participation at any time – in compliance with The Swedish Research Council (2017) research ethics. Her pseudonym was Hanna and employed throughout the following narrative. One of the researchers collected the data materials, visited the early childhood education centre, and collaborated with the teacher participant. The teacher participant described her everyday practices with EfS and the SDGs orally, in writing, and with photographs. The researcher visited the early childhood education centre, and collected data with genuine interest in the teacher's story. The narrative began to grow, and

from time to time the teacher was invited to further develop what she was talking or writing about to deepen or extend the narrative.

Narratives: Working with SDGS

The overall narrative comprises a number of sub narratives presented as a whole. Initially we present contextual information about the municipality where the preschool teacher was employed. This offers a broader understanding of the places and the specific historical and ideological backgrounds that influence the pedagogies in the municipal preschools, and especially within ESD. Secondly, Hanna's story about ESD and the SDGs is presented as number of sub-narratives supported by pictures, quotes, and written stories about practices.

Understanding municipal contexts

In this municipality, sustainability issues have long played a significant role in governance, decision-making and planning. The local preschools have been supported in their ESD work by various local government and county council decisions and initiatives. In 2015, the municipality opened the first recycling mall in the world as a concrete climate action to promote a deeper understanding of recycling and the use of recycled materials. In 2020, the municipality supported a pilot project, *Using Recycled Material in Preschools – Pedagogical Implications*, in which five preschools participated. This initiative was to develop the preschools' efforts to become more 'climate-smart', one of the goals in the municipality's long-term environmental and climate action plan. Objects and materials originally discarded at the municipal recycling centre, were selected to be re-used in the preschool with children. Before the preschool teachers could collect the materials, the staff at the recycling centre performed an initial culling to ensure the materials were suitable for use in preschools. The project aimed to reduce the preschool purchasing costs, reduce their environmental impacts, and reduce exposure to the toxic chemicals often found in newly manufactured materials. In the project, the preschools reused the discarded materials, and these were given a new life in children's art, construction, play and learning (see Figure 1).

Figure 1: Construction play with recycled materials

Another aspect of the municipality's work with sustainable development was an effort to develop sustainable food systems. Because Swedish preschools offer a full-day program, free meals are provided, and the children eat breakfast, lunch, and afternoon snacks. To increase awareness of sustainable food systems and enhance sustainable food procurement practices, the preschool cooking staff were offered courses about 'climate-smart' food and help with developing menus using local, seasonal, and organic foods.

The latest and current municipality initiative encompasses social sustainability and gender equality objectives. The local board of education has decided that these objectives are to be prioritised from spring 2021 in all municipal preschools and schools. The municipality is also developing a new climate plan, which will extend until 2045. The starting point is the notion that it should be easy to live a climate-smart and fossil-free life in the municipality. The local politicians stress that, with these actions, they are striving to serve as a green role model for other cities in Sweden and around the world.

Preschool teacher Hanna's story

Hanna told us that she trained as a preschool teacher in the late 1980s, but after working for some years in the field, she began to feel dissatisfied with how her work had changed after the economic crisis that hit Swedish municipalities in the 1990s. The preschools had to cut costs by laying off staff and increasing the number of children in the groups. Hanna then made the decision to change profession. She re-trained as an environmental public relations specialist, and worked in this field until early 2001 when she began to long for a return to preschool and work pedagogically with children again.

Back at the preschool, in 2002, she started up the work with sustainably issues together with her colleagues by applying for the preschool award, a Green Flag[1]. Equipped with the knowledge and experience she brought from working as an environmental public relations specialist, Hanna sent a photo and wrote:

> A newspaper clipping from 2008 that draws attention to the fact that we have received the Green Flag award from Keep Sweden Clean only says that we work with the environment ... Then, in 2008, there were only five themes … about the environmental dimension of sustainable development … recycling, water, energy, forestry and lifestyle/health.

The conception of what ESD in preschool education is and can be has broadened in recent years. This is something that Hanna says she has clearly noticed. Previous studies (Ärlemalm-Hagsér & Sundberg, 2016; Davis, 2009; Siraj-Blatchford et al., 2016) show that the most common issues that educators were working with in preschools around the world had to do with the environment and nature. Hanna also stated that the earlier work at the preschool was mainly about ecological sustainability and environmental issues. She says that this has changed in the last year to include broader consideration of all three dimensions of sustainability: ecology and environment; economics; and, society and culture.

> I feel that the work with sustainable development in preschool has changed over time and increasingly includes the three sustainability dimensions. Above all, a change begins to occur in 2020, as preschool principals and staff read and implement the new curriculum for preschool-18y, which entered into force in summer 2019. I increasingly see consciously planned teaching, where preschool teachers and other staff have planned and thought through the lessons in advance … Which of the sustainability aspects should we focus on now, what should the child / children have the opportunity to develop their abilities in, or develop knowledge about, be further challenged by …

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[1] Preschools in Sweden can be awarded two different types of environmental certification. One is Green Flag, awarded by the organization Keep Sweden Clean (Keep Sweden Clean, 2020), and the other is the Preschool for Sustainable Development certification, awarded by The Swedish National Agency for Education (2020). To qualify for the award, the preschool works with different themes decided upon by the Keep Sweden Clean Foundation (Keep Sweden Clean, 2020).

In this excerpt, Hanna highlighted the ongoing changes in the preschool pedagogical practices. The first change concerned a broadening of what objectives were in focus, from environmental education to sustainable development more generally. Other current objectives related to economic, social and cultural issues. The second change was how the new regulations and the use of the concept of sustainable development (Swedish National Agency for Education, 2018) affected pedagogical practices. Earlier research has specified the need for knowledge development, strong governance, and leadership since transformative change does not take place by itself (Davis & Elliott, 2014). In-service training for preschool principals has led to new understandings and further development of sustainability in the daily preschool activities. Hanna also mentioned, in the excerpt below, that the training made a difference to practice and further developed the pedagogical work with the children around sustainability. As discussed previously, ideas about understandings of ESD in the preschool had broadened:

> *Knowledge about sustainable development among those who work in preschool is very important to enable the teaching to be done a good way based on the curriculum, so that the children's meaning-making about sustainable development gets the breadth and depth they are entitled to, and the change over time that leads to a more sustainable society really does occur. Over the years, I have seen much evidence that our work makes a difference for both the individual and society. I feel that, thanks to the wordings in the latest curriculum, we now have all the staff on board, and it is no longer possible for those who are mainly interested in environmental issues or recycling to interpret the sustainable development dimensions in a narrow way. The clarification that all three dimensions are important has meant that discussions and knowledge development are getting underway on a broad front; even those who are more passive are able understand them better when they are taken up for discussion. The more knowledge the staff gets, the more the discussions revolve around education for sustainable development and the preschool as a whole, and the most gratifying thing of all is that there are real discussions about how children gain influence, are able to participate and can really influence things. In addition, many people realize that this includes the work with the social dimension of sustainable development.*

Hanna asserted that all the preschool staff, from the principal to the staff teaching in the classroom and in the preschool kitchen, had further developed their knowledge about sustainable development and ESD, as supported by the national curriculum ESD emphasis (Swedish National Agency for Education, 2018). In addition, there had been further development of understandings and knowledge that generated practices where children had opportunities to exert influence over their own learning and participate in the preschool learning culture and activities.

Davis (2014) advocates for young children's right to take part in and be seen as important stakeholders in the work towards a sustainable world in the present time as well as in the future. She argues children have the ability to contribute ideas, experiences, and creativity. Children are capable of influencing change, both as unique individuals and collectively, as a group. In the *UN Convention on the Rights of the Child* (UNICEF, 1989) as well as in the Swedish preschool curriculum (Swedish National Agency for Education, 2018), democracy and equality are emphasized. Further, the curriculum promotes children's opportunities to understand how democracy works, take part in democratic decision-making leading towards sustainability, take responsibility for their actions, both within the preschool environment and outdoors in nature, and actively participate in society (Swedish National Agency for Education, 2018).

The beginning of the work with the SDGs

Hanna stated that she and her colleagues began working with the SDGs as a tool for ESD around 2016. They were inspired by a nearby nature school that invited municipal preschool staff to in-service training and discussions once or twice a year. The participating preschool staff were those assigned with extra responsibilities for environmental measures (2–3 staff from each preschool). After this, she and her colleagues started talking about the SDGs with the children at the centre. Subsequently, their pedagogical approach began to take shape. Hanna pointed out that it was important to base the SDG work on the children's own experiences, interests, curiosity, and investigations and to focus on the children's everyday life and events in the daily preschool activities. In the classroom, Hanna and her

colleagues created a process wall, where both the children and teachers posted various kinds of documentation related to the SDGs (see Figure 2).
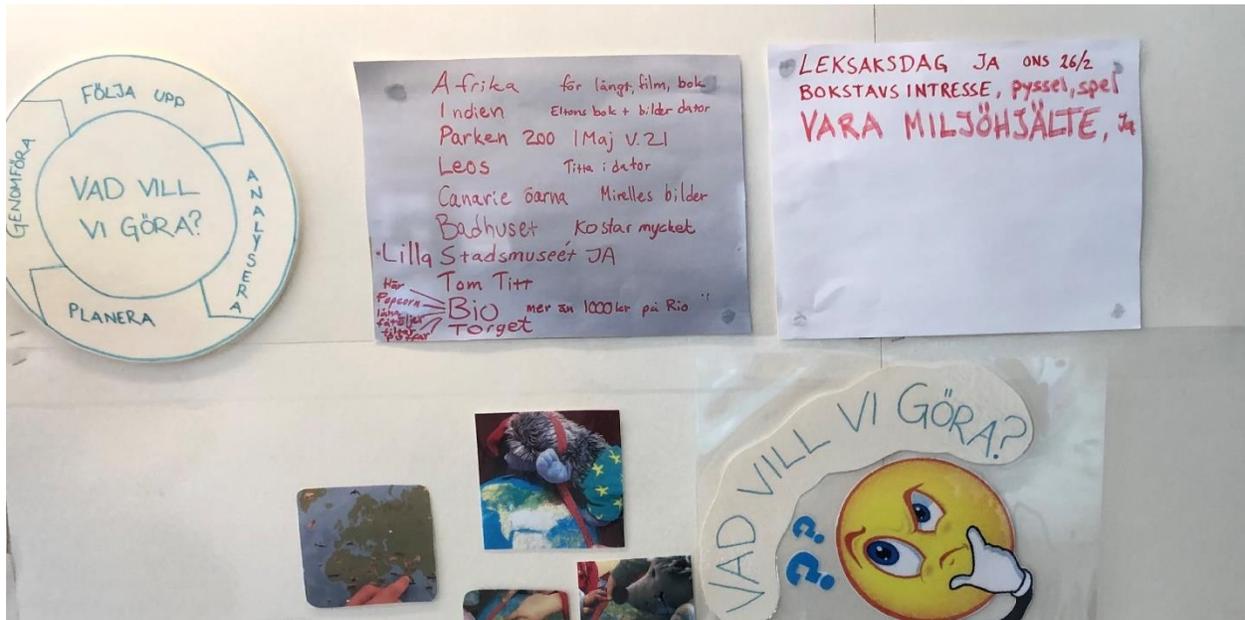
Figure 2: The process wall

The process wall included reminder notes and mind maps on topics and issues occupying the children's thoughts written down as small notes, with texts, photos, drawings, or sometimes even bits of garbage pasted on a piece of paper. Updates on how the various ongoing centre projects were developing were also shared on the process wall. Because the process wall was in a hallway where classroom parents and siblings plus children and teachers from other groups passed by, others were also inspired by the children's curiosity, questions and knowledge. When children and teachers reviewed and communicated about the documentation together, the children had an opportunity to remember and reflect upon their work, thus, potentially influencing their ongoing learning (Doverborg et al., 2020).

Environmental heroes

Hanna stated that every week two children were appointed by the preschool teacher and the children as environmental heroes, an idea that originally came from the children. The children had reminded the teachers that a group of older children previously attending the centre had worn capes with a flash of lightning stitched on them and been appointed as environmental heroes. The children decided that their mission was to promote sustainability, help out with things that the adults had missed or forgotten, and encourage other children and adults to continue working with sustainability in their everyday lives. The children take this task seriously and are proud of it. Moreover, they identify new assignments themselves. These included turning off the lights and water faucets, mending broken things, and checking the recycling bins so that all of the recyclable materials are in the right place. The children overtly looked to the SDGs to identify new ideas for actions as outlined by Hanna below:

> *Our children discuss how to be an environmental hero, pick from among the pictures of the sustainability goals or environmental goals and discuss how recycling, saving water, reusing things can be good for all three dimensions in different ways at the same time, because you do not waste money, you're being kind to others because there will be enough for them also, and at the same time less bad stuff gets into the air …*

The children also spontaneously discussed sustainability issues and questions. For example, they decided that even if two children are the weekly environmental heroes, all the other children can be environmental heroes at the same time. In the excerpt above, the children showed that they could take the lead in developing understandings of sustainability together with new actions and promotional activities (see for example O'Gorman, 2020). The actions mentioned above were linked to SDGs 1 and 2 about sharing so that everyone has enough, to SDG 5 about equality, SDG 12 about responsible consumption, and SDG 15, specifically about minimizing air pollution.

Images of the SDGs stimulate dialogue

Hanna described that, at first, the children were very curious about what the adults had decided when people were talking about the SDGs. Hanna then printed the SDGs, laminated them, and cut them into small cards. The printed SDG cards were stored in small boxes so that both the children and teachers could easily pick them up for discussion prompts. At first, the children looked at the symbols and texts on the cards and discussed what each goal implied, what was written on the cards, and what the images on the cards symbolized (see Figure 3).

Figure 3: Working with SDGs

Then the children wanted to know more about what the images of each goal meant so together, the children and preschool teachers used the internet to find out more. Hanna further indicated that in their pedagogical work with children, such practices involving pictures and images were not new as the teachers believed that these are tools to facilitate dialogue among children and between adults and children. One thing led to another. Therefore, to find out more about the SDGs, they borrowed books from the library, asked parents who had some specialized knowledge, and asked the cooking staff in the preschool kitchen about questions that arose. Hanna stated that when they discussed something the children appeared interested or curious about, it could nearly always be linked back to the SDGs. In addition, the teachers printed the 16 Swedish environmental goals as images, cut them into cards and placed them in a small box to be close at hand when the children discussed various sustainability themes or issues.

Hanna believed that it was important to instigate dialogues on sustainability issues around children's everyday talk and activities. She said that when the children were having lunch, they often raised questions about sustainability. For instance, they had discussions regarding the food they were eating, such as where it came from or how it was transported. These conversations left traces and lasted for a long time for the children, for example:

> *discussing the food's journey from farm to fork, discussing eco-labels in a stimulating shop-play environment, following up further discussions about eco-labels on fish, such as MSC, while sitting at the table eating breakfast or the afternoon snack.*
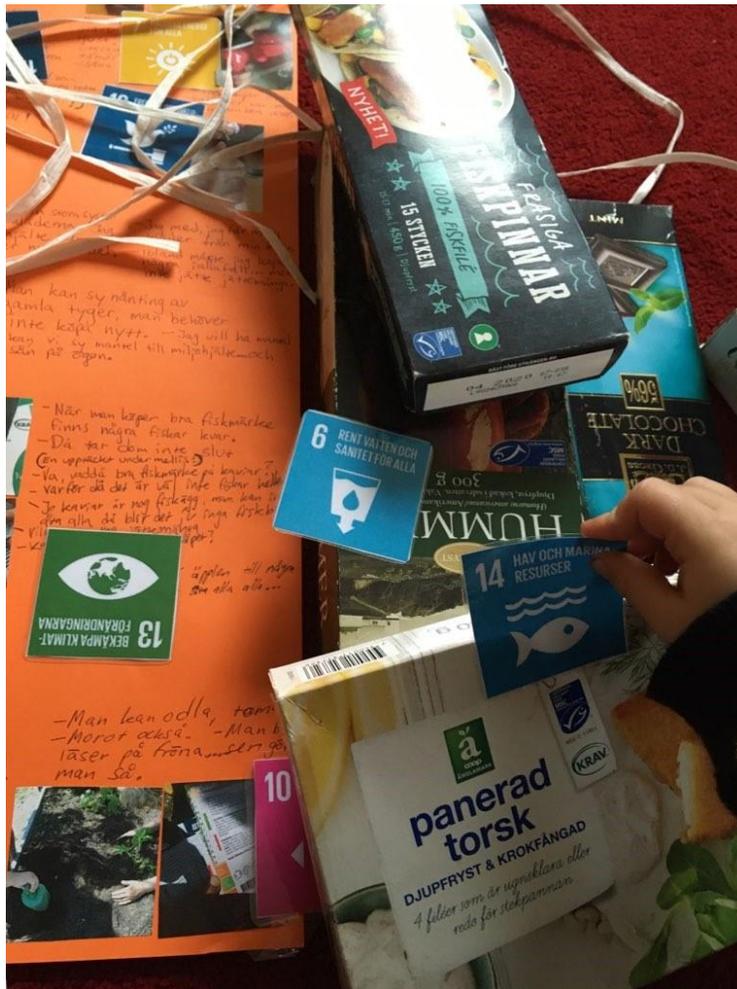
Figure 4: Eco-label on fish packages

Preschool mealtimes created pedagogical opportunities for developing understandings of sustainability issues. Hanna's story about the ecolabel on the fish package suggested SDG 14, Sea and Marine Resources (see Figure 4). This conceptual linkage to the Marine Stewardship Council (MSC) provoked a pedagogical opportunity. The children could develop knowledge about fish and how one can be sure that the fish are caught in a place where fishing is permitted and in a way that is sustainable for fish populations. In the dialogue, the children and the preschool teacher learnt from each other. Hanna argues that one must strike a pedagogic balance between challenging children's understandings and waiting to see what voices are heard and what knowledges can emerge from the discussions among children. Hanna and her colleagues also built a "shop" with groceries in one of the rooms where the children played customer and shop assistant.

Figure 5: Play environment

The children used ecosymbols to label the shop goods (see Figure 5). This led to conversations about SDG 12 Sustainable Consumption in relation to organic food.

Children as agents of change

It was clear from Hanna's stories that the preschool children were important actors and agents in their work with sustainability around change for now and the future and that they can and do make a difference. Hanna shared a story about a climate action instigated by the children that further demonstrated their agency. The children recycled different materials at the preschool. One of the sorting bins was designated for food composting. The children knew that the municipal buses were fuelled by biogas or electricity and that the food scraps they placed in the compost bin were to be transformed into biogas. In their conversations, the children talked about carbon dioxide and its impact on the climate and the greenhouse gas emissions from cars and aircraft. They utilised the SDG cards (7 Sustainable Energy, 12 Sustainable Consumption, and 15 Ecosystems) to keep their discussion going and deepen their understandings.

Hanna described how the children became very upset and sad when they understood that travelling by car and airplane, activities they looked forward to, had climate impacts. Hence, they then reflected on how to avoid such transport and learnt that trees absorb and store carbon dioxide from the air and water:

> In our classroom, we now strive to think in an overarching way, keeping all three dimensions of ESD in mind in everything we do, throughout the child's whole day at preschool. We think it's important to maintain a balance, so that the work is characterized by a positive belief in the future. For example, by noticing a bit of anxiety in some [children] about aircraft exhaust and the desire to travel again after Covid, and then working actively with what can be done, the discussions and knowledge acquisition led, among other things, to tree planting.

They decided to start planting trees, and the children began to collect seeds from different local trees. Their questions led to understandings and knowledge about what trees were best for absorbing and storing carbon dioxide to reduce greenhouse gas emissions. When the preschool principal was planning air travel, the children decided to give her a tree to plant in her garden (see Figure 6). They told her – *You must put it in your garden so that it will grow and get big. Then, it can absorb greenhouse gas emissions, as you are going to travel by airplane*.
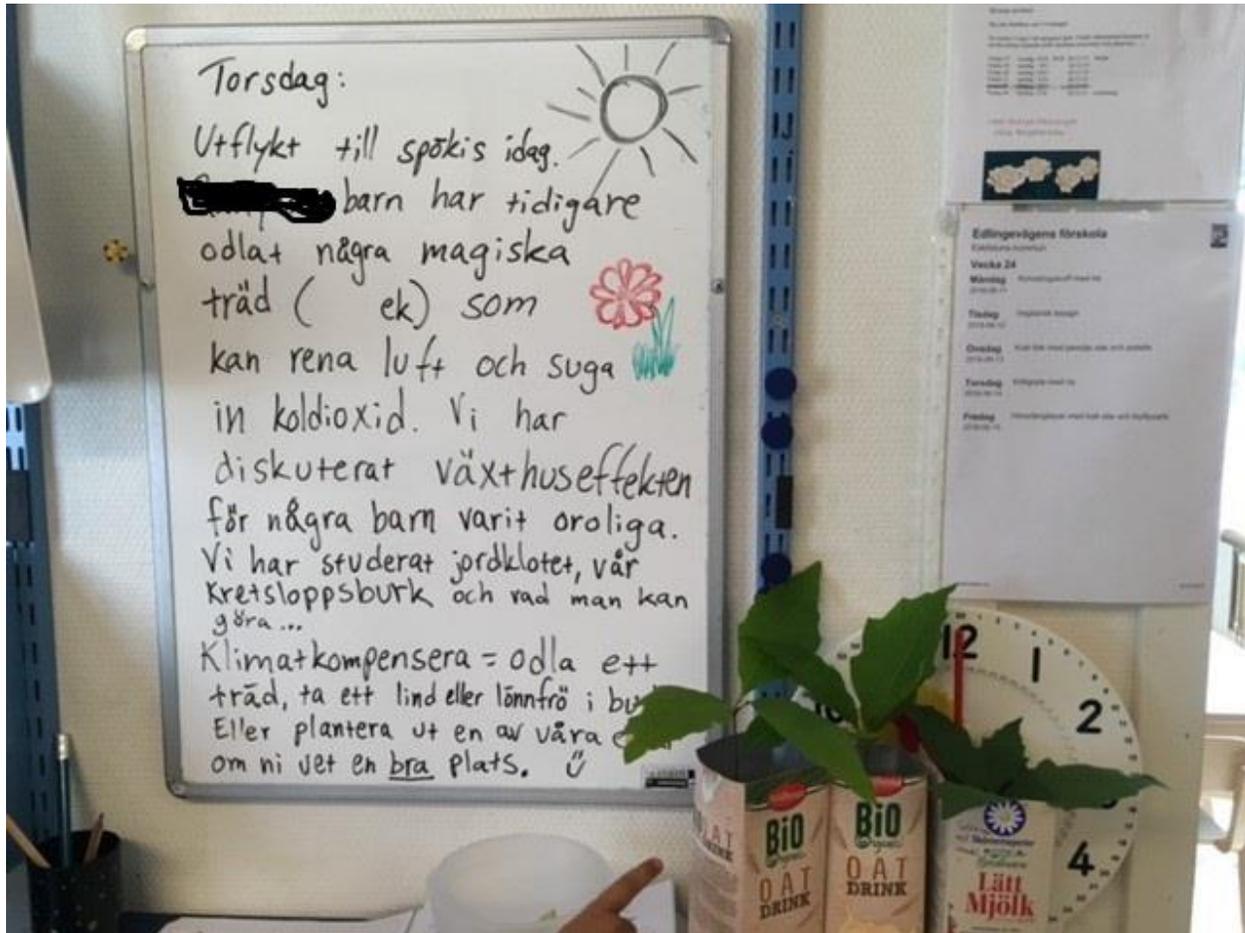
Figure 6: Tree planting

Hanna shared that it is important to notice the questions and issues about which children express anxiety, such as the troublesome greenhouse gas emissions. When this occurs, the teacher can help children manage their anxieties by working through problem-solving and helpful actions, as with the above story. The children now say, 'the trees get new homes with families and preschool staff who travel far by car and, once Covid-19 is over, by airplane'. Research has shown that young children can handle emotional challenges and respond with problem solving and directed actions (O'Gorman, 2020). Still there is a need to be cautious so children are not left stranded in identities such as "warriors or worriers" (Davis & Elliott, 2014). Thus, it is important for teachers to employ specific preschool climate action possibilities to develop the children's belief in a positive future and foster their competence and ability to solve problems and find new ways to act to promote sustainable futures. Activities such as the one described by Hanna do so by linking constructive actions to SDG 12 Sustainable Consumption and SDG 13 Climate Action in relation to climate change and the importance of trees for human survival.

The work for sustainability has continued at Hanna's preschool. Throughout autumn 2020, the children had many thoughts about Covid-19 and how it affected their families and other people. They discussed sustainability issues

connected to SDG 3 Good Health and Well-Being, SDG 6 Clean Water and sanitation, and SDG 11 Sustainable Societies. Hanna outlined how the children became very involved in the discussion when she posed the question: *How can we take extra care of each other now during these times of Covid?*

> *- There should be one more Bamse picture[2]!*
> *- Yes, where everyone washes their hands with soap!*
> *- Because then you are considerate of each other, take care so no one gets sick.*
> *- Yes, maybe the coronavirus will run out ...*
> *- Stops being transmitted, so it no longer exists.*

The children discussed elderly people's situation in a thoughtful way, and exchanged experiences:

> *after a while they decided that we should print out the Bamse picture that is the introductory picture in Bamse's situation pictures, where it says, "Take care of each other". So, we printed it out and the kids pasted it on a bar of soap. That's because they thought this was a way to care about each other. After some discussion, the children made me promise that sometime during the week we would together suggest to the editors of Bamse that a new situation picture could be one of teddy bear friends washing their hands, and we would write good questions for such a picture, such as: How can you take care of each other during a pandemic? What can you do so that adults will understand that it is important? What can you do so that no one will be alone or feel lonely? Then one of the children said: "I will become a researcher when I grow up. Then, I can come up with something that removes the corona virus from the whole world. Is that being a 'science man'?" - Yes, or woman ... says another child, and adds "I will experiment, so that everyone understands, and it will be so fun that no one misses it!"*

Thinking and talking together while building a learning culture required the presence of adults who viewed the children as competent actors whose knowledge, ideas, and thoughts were important. The children also verbally interconnected the SDGs then physically linked any interconnected goals with a ribbon (see Figure 7). For example, they talked about SDG 10, Reduce Inequality and SDG 4, Quality Education by stating: *Everyone must have the possibility to become what they want to be. And, to decide things. But, then you have to learn, and not all children go to school – every child must go to a school.*

In Hanna's story of the preschool program, the SDGs were an important pedagogical tool in the dialogues among children and children and teachers. It was significantly the children's own interests and curiosities that led and promoted the pedagogical processes. The preschool teachers both scaffolded and challenged children's evolving meaning-making. Democracy, human rights, children's agency, partnerships for sustainable futures, and gender equality were explicitly interwoven parts of Hanna's story. The many different aspects of sustainability intersected within a sharing, caring, and learning environment with environmental heroes at the fore as planetary guardians.

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[2] Bamse is a popular cartoon in Sweden. Bamse is a bear who becomes the strongest bear in the world by eating magic honey. The stories about Bamse are meant to improve children's knowledge, as well as to provide entertainment and ask big questions about friendship, and quality and sustainability issues. In this unit they use Bamse, educational materials, and situation pictures about friendship, wellbeing and health. https://www.bamse.se/okategoriserade/7-situationsbilder-nedladdning/
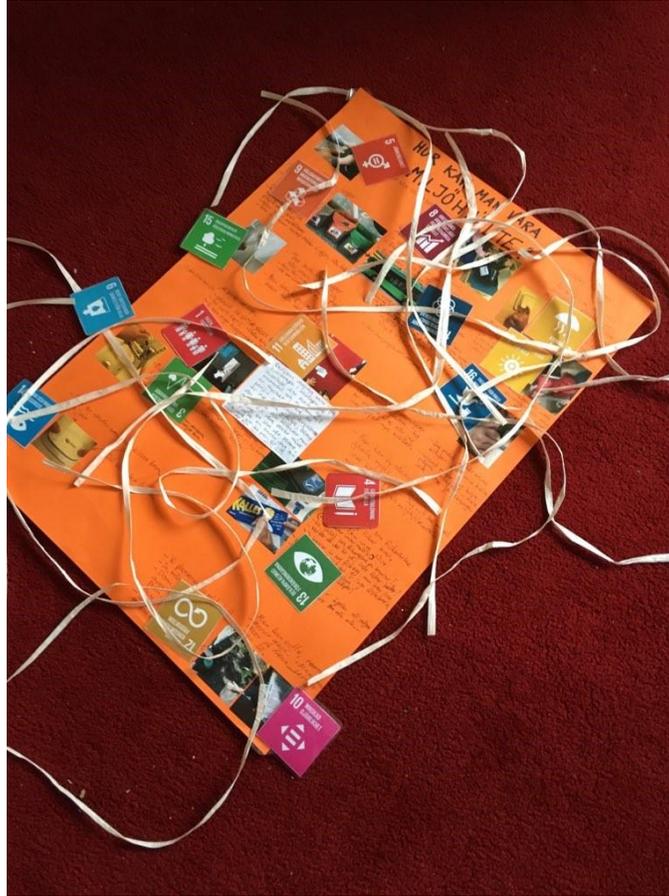
Figure 7: Interconnecting the SDGs

Concluding synthesis

The study aim was to employ narrative inquiry to develop knowledge about how EfS and the SDGs are explored in Swedish early childhood education. One of the difficulties of narrative inquiry lies in handling the story, in particular, how the story participants are represented or made visible in the data presentation (Clandinin et al., 2016). In the research process, a collaborative dialogic relationship between the researcher and the participating preschool teacher was established and critical to the study and its trustworthiness. Hanna's story was both engaging and informative because it demonstrated how intersecting major and minor politics (Dahlberg & Moss, 2005) can be handled within an early childhood education setting. In addition, it offers an example of what UNESCO describes as a strategic policy area on all levels (UNESCO, 2020a; UNESCO, 2020b; UNESCO, 2021) The Swedish Government has set high standards (SOU 2019), and the National Preschool Curriculum (Swedish National Agency for Education, 2018) has clear goals relating to sustainability. Hanna's story showed that, in her municipality, the politicians took responsibility for and initiated projects in sustainability with everyone, including the youngest children.

Hanna has long-term experience in early childhood education, and she demonstrated a strong commitment to sustainability and identified a unique challenge to adopt the SDGs as a pedagogical tool in everyday practice with children. In her story, we identified how Hanna's teaching and children's learning was centred on 13 of the total 17 SDGs. We can also see that teaching is not a question of explicitly transferring normative knowledge, but of promoting childrens' opportunities to notice and begin to talk. The teacher directed the children's attention towards the SDGs and specific aspects, and, together, the adults and children developed their knowledge of the SDGs (Pramling & Pramling Samuelsson, 2011). Hanna also ensured that the message she sought to convey became integral to the materials and play setting (Pramling Samuelsson & Asplund Carlsson, 2008). For example, the children

had ready access to the SDG's and Swedish national goals in the form of note cards, including images. These provided visual prompts to think, reflect, and create their own ideas. The preschool teacher knew what she sought to make concepts visible to the children but teaching always occurred within a context of interaction and communication among children and between teachers and children (Björklund & Pramling Samuelsson, 2020). Teaching, then, is where both children and teachers are engaged in a collaborative critical inquiry to challenge unsustainable thinking and actions in everyday life.

Another aspect of Hanna's story was how she handled emotional effects when disrupting taken-for-granted assumptions and finding new ways of acting (Jickling, 2017; Kopnina, 2020; O'Gorman, 2020) by implementing critical transformative pedagogies. Delving into the SDGs sometimes causes anxiety, which needs to be managed through transformation and transactions (Säfström & Östman, 2020). Approaches to alleviating these anxieties were demonstrated in both the tree planting and the Covid-19 projects. Hanna argues the need to maintain a balance so that children create hope for the future and are not, as Davis and Elliott (2014) caution, left stranded in identities of "warriors or worriers".

If we look to the global level, Stafinia Giannini, Assistant Director-General for Education at UNESCO, says: "Now is the time for every education system to lead the transformation that is needed to set our world on a more just and sustainable course, because our common future depends on our present actions" (UNESCO, 2020). We wholeheartedly agree, but it is also important to note that Hanna's story is the story of a teacher and children in a developed country that is rich compared to most of the world's countries. Many children globally do not even have access to preschool education, a perspective that places children who are able to spend their days in Hanna's preschool in a category of social privilege (UNESCO, 2021, forthcoming). Yet, another consideration is Hanna's background and her double competence as both a preschool teacher and an environmental public relations specialist. This article shows that knowledge and skills about sustainability and the SDGs, as well about how to implement the knowledge as part of the pedagogical practices with children, are crucial. This suggests a need for further professional learning, including change and improvements in the training of student teachers as well as in-service training for practicing educators. Still, with purposeful commitment and engagement, all early childhood educators can jointly create a space for cooperative learning and build knowledge about sustainability together with the children and their families.

Young children can be important agents for change, and Hanna and the children are inspiring role models for post-sustainability education that is disruptive and transformative (Jickling, 2017). Hanna's story is an example of an education where ethics, caring, curiosity, critical and disruptive dialogues, and problem-solving all challenge the assumptions that otherwise are taken-for-granted through transformation and transaction in the daily preschool activities. Her example is a call for further action which is required to go beyond "business as usual" to embed transformative and transactive teaching for promoting "planetary ethic and degrowth" (Kopnina 2020, p. 280).

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