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Climate Change Education in Early Childhood Classrooms: A Nature-Based Approach

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ABSTRACT

Climate change is an urgent global issue that requires concern and action among a climate literate citizenry. Early childhood climate change education (CCE) affords strong potential for developing this climate literate citizenry. Early childhood educators are critical for this endeavor, and their climate change perspectives, teaching practices, and resource needs must inform future curriculum and professional development. Thus, the purpose of this study is to better understand early childhood educators' perspectives on climate change instruction and use of CCE resources. An explanatory mixed-methods design was selected for this study. In the first phase, a quantitative survey was used to determine important types of CCE resources for early childhood. In the second phase, selected participants were interviewed to explain and elaborate on their quantitative results. In terms of findings, early childhood teachers particularly valued nature-based material resources, human resources that could improve their own climate change response knowledge, and social resources that included trustworthy sources of climate change information. Interviewed teachers elaborated on qualities that make CCE resources particularly useful: age-appropriateness, curriculum alignment, ease of use, engagement, place-based, and trustworthiness. In addition, we present a place-based example of a kindergarten climate change teacher who exemplifies the use and valuation of these CCE resources. Implications for curriculum development and teacher professional learning are provided.

Keywords: climate change education, place-based education, nature-based education, early childhood education, educational resources, environmental education

Climate change is an urgent global issue that is already having physical and human impacts worldwide (Intergovernmental Panel on Climate Change [IPCC], 2021). Mitigation and adaptation actions are critical for limiting the worst impacts of climate change (IPCC, 2021). Education is one strategy to prepare an informed citizenry that can contribute to individual and collective climate actions and advocate for governmental and intergovernmental climate responses (Anderson, 2012; Stevenston et al., 2017). Further, proponents of climate change education (CCE) suggest that education will reduce vulnerability and increase resilience (Muttarak & Lutz, 2014). However, in the US, climate change can be considered a distant concern, leading to a lack of urgency (Center for Research on Environmental Decisions [CRED], 2009; Leiserowitz, 2007). Additionally, many students do not often have an in-depth understanding of climate change (Leiserowitz et al., 2011; Shepardson et al., 2009; Shepardson et al., 2014).

One solution to preparing an informed climate literate citizenry is to introduce climate change topics into early childhood. In this study, we define early childhood education as formal education in the classroom with children between the ages of five and eleven. However, there are some challenges to CCE with young children. Elliott and Davis (2009) note that some educators maintain that environmental concerns are too challenging for young children to understand. Others argue that children feel they have limited power and are thus vulnerable to climate anxiety

(Hickman et al., 2021). Yet, Elliott and Davis (2009) assert that these arguments are specious and underestimate young children.

Several environmental and science educators have presented a strong case for why climate change instruction can and should be addressed in early childhood. First, young children have demonstrated their sophisticated reasoning about environmental problems (Palmer & Suggate, 2004) and pro-environmental solutions (Kos et al., 2016). Second, when environmental issues are taught in grade-appropriate ways, young children feel empowered to be a part of environmental solutions (Gambino et al., 2009). Third, compared to adults, young children are going to be both more impacted by climate change impacts and required to take adaptation actions (Hahn, 2021). Thus, young children's climate literacy is particularly important. Fourth, compared to adolescents who have less frequent outdoor experiences and lower nature connectedness (Chawla, 2020), young children have more pro-environmental attitudes (Otto et al., 2019) and willingness to take action (Lee et al., 2020). Further, young children are likely more receptive to climate instruction (Lieflander & Bogner, 2014).

Given this potential for early childhood CCE, environmental and science educators need to understand early childhood educators' perspectives, current teaching practices, and desired CCE resources for young learners. With this knowledge, environmental and science educators can develop resources that address barriers to climate instruction and align with early childhood educators' climate change teaching goals. Therefore, the purpose of this study is to better understand early childhood educators' perspectives on climate change instruction and use of CCE resources. Specifically, this study included early childhood science teachers in Northeast Ohio. The following research questions were used to guide this study:

- (1) What CCE resources do early childhood teachers identify as important for teaching about climate change?
- (2) What are early childhood teachers' perceptions of useful CCE resources?
- (3) What does climate change instruction look like in early childhood?

Framing the Study

This study was framed through the lenses of resources and place-based education. Educational resources are "assets that teachers can access in classrooms, school, or community contexts to improve their pedagogy and development" (Navy et al., 2020, p. 186). There are three main categories of resources (Lee et al., 2016; Spillane & Thompson, 1997), known as primary resources (Navy et al., 2020). In education, primary resources include material, human, and social (Navy et al., 2020). Material resources include physical handouts, curriculum, technology, equipment, and learning spaces (Lee et al., 2016; Navy et al., 2020). Human resources include an individual's knowledge and skills (Lee et al., 2016; Navy et al., 2020; Spillane & Thompson, 1997). Social resources include relationships, trust, and collaboration (Navy et al., 2020).

Previous research has demonstrated the importance of social resources in educational settings (Navy et al., 2020; Rivera Maulucci, 2010). For instance, Rivera Maulucci (2010) demonstrated the importance of colleague support for new science teachers. Similarly, Navy et al. (2020) found that new secondary science teachers most frequently accessed social resources, such as collaborating with peers. This study expanded on the resource literature by identifying the primary CCE resources used by early childhood teachers.

The frame of place-based education is also relevant to this study. Place-based education situates "learning in local phenomena and students' lived experiences" (Smith, 2002, p. 586). In the US, climate change can be considered a distant concern (CRED, 2009; Leiserowitz, 2007). Due to the lack of urgency, place-based education can be used to help communicate the severity of climate change (Gislason et al., 2021; Hernandez et al., 2022). Further, making climate change personally and locally relevant to students can increase agency (Littrell et al., 2020) and thus help to alleviate climate anxiety (Gallay et al., 2022).

Place-based education has been subdivided into five themes: cultural studies, nature studies, real-world problem-solving, internships, and induction into community processes (Smith, 2002). In this study, nature studies are

particularly relevant for CCE and young learners. In nature studies, students investigate “local natural phenomena” by exploring the outdoors or incorporating field trips (Smith, 2002, p. 588). Local learning can provide a foundation for learning about distant phenomena (Smith, 2002). In the context of CCE, students may first learn about local climate change impacts by noting the impacts of extreme weather events or phenological changes before broadening their understanding to global impacts.

Nisbet et al. (2009) proposed the construct of nature relatedness to address individuals’ appreciation for humans’ relationships with other living things and an understanding of the importance of the totality of nature. Nisbet et al. (2009) contended that nature relatedness has affective, cognitive, and experiential dimensions and found that this connection to nature was associated with environmental attitudes, behavior, and frequency of time in nature. Barrable (2019) asserted that nature connectedness should be a distinct goal in early childhood curricula and proposed a pedagogy of connection that includes contact and engagement with nature’s beauty, cultivating compassion towards non-human nature, and mindfulness. Interventions that engage students in natural environments have successfully improved young children’s connectedness to nature (Bruni et al., 2017; Cho et al., 2018; Kosta et al., 2022).

Globally, climate change impacts and severity vary from place to place. This study was situated in northeast Ohio, a midwestern state that does not have as extreme climate change impacts compared to some regions (i.e., coastal, or glacial) (Melillo et al., 2014). Therefore, teachers must find relevant and meaningful ways to connect learning about climate change with students’ experiences and knowledge relative to Ohio. The findings from this study offer implications for how early childhood teachers can incorporate place-based climate change topics into their curriculum, as well as which CCE resources they may be able to use.

Barriers to Climate Change Education

Clearly, climate change education is required to respond to current and future climate changes (Anderson, 2012; Herman, 2015), yet many teachers do not frequently include climate change in their curriculum due to significant barriers (White et al., 2014; Wise, 2010). A leading barrier is the need for quality CCE resources (Colston & Ivey, 2015; Foss & Ko, 2019; Sullivan et al., 2014; White et al., 2014). Specifically, teachers require CCE resources that are relevant, engaging, and encourage collaboration (Bozdogan, 2011; Monroe et al., 2019; Schweizer et al., 2013). A recent study on CCE found that national parks offer a variety of CCE resources that are collaborative, engaging, and offer place-based connections (Beaver & Navy, 2023). Thus, outdoor learning spaces can be a particularly useful material resource for climate change instruction.

Another barrier to climate change instruction is the limited formal education that educators receive. Climate change is a complex interdisciplinary subject (IPCC, 2021). Yet, the literature indicates that most teachers do not receive a formal education on climate change (Colston & Ivey, 2015; Plutzer et al., 2016). For instance, Plutzer et al. (2016) found that less than half of the teachers they surveyed reported any climate science instruction in college. Instead, most science teachers learn about climate change informally, often through books and websites (Colston & Ivey, 2015).

A final barrier to CCE is alignment with the curriculum (Colston & Ivey, 2015; Foss & Ko, 2019; Hannah & Rubart, 2020; Sullivan et al., 2014; White et al., 2014; Wise, 2010). White et al. (2014) identified that science teachers are more likely to include climate change in their curriculum when they have content standards. Similarly, Hannah and Rubart (2020) found that teachers spend more time teaching about climate change when they have explicit standards. For early childhood teachers, this may be especially difficult due to the limited climate change standards (Next Generation Science Standards [NGSS] 2013; Ohio Department of Education [ODE], 2018).

In the US, individual states have their own set of science standards, and thus, climate change instruction can vary significantly. For instance, the Ohio Learning Standards Model Curriculum has only one mention of climate change in early childhood in the fourth-grade standard 4.LS.1. The standard states that “Ecosystems can change rapidly (e.g., volcanic activity, earthquakes, fire) or very slowly (e.g., climate change)” (ODE, 2018, p. 103).

The National Center for Science Education (2020) completed a state-by-state analysis of climate change science standards. Each state was assigned an overall grade based on four key points: (1) climate change is real, (2) climate change is anthropogenic, (3) climate change negatively affects nature and society, and (4) there is hope through mitigation and adaptation. Ohio received a score of a “D” on its climate change standards, indicating poor climate change connections. Only five US states (Alaska, Colorado, New York, North Dakota, and Wyoming) received a score of an “A” on their climate change standards. Hence, the US has a long way to go in order to have a robust climate change curriculum across all states.

Weldermariam et al. (2017) compared the early childhood sustainability curriculum in five countries: Australia, England, Norway, Sweden, and the US. The authors analyzed the curricula for four major themes, including the presence of sustainability, the view of the child, human-environment relationships, and philosophical and theoretical underpinnings. The authors found several differences across the five curricula. First, only Australia and Norway explicitly addressed sustainability in their curriculum. Further, Australia, Norway, and Sweden discussed outdoor learning, whereas England and the US did not. Second, the five curricula offered different views of children. Sweden, Australia, and Norway viewed children as active agents in learning. While England and the US treated children not as active agents but as supported by adults. Third, the five countries had similar views concerning the human-environment relationship, in which children could act upon the environment, including caring for and appreciating the environment. Finally, the authors determined that the five curricula were “predominantly based on child-centered sociocultural, social constructivist and Piagetian developmentalism learning theories, relating children’s learning to activities, experiences and situations, and interactions with their physical environments” (Weldermariam et al., 2017, p. 347).

Early Childhood Climate Change Education

Young children have some understanding of climate change. When asked about the impacts of global warming on polar creatures, very young (four-year-old) children described short-term effects, but 90% of ten-year-olds suggested reasonable long-term effects (Palmer & Suggate, 2004). In fact, in a review of youth perceptions of climate change, most children accurately understand climate change impacts as including rising temperatures, melting ice caps, and ecosystem changes (Lee et al., 2020).

Some areas of climate change are less well-understood at the early childhood level. In Boylan’s (2008) survey of Australian elementary students, only 59% of children correctly identified that “climate change, greenhouse effect and global warming all mean different things” (Boylan, 2008, p. 12). Children’s understanding of the causes of climate change varies in correctness, from pollution fumes (correct) to common climate change misconceptions such as a hole in the ozone layer, the sun getting nearer to the Earth, and seasonal change (Lee et al., 2020; Palmer & Suggate, 2004). Although children understand some common impacts of climate change, they tend to believe these impacts are on “wild” organisms rather than on agriculture and humans (Lee et al., 2020). To address these areas of misunderstanding, many science education researchers recommend teaching climate change at the early childhood level (Boylan, 2008; Lee et al., 2020).

Although often not specifically addressing climate change, early childhood-level environmental education interventions have yielded very positive results. Children ranging from ages four to six have improved environmental knowledge (Gambino et al., 2009), environmental attitudes (Gambino et al., 2009; Samur, 2018), and an awareness of how they, as humans, influence the environment (Kos et al., 2016; Samur, 2018). Furthermore, early childhood-level interventions may find a particularly receptive audience given that environmental attitudes and behaviors are moderately high from six to eight years of age, increase from ages seven to ten, plateau until high school age, and then decrease until adulthood (Boyes et al., 2008; Collado et al., 2015; Evans et al., 2007; Otto et al., 2019).

Few studies have addressed early childhood teachers’ perspectives of climate change instruction. When interviewed, several preschool teachers indicated that teaching climate change in an early childhood context was not a developmentally appropriate practice because children have a limited understanding of time and climate change instruction might engender hopelessness in young children (Ginsburg & Audley, 2020). These teachers cited lack of curricular time and inadequate family engagement as barriers to teaching about sustainable practices (Ginsburg &

Audley, 2020). Yet, early childhood teachers believe environmental education in natural settings promotes children's connection to nature and readily accept their role as co-explorers of nature with students (Beery & Fridberg, 2022). Further, in a global study of an early childhood Education for Sustainable Development curriculum, researchers found that adults consistently underestimated children's knowledge about the environment and sustainable practices (Engdahl, 2015).

Methods

This study was a sequential explanatory mixed-methods design that included a quantitative phase and a qualitative phase (Creswell & Plano Clark, 2018). A sequential explanatory design was selected so that quantitative trends could be further explored in qualitative interviews. In the first phase, quantitative survey data were collected and analyzed to better understand early childhood teachers' interest in CCE resources. Next, interview questions were designed based on the quantitative data. In the second phase, selected participants were interviewed to explain and elaborate on their quantitative results.

This study's sample was part of a larger study (n=54) in which K-12 science teachers were purposefully selected from 41 schools near a national park. All the selected schools were within a 30-minute drive to the park. The overall response rate was found to be 10.9%. Surveys were excluded from this study if participants were not in early childhood or did not complete all aspects of the survey.

In total, 22 early childhood science teachers were included in this study. These teachers represented grades K-5, teaching students within the age range of five to eleven. Table 1 shows participants' experience, grade level, and school classification. In addition, the majority (59.1%) of participants planned to teach about climate change during their current school year, and 31.8% reported having climate change standards in the grade level in which they teach.

Table 1
Participant Experience, Grade Level & School Classification (n=22)

	n	%
<u>Grade Level</u>		
K-2	9	40.9
3-5	13	59.1
<u>School Classification</u>		
Public - Rural	0	0
Public Suburban	19	86.4
Public - Urban	0	0
Private	3	13.6
<u>Teaching Experience</u>		
0-5 years	2	9.1
6-10 years	5	22.7
11-15 years	2	9.1
16-20 years	8	36.4
21-15 years	4	18.2
26+ years	1	4.5

An item on the survey asked participants if they would be willing to be contacted for a follow-up interview, and 10 indicated interest. All participants who indicated a willingness to be interviewed on their survey were contacted. For participation in the interviews, participants received a \$10 Amazon eGiftCard. In total, four participants were interviewed during the qualitative phase (see Table 2). These teachers were given pseudonyms to ensure confidentiality.

Table 2*Qualitative Participants (n=4)*

Pseudonym	Grade Band	Teaching Experience (year)	School Classification
James	K	11-15	Public - Suburban
Katelyn	3	16-20	Public - Suburban
Melissa	K	16-20	Public - Suburban
Elizabeth	2	16-20	Public - Suburban

Quantitative Data Collection & Analysis

Quantitative data consisted of closed-ended survey responses using an author-designed instrument. The survey was created on Qualtrics following the guidelines of Fowler (2014) and Ruel et al. (2016). For content validity, the survey was pre-tested with seven educational experts, including four education doctoral students and three education professors. The survey was updated based on expert feedback, including making questions more descriptive, changing to Likert-style questions, and adding an exhaustive list of responses.

Within the survey, participants were asked questions about their climate change teaching and interest in CCE resources. For instance, the first section asked teachers about their plans to teach about climate change and their climate change standards. In the second section, participants were asked resource-specific questions. For instance, participants were asked to rate the importance of material, social, and human CCE resources. A question asked, "Please rate the following items in terms of importance to you in relation to teaching about climate change," and responses included "not important," "slightly important," "moderately important," "important," and "very important."

The survey was distributed to all science teachers within the previously described geographic area. Teachers received three follow-up emails, each spaced ten days apart. The survey was closed after 40 days, and survey data were downloaded from Qualtrics. Quantitative data were analyzed using frequency distributions and descriptive statistics.

Qualitative Data Collection & Analysis

Qualitative data consisted of follow-up interviews with four participants conducted by the authors. The interviews were semi-structured to allow the researchers to dive further into certain topics or discussions. The interview questions were designed after quantitative data analysis so that the interviews could be used to expand upon the quantitative results. For instance, participants rated collaborative resources as the least important. To further understand this finding, we asked the follow-up question, "How important is it to you to have opportunities to collaborate with scientists for your own climate change learning or your student's learning? Please explain."

The qualitative sample was contacted via email to schedule an interview at their convenience. The audio-recorded interviews occurred through Google Meet and lasted from 20-39 minutes. During the interview, participants were asked questions about their climate change teaching, use of CCE resources, and interest in CCE resources.

After the interviews, the audio recordings were transcribed using Otter AI transcription software. The first and second authors then analyzed the transcriptions in Dedoose through multiple rounds of coding. Coding procedures were followed with guidelines from Saldaña (2021). To answer research question two, "What are elementary teachers' perceptions of useful CCE resources?", data were coded using an inductive approach. Hence, we developed codes as we went through each transcript. For instance, when Katlyn mentioned that she would like to "prioritize things that are more hands-on, more site-based, more engaging" the codes "place-based" and "engaging" were developed.

To answer research question three, "What does climate change instruction look like in early childhood?", data were coded using both a deductive approach and an inductive approach. The initial resource codes of "material," "social,"

and “human” were developed prior to coding to represent the three primary resources (Navy et al., 2020). However, inductive codes were developed for climate change topics, including “biotic,” “abiotic,” and “action.” In addition, participants described many types of material resources, and thus, these were coded inductively as well.

The coding process occurred in several cycles. In the first cycle, we coded two transcripts together, and discussion occurred on any disagreements to reach a consensus code. For instance, James described a Ranger-led experience in a local park. The first author wanted to code this section as a social resource. The second author then explained that the park itself is also a material resource. After discussion, both “social” and “material” codes were applied to the Ranger-led experience within a park. After the first cycle, we collapsed codes and developed an initial code book.

In the second cycle, we coded the last two transcripts together, again discussing any disagreement on the codes until we reached a consensus. We updated our codebook at this point and again collapsed codes into larger categories. For instance, “convenient” and “easy to use” were collapsed into a single code of “ease of use.” We then used these consensus codes to develop assertions related to our research questions, as presented in the Results section.

Results

Important Types of CCE Resources for Early Childhood

To answer the first research question on important CCE resources, data were analyzed from the surveys (n=22). Participants were asked, “Please rate the following items in terms of importance to you in relation to teaching about climate change” and response options included a 5-point Likert scale from “not important” to “very important.” The data were analyzed using frequency distributions (see Table 3). Qualitative interviews were used as a secondary data source to help elaborate on the quantitative results.

Table 3

Teachers’ Perceptions of “Important or Very Important” CCE Resources (n=22)

	n	%
<u>Material Resources</u>		
Having access to CC curriculum and/or lesson guides and worksheets	18	81.8
Having access to CC data	17	77.3
Having access to technology/tools for teaching and learning about CC	20	90.9
Having access to outdoor classrooms for teaching and learning about CC	18	81.8
<u>Human Resources</u>		
Attending professional development about CC education	15	68.2
Improving my own knowledge of the causes of CC	17	77.3
Improving my own knowledge of the evidence of CC	17	77.3
Improving my own knowledge of the impacts of CC	17	77.3
Improving my own knowledge of the response strategies to CC	19	86.4
Improving my own science skills/practices for studying CC	16	72.7
<u>Social Resources</u>		
Collaborating with scientists about CC	12	54.5
Collaborating with other science teachers about CC	11	50.0
Collaborating with the local community about CC	9	40.9
Trusting where my CC resources come from	20	90.9

The survey had three sections representing material, human, and social CCE resources. For material resources, participants selected “having access to technology/tools for teaching and learning about CC” as the most important material resource with 90.9% selecting either “important” or “very important.” For human resources, participants selected “improving my own knowledge of the response strategies to CC” as the most important human resource with 86.4% of participants finding this resource “important” or “very important.” Finally, for social resources,

participants selected “trusting where my CC resources come from” as the most important social resource with 90.9% selecting either “important” or “very important.”

Across all the listed CCE resources, participants identified “trusting where my CC resources come from” as the most important. In total, 18 of the 22 participants selected “very important” for this resource. Whereas “having access to technology resources/tools for teaching and learning about CC” only 10 participants selected “very important”. The qualitative results helped to explain the importance of trust regarding CCE resources. Katelyn, a third-grade teacher, shared:

So, I just think it's important that I have the best and latest information. You know, when you're teaching something, you want to make sure that what you're teaching is the right stuff and you're doing what is, you know, currently the best thoughts on the topic. So, I think it adds to my credibility as their teacher that I'm providing them with the latest and most current information.

When comparing the different types of CCE resources, the items on collaboration were found to have the lowest importance to participants. Specifically, “collaborating with the local community” was identified as the lowest importance, with only 40.9% of participants finding this important. Collaborating with other science teachers (50.0%) and collaborating with scientists were also low (54.5%).

The qualitative results helped to explain the low interest in collaboration. James, a kindergarten teacher, explained the challenges of having professionals work with children sharing:

I've had scientists come in or chemists and doctors and people come in and try to do work in the classroom. And that's the biggest challenge is having somebody of, you know, just a great mind and science come in and try to break it down and make it presentable for a five-year-old, without the five-year-olds going to sleep.

Useful Qualities of CCE Resources for Early Childhood

The qualitative sample of early childhood science teachers (n=4) shared their perceptions of useful qualities of CCE resources. Six themes emerged from the qualitative interviews (Table 4). Participants most frequently discussed useful qualities associated with age-appropriateness, engagement, and place-based connections.

Table 4
Teachers' Perceptions of Useful Qualities of CCE Resources (n=4)

Useful Qualities of CCE Resources	Example Quote
Age-Appropriate	“Just ways to set up, you know, age-appropriate projects for them to do ways to get them involved.” (Katelyn)
Curriculum Alignment	“Resources and kind of like, concepts that if they could intertwine to the current curriculum, so I could like take it and just kind of fan it out a little bit bigger.” (Melissa)
Ease of Use	“At least in my district, it's got to be kind of quick and easy.” (Elizabeth)
Engaging	“Try to like prioritize things that are more hands-on.” (Katelyn)
Place-based	“I would like to see some units that are based locally.” (James)
Trustworthy	“Years of data, years of science to back it up.” (James)

Participants most often discussed the importance of having CCE resources that are age-appropriate for their young students. Melissa explained that very little direct climate change content is addressed in kindergarten. Instead, students learn about the needs of living things. For example, Melissa asked, "If we get rid of all the ice, then where are the polar bears gonna catch their seals?" Similarly, Elizabeth, a second-grade teacher, also approaches the topic of climate change through ecology. She explained that "climate change is a little, you know, bit bigger for them. But they can think of it... more as if I take care of the Earth, then there'll be trees."

Participants frequently described the importance of having engaging CCE resources. Elizabeth described wanting to do a hands-on project where students build bird feeders to learn about taking care of the Earth. In connection to climate and being good stewards, Elizabeth would tell students, "We're gonna help take care of the birds by putting out something in the cold weather; they'll have something to eat." Katelyn also described prioritizing resources that are hands-on or project-based for her students.

Place-based CCE resources were also commonly discussed by the participants. Katelyn described wanting site-based CCE resources and explained the importance of making learning "relevant and real to a child, and they can see it like in their own backyard." Similarly, James discussed the importance of using CCE resources relevant to Ohio. In his classroom, James connects climate change to monarch butterflies and maple trees, things his students can literally find in their backyard or outdoor classroom.

To a lesser extent, participants also discussed alignment with the curriculum, the trustworthiness of CCE resources, and the ease of use. Melissa described wanting CCE resources that are situated in the state's science standards. Elizabeth explained the importance of having trustworthy CCE resources: "It adds to my credibility as their teacher that I'm providing them with the latest and most current information." Finally, James explained that climate change units should be "easily replicated in the classroom for teachers that are not as comfortable teaching this topic."

Climate Change Instruction in Early Childhood

To explain what climate change instruction looks like in early childhood education, this section is split into three parts. First, primary CCE resources relevant to early childhood education are discussed. Next, climate change topics in early childhood education are shared. Finally, an example is presented to show how climate change can be taught in kindergarten through a place-based nature lens.

Primary CCE Resources in Early Childhood

The qualitative participants (n=4) discussed material, social, and human CCE resources at the early childhood level. Most frequently, participants discussed material resources and described several types of material CCE resources (Table 5). The most frequently discussed material resource was the use of natural spaces. James shared that his district has an outdoor classroom and that the students "look forward to our day, every day, because we have an outdoor classroom." In the outdoor classroom, James' students plant flowers for the butterflies and track animal prints, and he has also used grants to take students to local parks. Melissa also uses outdoor spaces for learning about climate and ecology. Her students observe and sketch nature, including nuts and trees, to understand their ecological importance.

The use of climate change related books at the early childhood level was also discussed frequently by participants. For example, Melissa discussed using fiction and nonfiction books about caring for the Earth. Similarly, James described building a read-aloud collection connected to climate change; his collection includes books on trees, monarch butterflies, and forests. James explained that he can use this read-aloud collection cross-curricular in science and reading. Finally, Elizabeth described using the *TIME for Kids* magazine to learn about taking care of the environment.

Table 5*Types of Material CCE Resources (n=4)*

Material Resources	Example Quote
Books	"I've been kind of building this set of read-alouds." (James)
Live Species	"We've planted plants in the in the outdoor classroom." (Elizabeth)
Natural Spaces	"But going out into a park and kind of seeing the effects of it or getting a hands-on real-world experience, I think would be really great for them." (Katelyn)
Natural Materials	"They like rocks and nuts and leaves." (Melissa)
Projects	"They're also gonna make little bird feeders outside there." (Elizabeth)
Trunk/Tool Kit	"Ohio Department of Natural Resources, they have trunks that you could rent out." (James)

To a lesser extent, trunks or tool kits were also described as a material resource used to teach about climate change. For instance, James explained that he could order a trunk from a local park to use in his classroom. This trunk would include natural materials such as furs and animal prints. These materials could be used to discuss animal migration. However, James explained that he needed to order the trunks a year in advance because "there's so few and far between." Katelyn explained that she likes toolkits because they are readily available, and she does not need to find the materials herself.

Next, teachers described using social CCE resources. Some teachers discussed interacting with park rangers on field trips. For instance, Elizabeth explained that rangers interacted with her students in the forest by pointing out living things and discussing them with the students. She further shared, "The parks are again really very important, and I kind of wish there was a little more collaboration with them." James described collaborating with the Environmental Education Consortium of Ohio (EECO), which has a network of naturalists.

Finally, teachers described the importance of their knowledge, a human resource, regarding climate change. For instance, Katelyn explained that professional development (PD) on climate change could help "to grow my knowledge in this area and to think about ways to incorporate climate change into what I'm already teaching." Similarly, James explained that he would like to learn "more of the scientific terms, more of the processes, so I can feel comfortable teaching that to my students." He further explained the importance of providing students with accurate information on climate change.

Climate Change Topics in Early Childhood

The qualitative participants (n=4) discussed connecting climate change topics to biotic factors, abiotic factors, and pro-environmental actions. Teachers most frequently connected climate change topics to biotic factors such as animals and ecology. Melissa discussed deforestation in the Amazon with her students and explained that "people are cutting down the rainforest, so there's not as much places for them [animals] to live." Similarly, Elizabeth also introduces climate change by discussing how animals are impacted. She explained that in early childhood, "It's mostly like where pollution and climate change and things like that come in with animals and how it changes our environment, their environment, living things...and talking about, you know, how we're going to keep that from happening." Finally, James introduces climate change by discussing seasonal and migrational changes.

Participants also described connecting climate change topics through pro-environmental actions. Elizabeth explained that in second grade, talking about “actual raising temperature and the polar ice caps, that’s a little beyond what they can hit.” However, students can think about climate change in terms of taking care of the environment. Elizabeth elaborated that her students learned about the importance of plants providing oxygen and then acted by planting new plants in an outdoor learning space. In the future, Elizabeth would like to have her district’s high school students collaborate with her early childhood students to construct bird feeders to help care for the Earth. Similarly, Melissa wanted her students to learn how they “can be good stewards of the environment” by conserving resources and limiting pollution.

A few participants even described collective action. For instance, Melissa shared that her students can take action by creating an “opinion piece about saving the planet.” While James and his students take pro-environmental actions by creating action posters to spread awareness about issues like pesticide use impacting bees and the lack of resources for butterflies. He further explained that his students “feel empowered” to bring awareness to these issues, and they “do a lot of like posters and like public outreach programs at a kindergarten level.”

Finally, to a lesser extent, teachers described connecting climate change to abiotic topics such as weather and energy. For instance, Melissa discussed energy alternatives, like solar energy, with her students. In addition, Melissa shared that she frames her teaching as “solution-oriented and not doomsday-oriented.” In contrast, Elizabeth introduces her students to weather and introduces natural disasters. As this is an introduction, she does not feel that at this age, students need to hear “the extra step to say there’s more natural disasters because of warm weather.”

James’ Example: Teaching Climate Change Through Place-Based Nature

James is a kindergarten teacher in northeast Ohio, working with students ages five to six. We share his teaching because his climate change instruction uses a wide range of CCE resources, illustrates several broad trends from the quantitative survey, and exemplifies how climate change can be addressed at a very young age. James indicated that he does not have any climate change standards at his grade level. In addition, he explained that his students cannot understand climate change impacts worldwide, or even in other US states, because “that’s not part of their life.” However, James described himself as “personally invested in wanting to do something about climate change.” Thus, regardless of explicit climate change standards, James finds a way to incorporate place-based climate change instruction into other relevant science topics.

In the fall, James connects climate change to the monarch butterfly, a species that migrates through Ohio. James reads *Winged Wonders: Solving the Monarch Migration Mystery* by Pincus (2020), a picture book that explains how citizen science was used to understand monarch migration. In addition, his students become invested by raising their own monarch butterflies. With a foundational understanding, James then explains how climate change impacts their food sources and that both climate change and deforestation has landed them on the endangered species list. When James asks his students what actions they can take to help the monarchs, they respond by sharing, “We really want to plant more wildflowers because that’s what they eat, and we really want to plant more milkweed because that’s where they lay their eggs.”

During the winter season in Ohio, James incorporates climate change into topics of forest ecology. James reads the book *Can You Hear the Trees Talking? Discovering Hidden Life of the Forest* by Wohlleben (2019). Students also learn about species’ needs in the winter including shelter, food sources, and hibernation. Then, for a place-based project, students create their “own animal based on what animals in Ohio have to do to survive the winter here.”

In the springtime, James connects climate change to the maple trees in Ohio. In their outdoor classroom, they have about ten maple trees that they tap each year to collect maple syrup. James explains how the seasons are shifting due to climate change and that it is difficult to know when the sap will run out. James further explains that they are completing their first maple syrup boil earlier in the season than in previous years.

Moving forward, James shared that his main goal in relation to teaching his students about climate change is to give his students as much experience in nature as possible. James referenced the book *Last Child in the Woods* by Louv (2008) and explained that students are getting “pulled away from that natural connection.” Thus, his goal is to provide his students with as much time outdoors as possible to develop an emotional connection with nature. With this emotional foundation, James feels that his students will grow up being concerned about environmental issues.

Discussion

Educational resources can be considered material, social, or human (Navy et al., 2020). The findings from this study indicate that material resources were most important to this sample of early childhood teachers for climate change instruction. Material resources included natural spaces, natural materials, books, projects, and tool kits. Often, these material resources had a nature-based connection.

During the qualitative interviews, participants elaborated on the use of material CCE resources. One important material resource that emerged was the use of natural spaces to teach about climate change. James used his outdoor classroom to teach about climate changes that impact local maple trees and migrational butterflies. Previous research (Fisher-Maltese, 2016) supports the potential of outdoor school gardening experiences for promoting environmental attitudes like those in James’ classroom.

Children’s books about climate change were another CCE resource that was highly valued, used, and sought by this study’s interview participants. However, children’s books about climate change tend to lack informational text, address distant habitats, emphasize impacts on non-human organisms, and emphasize individual and political action over collective action (Benevento, 2023). Children’s books may also underemphasize the role of plants for mitigating climate change (Jones & MacLeod, 2022). Clearly, teachers are seeking high-quality children’s books that are free of these limitations.

One material resource not often cited in literature was the use of trunks or toolkits. Participants described renting trunks from local parks. The trunks can contain curriculum materials and natural materials for students to engage with. However, James explained that the limited availability of these trunks was a significant barrier. This limited availability is understandable, as a trunk of natural materials is much harder to reproduce than handouts or virtual resources. Yet, because of this limited availability, teachers may not have access to this engaging and often place-based resource.

Collaboration is considered a social resource (Navy et al., 2020). Climate change education literature highlights the importance of having collaborative CCE resources (Monroe et al., 2019). Therefore, it was surprising to see that participants rated the collaboration survey items as the least important. This also differs from past educational resource studies that have found social resources to be prominent (Navy et al., 2020; Rivera Maulucci, 2010). The qualitative interviews helped to explain this surprising result in that these social resources are sometimes not age-appropriate for engaging young learners. Hence, collaboration at the early childhood level may not be as important compared to older grade levels.

Trust is also considered a social resource (Navy et al., 2020). Although most of the social items were ranked low importance on the survey, participants ranked “trusting where my climate change resources come from” as very important. Katelyn explained that sharing credible climate change information with her students is essential. As a barrier to CCE includes limited formal learning about climate change, it is understandable why teachers place high importance on finding trustworthy resources (Colston & Ivey, 2015; Wise, 2010).

Regarding the useful qualities of CCE resources at the early childhood level, participants most often discussed engagement, age-appropriateness, and place-based connections. Engagement was not a surprising quality identified as several studies on CCE point to the importance of having engaging resources (Bozdogan, 2011; Monroe et al., 2019). When participants described engaging resources, they discussed hands-on projects such as building bird feeders to help care for Earth.

Relevant to early childhood education, participants discussed the importance of age-appropriate climate change content. Unlike critics of early childhood climate education that maintain that climate instruction at young ages is not a developmentally appropriate practice (Ginsburg & Audley, 2020), several of this study's teachers maintained that climate change instruction could be age-appropriate. Multiple teachers explained that the complexities of global climate change were too large for their students to understand, but they could understand local climate changes and how to take care of the Earth. In this way, using local place-based CCE resources was a way of making climate instruction age-appropriate.

Participants also more explicitly discussed the importance of having place-based CCE resources. Place-based education is particularly important in CCE to convey the urgency of climate change (Gislason et al., 2021; Hernandez et al., 2022). In this study, participants frequently described using several nature-based material resources, including natural spaces, live species, natural materials, and nature-related books to teach about climate change. These material resources exhibit place-based learning through the theme of nature studies (Smith, 2002). For instance, James used his outdoor classroom to teach about the climate changes to maple trees. However, Smith's (2002) other place-based themes were not described by participants, such as cultural studies. This may be a missed opportunity as cultural connections can be used to make climate change relevant to students.

Finally, James' example was included to show a place-based nature approach to teaching about climate change. James noted that his students could not understand the complexities of global climate change. Yet, James was able to teach his students about climate change by focusing on local nature studies about maple trees and monarch butterflies (Smith, 2002). Therefore, James' example shows that regardless of geographic location, climate change instruction can be made local and relevant to students.

Limitations

A few limitations of this study may limit the generalizability of this study's findings. First, the sample of early childhood teachers was part of a larger study where participants were purposefully selected from schools in northeast Ohio near a public park. These selected teachers do not represent the full knowledge of all early childhood teachers. Further, these participants may be biased in favor of using natural spaces and materials due to their proximity to a public park. Second, only a limited number of survey participants were interviewed. Some participants who were contacted for an interview expressed not having the time. A larger qualitative sample would have given further insight into climate change teaching.

Implications

Findings from this study have implications for early childhood teachers and informal sectors. Early childhood science teachers should try to incorporate introductory climate change topics into their curriculum even when explicit climate change standards are not available. Teachers can connect climate change topics to standards on ecology and weather (NGSS, 2013; ODE, 2018). Further, teachers should incorporate place-based connections to climate change to communicate the urgency of climate change and inspire action. One way to do this is through using nature-based material resources. If teachers have access to an outdoor classroom, they can use natural spaces, including live plants and animals, to discuss how climate changes impact local species. If teachers do not have access to the outdoors, they can still use natural materials and nature-based books in the classroom.

Informal sectors, including parks, zoos, and aquariums, should consider collaborating with early childhood teachers in the creation and sharing of nature-based CCE resources. These informal sectors could also share access to their outdoor spaces. Further, due to the high interest in natural materials, informal sectors can work to create additional trunks for teachers to rent out. Finally, these sectors may even consider creating PD to teach about local place-based connections to climate change.

Future research should explore students' experiences and outcomes associated with nature-based CCE resources. Studies could research if the use of these materials impacts students' perceptions or knowledge regarding climate

change. Further, studies could investigate if experience in outdoor spaces influences students' environmental agency.

Conclusion

Overall, the survey and interview responses indicate that early childhood science teachers are interested in teaching about climate change, regardless of their limited state standards. Climate change can be introduced to young students through topics of ecology and pro-environmental actions. To be both relevant and age-appropriate, early childhood teachers make local, place-based connections to climate change. Nature-based material resources were found to be especially important for early childhood. Climate change can be challenging to teach at the early childhood level, yet these teachers show it is possible.

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Investigating the Role of Materiality in Pre-Primary Children's Land Art

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ABSTRACT

Natural materials provide children opportunities for artistic engagement, which encourages a dialogue between children and material and provides a platform for children to discuss their perspectives on significant issues like sustainable futures. This article examines the land art characters created by pre-primary education children in the garden of the University of Turku's Rauma campus. The study is part of a STEAM-themed learning process that was conducted in a pre-primary group (children aged six to seven years) during the spring of 2022, based on Freinet's pedagogy. The study uses multimodal content analysis to analyze the children's land art pieces and their character-based storytelling. The results indicate that the children were able to effectively use natural materials to create unique characters by selecting appropriate materials, colors, and shapes to highlight their features. The shapes of natural materials served either as building blocks for the characters or helped them realize the characters they imagined. Further, the garden was found to be a significant location for outdoor learning, as it provided a space for children to engage in activities such as creating land art and exploring nature.

Keywords: land art, pre-primary education, learning environment, nature materials

Early childhood education (ECEC) in Finland has a rich history of incorporating diverse aspects of sustainability, such as promoting contact with nature and safeguarding the environment. However, promoting social equity and diversity using sustainability education as a conceptual framework is recent, and there is a lack of common understanding and practice in teaching settings as to how sustainability can be approached in ECEC (Furu & Heilala, 2021). In addition, studies indicate that children and youth frequently feel that their opinions regarding environmental matters and sustainability are disregarded or overlooked (Kumpulainen et al., 2020; Manni et al., 2013).

This present study discusses arts-based making and the role of materiality in the land art process of a group of pre-primary children's that took place in a garden environment near the school and aiming to promote the preschoolers' contact with nature. The art technique chosen was land art, which according to Solberg (2016) incorporates natural materials such as leaves, cones, branches, pebbles, rocks, sand, and seashells and encompasses diverse interpretations that are open to everyone. Land art is linked to physical interaction and the use of materials with the immediate environment (Solberg, 2016). Land art was chosen for the study because it is often considered a fusion of artistic expression and ecological awareness (Stathopoulou, 1997).

In addition, ECEC research has scrutinized land art as a pedagogical approach for young children; its value has increasingly been acknowledged. According to previous studies (Amus, 2013; Chawla et al., 2014; Kuo et al., 2019), land art develops children's creativity, curiosity, and sense of connection with nature. Furthermore, incorporating green spaces into the educational practice enhances children's well-being and learning (Amus, 2013; Chawla, 2015). This means that the integration of art into environmental education can offer enjoyable, engaging, and experiential

learning opportunities for children to discover and understand nature (Foster, 2017). Solberg (2016) reports that site-specific activities that use natural resources heightens the environmental consciousness of preschool children and their teachers.

By exploring ways of encountering the environment through a materialistic lens, we can begin to reimagine the role of materials in our lives and move toward more sustainable and environmentally conscious practices. Developing pedagogical practices that encourage that effort is crucial because education may sometimes restrict young children's opportunities for engaging with nature, thus compounding their disconnection from the natural world (Ward, 2013). The following research questions are addressed: (1) What kinds of characters do children create during land art activity? (2) What choices do they make regarding materials during land art activity? Within these questions, we consider the possibilities of promoting preschoolers' contact with nature through land art.

Role of outdoor learning environments

Connecting with nature has several benefits, including increased cooperative play (Bell & Dymont, 2006), enhanced focus and attentional abilities (Wells, 2000), and the development of creativity and cognitive skills (Kellert, 2005). In addition, previous research (Aerila & Rönkkö 2023; Aerila et al., 2016; Bürgener & Barth, 2018; Lindfors et al., 2021) emphasizes the benefits of outdoor learning environments as they enhance experiential learning, develop more personal connections to learning, and increase engagement with nature. In Finnish ECE, outdoor learning spaces are already used quite widely and regularly; for many groups, visits to forests or urban parks are part of the weekly routine (Furu & Valkonen, 2021). However, these visits are rarely pedagogically planned (Furu & Valkonen, 2021), and their perspective is predominantly anthropocentric, which regards the world in terms of human focused values and experiences (Furu & Heilala, 2021). Playful, explorative, or dialogically framed learning experiences are sparse, and there is a lack of professional language regarding sustainability (Furu & Valkonen, 2021).

According to Needles (2020), learning environments should not only facilitate hands-on activities but also inspire creativity and encompass various forms of art such as writing and designing. Furthermore, the environment should contribute to the establishment of an inclusive and effective learning space (Brooks, 2010). Working or being in a garden enhances the senses, can both calm and stimulate, and activates creativity (Keckam, 2019). Improving the well-being of the environment necessitates treating people and the rest of the living world as integrated with one another and not merely in harmony with their surroundings (Berleant, 2002). Even in their early years, children possess an awareness and understanding of their environment (Spiteri et al. 2022), and creating art in an outdoor environment provides a platform for them to reflect on their experiences of beauty and awe of nature and the opportunity to interact with and incorporate aspects of nature into artwork (Green, 2017). In general, different inquiry-based learning activities link educational content to children's surroundings and effectively enhance their knowledge of nature's value and sustainability objectives (Spiteri et al., 2022).

Nature materials in arts-based education

From the perspective of ECE on the environment, a connection with nature and natural materials is considered essential. Natural materials not only satisfy basic human needs but also shape societal and cultural practices, and nature is known to play a significant role in the intellectual, emotional, social, spiritual, and physical growth of children (Kellert, 2005). In arts-based education, materials have the potential to inspire and cultivate a creative mindset (Needles, 2020), with young children in particular more actively engaged and invested in arts-based learning when they are encouraged to explore the possibilities of different materials (Lim, 2005). It is worth investigating how these factors manifest themselves in the work of pre-primary children, as they likely lack experience and preconceived notions and thus can freely experiment and create with materials.

In ECE, using natural materials for art is a common approach to environmental dimensions, alongside observing nature and using specific vocabulary for plants, birds, and animals (Furu & Valkonen, 2021) and promoting an attitude of being mindful of and careful with resources and learning to respect plants and animals (Furu & Heila, 2021). Natural materials provide opportunities for the kind of artistic engagement found in land art, which encourages a dialogue between artist and material. Working with both familiar and new materials can facilitate

children's understanding of the properties and potential of different materials, fostering creativity and critical thinking. (Bennett, 2007) The tangibility of materials can be engrossing and stimulating, and abundant material resources can inspire imagination (Alesina & Lupton, 2010; Clapp et al., 2016). Sometimes, encountering the environment can take on a new materialistic form (Bennett, 2007) that illustrates one's experiences of the environment and resembles a traditional verbal narrative but takes a more visual, tactile, or kinesthetic form (Aerila et al., 2019).

Art-based activities give children opportunities to create stories in modalities other than verbal expression and make individuals' environmental images, including unconscious ones, visible (Aerila et al., 2019). Relationships with nature can be promoted through artistic activity (Foster, 2017), and various visual, kinesthetic, and narrative methods have been shown to be effective in breaking away from plant blindness and promoting sensitivity to nature (Jose et al., 2019). Environmental sensitivity is defined as the ability to observe and care for the environment, and it is closely related to environmental aesthetics and education (Sepänmaa, 2017).

Much of human experience and knowing is expressed through sensory and emotional forms of knowing (de Bruin et al., 2018), and the arts make it possible to experience and make visible experiences that are not conveyed through rational knowledge (Foster, 2017). Art is a meaning-making process; through the creation of art, children represent and interpret their own experiences. Therefore, it is important to consider what type of art activities are appropriate for children (Green, 2017) and to find a balance between scaffolding children's learning and leaving ample room for individualized discovery (Wright, 2018).

Context of Study

The land art process investigated in this study was part of an intervention (Aerila & Rönkkö, 2023) carried out in an urban area of western Finland from the end of April to the end of May 2022. The intervention (Aerila & Rönkkö, 2023) was planned by two researchers in collaboration with the pre-primary teacher and implemented with the assistance of three student teachers (one specializing in early childhood education and two in craft, design, and technology education). An assistant who worked daily with the group was responsible for facilitating the use of tools and ensuring that all activities in the garden were conducted safely. The data collection was carried out over a period of three weeks in total, during which the children participated in the intervention for a total of eight days.

The context of the land art process was a garden near the school; it was established in 1897 and is situated in the city center. The garden is part of the University of Turku's Department of Teacher Education and is heavily used by individuals throughout the region (Ruokonen & Lepistö 2021). The garden area comprises a diverse collection of over 500 plant species. It is a busy part of the Rauma campus, accommodating teacher trainees and pupils from a number of schools (University of Turku). It is popular for both studying and relaxation. In previous generations, gardening was viewed as an essential skill for everyday life and nutrition, and the garden was considered an ideal location for learning these skills (Kokkonen & Kortelahti, 2018). The recommendations for implementing the study entail the utilization of outdoor spaces, encompassing natural environments such as forests, lakes, parks, or playgrounds, as highlighted by Chawla (2015). Additionally, the scope of these spaces extends to encompass specialized outdoor learning centers (Fuller et al., 2017), educational field trips (Henriksson, 2018), and rural locations (Kaasinen, 2019). Researchers are able to manage the public dimension of these spaces by selecting tranquil areas for instructional purposes. Both researchers and educators, along with the participating children, are encouraged to document the land art creations through photography. Depending on the study context, the art installations can either be left for public admiration or removed responsibly.

The intervention in this study was targeted at a pre-primary group from a Freinet school; it consisted of 19 children aged six or seven-years old (12 boys, nine girls). Freinet's pedagogy developed from the ideas and practices of Celestin Freinet (1859–1952). It is highly open and provides the implementing teacher with a wide range of choices and opportunities to further develop their pedagogical principles and practices (Aerila et al., 2010). In line with Freinet's pedagogy, methods of learning that prioritize the child and enable self-directed approaches necessitate learning environments that are adequate and adaptable. Moreover, the design of such learning environments must take into account outdoor spaces that are conducive to a variety of activities (Freinet, 1987). In accordance with the

principles of Freinet’s pedagogy, the children who were involved in the intervention had regularly visited the garden and had prior experience with activities such as planting seeds and harvesting crops. Nevertheless, it was observed that the children primarily used the garden for outdoor recreational pursuits and play.

The overall objective of the intervention was to explore the use of arts-based activities within a STEAM-based learning approach. Throughout the intervention, the children were introduced to the idea of nature and plants and participated in activities like borrowing books, planting seeds and monitoring their growth, building a robot, and reflecting on their learning experiences through storytelling. In addition, the intervention used a range of art-based activities, such as word art, drama, music, visual art, and crafts. Activities were held in both the classroom and the garden; each lasted between 60 and 120 minutes. The activities were structured into four phases: motivation, orientation, core assignment or activity, and reflection (see Figure 1; see Aerila & Rönkkö, [2023] for the structure of activities).

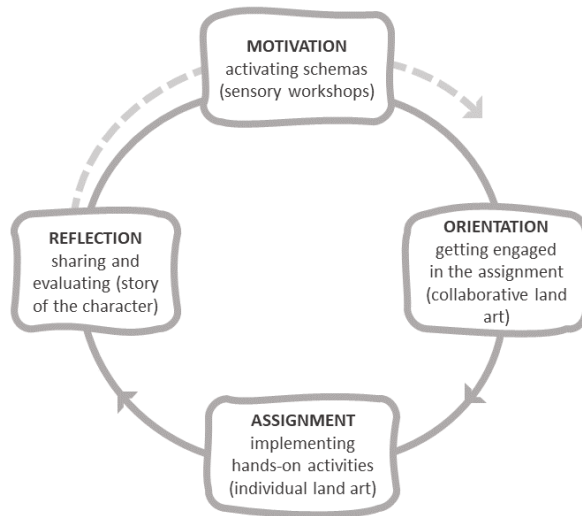


Figure 1: Implementation of the land art activity during the learning process.

One of the STEAM-learning process activities was the land art activity, which lasted for two hours. The motivation phase of the activity consisted of three sensory workshops: a scent-kinesthetic workshop provided opportunities to observe and identify a variety of scents and materials; in the visual workshop, children identified shapes and colors found in nature; finally, in the auditory workshop, they created a sound landscape for a story (Figure 2).



Figure 2: The intensive study of forms and colors in the garden.

The purpose of the workshop assignments in the orientation phase was to strengthen the children's multisensory observations. They were scaffolded on producing land art and created free-themed land art in small groups. These land art pieces were accompanied by storying, in which the children were asked to collaboratively related what they had created and imagine the meaning of the land art (see Figure 3).



Figure 3: Land art with leaves, flowers and spruces.

The core assignment was to individually create land art character. In the core assignment, the only limitations were that they were supposed to use only materials from nature, such as branches, cones, and leaves that had fallen to the ground, and material that was brought to them for the activity, such as flowers. All materials had to fit into a tray reserved for the land art piece. The reflection phase of this assignment was a shared reflection on the next

activity, which was designing a robot in the classroom based on a land art piece. This activity contained a drawing an outline of scanned images of land art pieces. Subsequently, the outlines were engraved on plywood using a laser machine and cut around the edges. A motor was attached to the plywood board by soldering. The children were given the opportunity to decorate plywood panels by painting or by adding natural materials collected from the garden. The robots were launched for the first time on the lawn of the garden. The reflection involved dictating a story about the character. Further, the children were not allowed to use any tools like scissors, glue, or coloring materials when creating the character, but they were allowed to work with natural materials in the way they wanted, such as tearing and cutting them.

Data and Data Analysis

The data consisted of photographs that documented the collaborative ($n = 3$) and individual ($n = 16$) land art projects undertaken by the children, as well as video recordings of the garden sessions, memos written by the two researchers, and stories dictated by the children in reflection phase. Video recordings, memos, and stories acted as supplementary data, with the photographs forming the main data. For the study, the characters' names are presented as the children named them in Finnish. When a name refers to something tangible, it has been translated, with both the Finnish name and its translation presented in Table 1. In the results section, these names are in their English form.

Table 1: The land art characters.

Child	Character's name	English version
C1	Keijumaija	Fairy Maija
C2	Goem	Goem
C3	Suomi Kukka	Finland Flower
C4	Lehtikettu	Leaf fox
C5	Kotka	Eagle
C6	Karvakamu	Hair pal
C7	Kauhu-ukko	Horror dude
C8	Pupu	Bunny
C9	Keijuapina	Fairy monkey
C10	Joulupukki	Santa
C11	Outo possu	Weird piggy
C12	Keijukisu	Fairy kitty
C13	Aava	Aava (Open like see)
C14	Luonnonsuojelija härkä	Nature Protector Bull
C15	Lintu	Bird
C16	Pupu	Bunny

Two researchers were present during the land art activity; they documented their observations by taking photographs and memos throughout the intervention. In the initial phase of analysis, the photographs were printed for both researchers to preserve the land art pieces and to facilitate the children's creation of stories about those characters.

A qualitative case study approach is employed (Yin, 2018) and involves a multimodal application of content analysis (Cohen et al., 2008) of the research data. Multimodal content analysis is based on semiotics, which argues that our actions are not arbitrary and reflect our understanding and learning. Since children may have trouble expressing their comprehension clearly and directly, using their creative productions and their actions can aid in understanding their learning and thinking (Bezemer et al., 2012).

First, the land art characters generated by the children underwent categorization based on idea behind the theme and execution. At this stage, the basis for character design was categorized (e.g., nature, imagination, combination). In the second phase of analysis, the land art pieces were scrutinized with an emphasis on their textures and the expression of diverse senses. Simultaneously, categorization was conducted on the materials used and how the character's details (facial features, limbs, and other distinctive attributes) were realized. Alongside this categorization process, the children's storytelling was also analyzed, and descriptions of the characters were made. Researchers' memos served as support for writing the descriptions. The first phase of analysis was conducted jointly by all researchers, while the second phase was carried out by the researchers individually. Those individual results were then integrated by the first author to form a shared understanding.

The study was conducted in accordance with the European Union's General Data Protection Regulation. Prior to collecting data, informed consent was obtained from the children and the guardians of all 19 participants. This included obtaining written consent for the use of the children's data for research purposes and ensuring that the participants and their guardians were fully informed about the study, the data being collected, and how those data would be used. In the context of data collection, participation in the study was voluntary, and children had the option to terminate their involvement at any point during the activity. The land art assignments constituted an integral component of the school's regular learning endeavors, so all children participated in these activities, regardless of their involvement in the study.

Findings

Diversity of characters created by children in land art activities

All the children created their own pieces of land art and assigned names to their land art characters (Table 1). The land art activity produced a diverse range of characters, with inspiration coming from different sources: nature itself, children's imaginations, and a fusion of nature and imagination. A few children's land art pieces ($n = 3$) were inspired by natural elements like animals or plants. For example, one child wanted to create an eagle, and the resulting piece of land art was brought to fruition through the use of a wide range of natural elements such as leaves, plant stems, and lichen (see Figure 4).



Figure 4: "Eagle," implemented by C5.

Some of the children's land art pieces ($n = 5$) were clearly conceived in their imaginations without explicit inspiration from the natural world. These pieces were characterized by the depiction of fictional creatures from popular culture or shapes that were original to each child's individual vision. "Horror Man" featured conifer cones as the character's eyes and a stone as its nose. In the creation of this artwork, the child incorporated leaves to enhance the details of the character's features, including the depiction of its hair and mouth (see Figure 5).



Figure 5: "Horror Man" by C7.

Most of the children's land art characters ($n = 8$) were a fusion of imagination and inspiration from nature. They used elements from the natural environment but added their own creative twists to create something unique. "Nature Protector Bull" comprised a bark-covered body, a single-leaf head, and various details crafted from branches (see Figure 6). One child wanted to emphasize the role of bulls as protectors of nature and bestowed on one such creature the title of "Nature Protector." It seems that land art evoked the children's passion for protecting the environment. According to the child's story, when Nature Protector is provoked, it can deploy countermeasures and even cause the world to explode if angered. It can climb and serves as a champion of environmentalism. Child (C14) describes Nature Protector like this:

"The character is powerful and has super armor. It rams with its horns. It can make antidotes if it gets irritated. If it gets angry, it starts to lash out and then the world explodes. It can climb and is a conservationist."



Figure 6: "Nature Protector Bull" by C14.

Children's choices of materials in land art activities

The analysis revealed that the children created cephalopod-like characters with heads, bodies, and arms (e.g., Figures 4 and 6). They used natural materials like leaves, sticks, branches, and flowers to create unique designs while experimenting with various shapes, sizes, colors, and textures. The resulting characters demonstrated the children's creativity and ability to bring their imaginations to life using only natural materials.

In the realm of land art, the creative process involved a form of communication with natural materials that provided inspiration and ideas for the children, while the characters imposed certain demands on the materials chosen. In this way, creating land art can be viewed as a dialogue between children, materials, and characters brought to life through the art form. The use of natural materials such as leaves, twigs, stems of plants, and grass to create unique characters encouraged the children to explore and appreciate the beauty of nature. In this study, the observation that certain natural materials were particularly well suited for specific character features is noteworthy.



Figure 7: Bird (C15).

Figure 7 shows "Bird." This child's use of natural materials to create a bird with anatomically correct legs demonstrates a sophisticated understanding of both the physical attributes of birds and the properties of the materials used. The body of the bird is composed of pine cone, which add a distinctive texture to the piece. The head of the bird, meanwhile, is made of bark, which fits in seamlessly with the rest of the design. To add to the realism of the artwork, the child has used moss to create the bird's feathers, lending it an earthy, organic feel. The eyes are made of cowberry leaves. The careful arrangement of the materials reflects an attention to detail and a commitment to producing a realistic representation of the bird. However, the child's description departs from the naturalism of the land art: "It is a bird that is attending a party and drinking juice. It is playful, watches TV, specifically a Mickey Mouse movie, and eats potato chips while drinking Coca-Cola" (C15). Based on these details, it appears that the character is living a human-like life that includes entertainment. The story continues:

"Bird goes to buy a cupcake and a hamburger. Then, it spins a wheel of fortune and gets the best number, which is one. It also puts on a gooseberry cap. Bird goes to play with the birds because it is a bird party. Dogs and cats also come to the party. The child likes them and plays with everyone. Then, Bird buys cupcakes for everyone and they all eat them." (C15)

The use of natural materials in character design allowed the children to create characters with recognizable animal features, such as limbs, faces, and expressions, despite the unconventional medium. By carefully selecting and

arranging natural materials, the children were able to craft intricate details, bringing their characters to life in a way that was both unique and memorable. For instance, leaves with fine, stringy fibers or fringed edges proved to be ideal for crafting hair or tufts of hair for the characters, as the fibers could be arranged to create a realistic, textured effect. Waxy leaves served as the skin or hide of the characters and were also used to shape the body or shield. Small leaves, dry berries, and pebbles were the primary choices for eyes. Similarly, grass with fluffy textures were used to design ears, giving the characters a distinctive and quite charming appearance.



Figure 8: "Bunny" (C16).

The child's artistic creation, as depicted in Figure 8, is a character named "Bunny":

"The character is Ella. Ella lives in a house, a golden house. Mashed potatoes are a favorite food. The golden house is in the forest. Fox, bear, snake, squirrel, mouse, owl, frog, and dog are Ella's friends. Ella is adventuring in the forest with her friends. Found seven new friends in the forest. Friends play together in the forest. Then they eat and go swimming and go home, and then sleep. Ella was born in Germany and knows German. Ella was born in the forest. Ella became a veterinarian when she grew up."

Ella's body was crafted using the wax-like leaves of the bergenia plant, while the head was formed from an oval leaf; even her feet were made using leaves, complementing the rest of the design. To add an extra touch of realism, the ears were carefully crafted from a plant stem with accompanying leaves, adding to the character's overall appearance. The tail - a crucial aspect of any bunny - was meticulously designed using lichen to create a fluffy and tactile texture that adds to the sensory experience.

Discussion

The results showed that children created imaginative characters, each of which was unique. They were able to use natural materials for their needs, selecting colors and shapes to highlight each character's particular features. The garden served as a significant location for outdoor learning by providing a space for children to create land art and explore nature. The shapes of natural materials served either as building blocks for the characters or helped them realize the characters they imagined. In this study, most children had an imaginary character in mind and chose materials accordingly. Multiple sensory experiences were meaningful in choosing materials: their visual form (length, shape, colors); their feel to the fingers (softness, hardness, roughness); and the kinesthetic experience of moving the materials. The land art assignment helped children enrich their understanding of the environment and the human relationship with it through active creation.

The learning process presented in this study serves as an example of how children engage in using natural materials if they are given the opportunity to exercise their creativity (for creativity and nature, see Almers et al., 2021). The results also emphasize that the availability of natural materials facilitates a direct interaction with the natural world that can be enhanced with diverse hands-on activities like land art. The results of this study accord with previous research (e.g., Tuuling et al., 2019) in suggesting that the use of natural materials can stimulate creative capacity in children.

Experiential and multisensory knowledge can provide children with opportunities for personal interpretation, thereby fostering their relationship with matter (Wilson, 2012). By engaging with materials through various sensory channels, children can gain a deeper understanding of their properties and potential uses and enhance their creativity. As such, providing children with opportunities for experiential and multisensory learning can have a significant impact on their relationship with the environment and the natural world, fostering a sense of stewardship toward natural resources.

In general, children who attend childcare centers with outdoor spaces can interact with nature and explore green spaces in a safe and convenient way (Chawla et al., 2014). The dynamic interaction between children and nature materials illustrated in this study facilitates a space for learning and exploration, enabling children to experiment with diverse materials and explore the unique properties of each of the many materials at hand. In the present study, children were engaged in garden activities, and their environmental investigations provided a platform for the expression of individual voices, and creativity. Through land art, a child may be expressing a desire to promote environmental conservation and sustainability and a belief in the transformative power of individual action. In the future, it is crucial to place a greater emphasis on making nature experiences meaningful for children and structuring them pedagogically.

Facilitating arts-based education provides a platform for children to interact socially and discuss their perspectives on significant issues like sustainable futures (Green, 2017). In general, art-making activities are considered useful and creative approaches for exploring and expressing understandings of the natural world and for assisting engagement with the local natural environment. Arts-based exploration provides learners with additional ways of knowing - cognitive, affective and kinesthetic - and understanding the environment (Ward, 2013). The importance of play in a child's growth and its potential for educational objectives in promoting well-being and supporting the learning process are acknowledged. The techniques utilized and the educational settings offered should encourage children's inquisitiveness and enthusiasm to investigate, test, and participate in practical, hands-on activities (Yliverronen et al., 2023). This study revealed that playful activities were intriguing to children and nourished their creativity. We demonstrated how natural materials provide a tangible link between children, the environment, artistic creation, and stories. Land art is also a way to engage with one's immediate surroundings and life, as children can strengthen their relationship with familiar habitats by creating their own characters. Creating land art is a concrete material exploration, and it is worth further investigating the relationship between children and materials as part of arts-based environmental and sustainable education in ECEC.

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Everyone Has a Piece of the Story: A Community of Practice Approach for Supporting Early Childhood Educators' Capacity for Fostering Empathy in Young Children through Nature-Based Early Learning

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ABSTRACT

Empathy can be a powerful means for positive social change and for caring action toward wildlife and nature. Thus, there is a need for interventions that build the capacity of early childhood educators to support empathy development in young children, given the critical developmental period of early childhood and the relevance of empathy to social-emotional learning, which is an emphasis in early childhood education. This article describes a project that used a Community of Practice (CoP) approach to engage a cohort of 15 regional early childhood professionals in the co-creation of empathy practices that are deepened through a Two Worlds approach. We also offer the results of our shared learning, including the co-constructed practices for infusing empathy into nature-based early learning and the impact of participation, as well as our reflection on the use of a CoP approach to build organizational and community capacity for supporting empathy.

Keywords: empathy, community of practice, capacity-building

Empathy is gaining traction within conservation circles as a motivator of conservation behavior (Khalil et al., 2020). A network of zoos and aquariums, *Advancing Conservation through Empathy (ACE) for Wildlife*, facilitated by Woodland Park Zoo (Seattle, Washington, USA), is leading efforts to learn how empathy for wildlife in zoos and aquariums can be a catalyst for conservation action for wildlife, ecosystems, and the planet. In conservation contexts, empathy is defined as a stimulated emotional state that draws from the ability to perceive, understand, and care about the experiences or perspectives of another person or animal (Wharton et al., 2019). Empathy with animals can activate empathy more broadly toward the natural world (Sevillano et al., 2007). This dispositional empathy with nature predicts biospheric concern more broadly and correlates with environmental behaviors (Tam, 2013). Gosling and Williams (2010) propose connectedness to nature enhances dispositional empathy with nature, and empathy likely mediates the relationship between nature connectedness and conservation behavior. While more research is needed, Tam (2013) emphasizes the importance of empathy in our efforts to nurture humans' relationship with nature and motivate conservation behavior. In addition to its links to conservation behavior, empathy is also integral to achieving a more compassionate and just society (Zaki, 2019). Not only is empathy part of a broader category of prosocial actions that promote the collective good, but it is also surfacing as a pathway toward social justice and as a key strategy for raising antiracist children (Kendi, 2022).

Empathy In Early Childhood

Due to the high plasticity of young children's brains, early childhood is a sensitive developmental period for nurturing empathy. Positive environments and early interactions with people and the world, as well as secure attachment relationships with caregivers, can provide a solid foundation for empathy that can be reinforced as children grow (Zahn-Waxler, 1992). Empathy also can be supported through instruction, modeling, and practice with feedback (Teding van Berkhout et al., 2016), particularly when placed within the context of a social-emotional learning curriculum (Malti et al., 2016). Social-emotional skill-building interventions tend to be most effective when they are developmentally responsive, begin early, and include repeated opportunities to practice these skills beyond the curriculum into authentic scenarios (Durlak, 2011).

Play-based interventions also can be effective in helping children develop a range of social-emotional skills; through the repeated social interactions of peer play, children develop abilities to relate to the world around them and interact well with others (Fisher, 1992). The impact of nature play on social-emotional learning and prosocial behavior also has been studied across disciplines, with a range of outcomes including positive peer play behaviors, cooperation, teamwork, sharing, and helping behaviors (Bal & Kaya, 2020; Brussoni et al., 2017; Burgess & Ernst, 2020; Fyfe-Johnson et al, 2021; Sandseter et al., 2023). This impact of nature play on social-emotional competencies is perhaps unsurprising, given the dynamic aspect of nature play that affords problem-solving, taking risks, cooperation and helping behaviors, and constructing new meanings (Bundy et al., 2009; Chawla et al., 2014). Recently, Ernst et al. (2022) found a positive impact of nature preschool on empathic behavioral intentions in the context of humans, as well as on cognitive and affective empathy with wildlife. With the child-directed approach of nature preschool situated within natural spaces for children to roam and explore, there tends to be more child autonomy in nature preschools than in conventional preschools (Sobel, 2016) and thus, opportunities for children to assist each other as they encounter challenging activities, provide comfort to each other when they are upset, and help each other as they play and explore, rather than relying on an adult for help (Alme, et al., 2021).

Professional Learning Communities and Communities of Practice

Given the research convergence on the developmental importance of the first five years and research suggesting the quality of children's early experiences are foundational to their long-term social-emotional learning and academic success (Heckman, 2011; Institute of Medicine & National Research Council, 2015), there has been an emphasis bolstering early childhood educators' competencies for engaging in sensitive and developmentally-supportive responsive interactions with children in their care. One area showing promise is strengthening educators' skills for and use of reflective practice, as it appears to promote practices that support the social development of young children (Virmani et al., 2020). Reflective practice in early childhood education is broadly associated with high-quality education and care (Sellars, 2017). Collaborative reflection with other early childhood educators is also positively associated with the quality of early childhood teaching, as it provides educators, who are often relatively isolated from one another, opportunities to transform the lens through which they interpret, evaluate, and discuss their practices (Siry & Martin, 2014).

One approach conducive to collaborative reflection is professional learning communities, which are communities where teachers and administrators "continuously seek and share learning, and act on their learning" toward "enhancing their effectiveness as professionals for the students' benefit" (Hord, 1997, p. 1). In professional learning communities, there is reflection to deconstruct knowledge, action to reconstruct knowledge, and collaboration with peers to co-construct knowledge (Stoll et al., 2006). Professional learning communities foster an organizational culture that values collaboration that is genuine, inclusive, and ongoing toward deep reflection to improve practice (Seashore et al., 2003).

Another professional learning approach conducive to fostering reflective practice and effective in increasing practitioner confidence and capacity is the community of practice (CoP) approach (Buyse, et al. 2003). Wenger, McDermott & Snyder (2002) define a CoP as a "group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (p.4). A CoP shares many of the characteristics associated with professional learning communities; however, the scope of

a CoP tends to be narrower, and there tends to be a more-defined membership with a facilitator who encourages participation, supports the building of knowledge, and captures success stories (Nussbaum-Beach & Ritter Hall, 2011). Also, CoPs tend to be more collaborative in nature and build upon the expertise and goals of the participants. Like professional learning communities, CoPs vary in size and life span; some are located within an organization, but they can also span across organizations (Blankenship & Ruona, 2007). CoPs have a theory base that draws from situated cognition (learning occurs in a situated activity that has social, cultural, and physical contexts), social learning (observation and modeling play a primary role in how and why people learn), and knowledge management theory (knowledge is accessed, created and shared within community) (Blankenship & Ruona, 2007). In essence, CoPs involve situated learning that is socially and culturally constructed.

Not only do CoPs encourage collaboration and knowledge construction (Buysse, Sparkman, & Weket, 2003), but they also have significant potential for improving teaching and learning (Sherer et al., 2003). Further, in CoPs, there is a focus on communities and what it means to learn as a function of being a part of a community. While growth in knowledge and skills are relevant, there is an emphasis on developing an identity as a member of a community; becoming knowledgeable and skillful and developing that identity is part of the same process, with the former motivating, shaping, and giving meaning to the latter (Lave, 1991). As such, the benchmark for evaluating the effectiveness of a CoP is the application, rather than the retention of, knowledge.

PROGRAM DESCRIPTION

Rationale

Considering the significance of empathy in prosocial and conservation behavioral contexts and the time-sensitive window of early childhood for nurturing empathy in children, we designed and facilitated an empathy-focused CoP for early childhood educators. We selected the CoP approach, as it would allow for early childhood educators across various settings to deeply engage in discussion and critical reflection to deconstruct their current empathy strategies and collaborate with peers to co-construct an infused empathy approach for supporting empathy development in young children. Further, our prior empathy work (Ernst & Budnik, 2022; Ernst, Curran, & Budnick, 2022) explored empathy in the context of Western knowledge, and we recognized a need to deepen our empathy practices through engagement with Indigenous peoples and perspectives, particularly given our location on the contemporary and ancestral homeland of the Anishinaabe, Dakota, Northern Cheyenne, and other native peoples.

While not named specifically as empathy, throughout many Indigenous traditions is an abiding emphasis on the connection of all beings, which calls for deep respect, reciprocity, and care (Kapyrka & Dockstator, 2012). This deep sense of connection offers important insight into empathy development strategies. For example, Dorlando's (2011) study found that Indigenous elders identified empathy as a core component of communal coping and survival and defined empathy as a "relational and dynamic process of sharing feelings with others and acting compassionately for the good of a community" (p.43). From an Indigenous perspective, empathy then is not an individual trait but arises from relationships, from community (Dorlando, 2011). Further, a deep understanding of the interconnection of all beings is at the heart of many Indigenous perspectives, and there is "an inherent responsibility attached to this way of thinking about oneself in relation to the entire cosmos, grounded in relationships, and how one relates to all of Creation" (Kapyrka & Dockstator, 2012). This resonates with the Anishinaabe concept of *Indinawemaaganidog* (all our relations), which speaks to the deep interconnection between humans and the more-than-human world (McGinnis et al., 2019).

Two Worlds Approach

A "Two Worlds" approach was intentionally chosen to expand our collective understanding of practices for fostering empathy at the intersection of Indigenous and Western knowledge (Kapyrka & Dockstator, 2012). A Two Worlds approach acknowledges the differences between the knowledge systems of both Indigenous and Western perspectives, and rather than aiming to synthesize them, affirms their differences and centers each in their own integrity (Kapyrka & Dockstator, 2012). (See Appendix A for more information). Our CoP was co-facilitated by the second two authors. The second author had studied empathy prior from an academic perspective and had

experience with group facilitation in the context of community organizing and social change movements. The third author is an Anishinaabe elder and lifelong educator, with whom the project organizer (first author) had an established relationship. Both co-facilitators, along with the project organizer, co-created the CoP process from the beginning of the project, from the initial grant proposal to the co-authoring of this article.

With permission, we drew from *Natural Curiosity 2nd Edition: The Importance of Indigenous Perspectives in Children's Environmental Inquiry* text (2017) and professional learning program (developed at the Ontario Institute for Studies in Education, University of Toronto). The second edition of this professional learning resource uses a four-branch environmental inquiry framework deepened by Indigenous perspectives. While focused on environmental inquiry and not specifically on empathy, the *Natural Curiosity* (2017) professional learning program is grounded in the importance of considering environmental inquiry through an Indigenous lens and through local Indigenous perspectives. Further, *Natural Curiosity* (2017) is framed as a living process toward reconciling relationships, not as a static or stand-alone product. As such, it was a fitting resource to ground and guide our efforts to deepen our understanding of empathy. Rooted in what is already known from Western science regarding fostering empathy and guided by our Indigenous co-facilitator and the *Natural Curiosity* resource, the CoP has allowed us the opportunity to work toward a co-created, deepened approach to infusing empathy in early learning settings. As Indigenous cultures deeply value and practice oral traditions, we knew engagement with Indigenous perspectives was needed beyond the *Natural Curiosity* (2017) text. The Indigenous co-facilitator invited four guest speakers to join our sessions to share their experiences and stories. It was then the role of participants to honor the generosity of the stories shared and draw connections between the guest speakers' offerings and our work to deepen our understanding of empathy.

Community of Practice Design & Aims

We (the co-facilitators and project organizer) invited participation in the CoP through our local, grassroots collaborative of nature-based educators and caregivers. Fifteen early childhood educators expressed interest by submitting a brief online application form. These participants received the *Natural Curiosity* (2017) text, a reflection journal, and a stipend of \$1000 for their participation; we felt a stipend was an appropriate way to honor the participants' time as well as their role as professionals who have much to contribute and from whom we have much to learn. The participants were at varying career stages (from pre-service to very experienced educators) and were from a range of settings (private nature preschools, public preschool and Head Start programs, nonformal education settings, and family in-home providers). Among the participants were non-Indigenous and Indigenous educators, with varying prior experience with cross-cultural learning; yet all shared an interest in empathy and an enthusiasm for engaging with this topic from a Two-Worlds approach.

Our CoP met seven times over the course of the 2022-2023 school year (see the last section of Appendix A for a summary of our sessions). Each session began with a shared meal to build community and as a reflection of our grounding in a Two Worlds approach and our desire to honor Indigenous practices of meal-sharing. Our first session focused on co-creating our CoP. We opened with a land acknowledgment, and we spent time getting to know one another better and orienting ourselves to the work at hand. We introduced participants to the project's aims, which were as follows:

1. Early childhood professionals will have increased and deepened knowledge regarding effective practices for supporting empathy, particularly in the context of early childhood.
2. Early childhood professionals will infuse the co-constructed empathy practices in their early learning programming at their respective settings (zoos, aquariums, preschools, early learning centers, etc.).
3. The regional nature-based early learning community will have strengthened organizational and community capacity for fostering empathy through increased knowledge that has been deepened through a Two Worlds approach and through a collaborative culture of continuous learning and improvement.

We also collectively developed a community agreement to guide our interactions together. As part of this process, we brought to the group the idea of including a land acknowledgment at the beginning of each session, as well as an opening offering, to invite participants into shared facilitation of the sessions. Participants welcomed the idea and took turns in these roles; participants also suggested adding an intentional closing for each session, with that role rotating as well.

Our second through fifth sessions were guided by the Indigenous lenses from the *Natural Curiosity* (2017) framework (see the last section of Appendix A for more details). During these sessions, a combination of guest speakers, small and large group discussion, individual reflection and journaling, and storytelling were used to integrate new perspectives and information with past knowledge and experience toward knowledge co-construction regarding what empathy means and how we can nurture it in young children. Participants presented guest speakers with handmade notes and gifts, following the tradition of Indigenous gift-giving to show appreciation for knowledge exchanged in the spirit of reciprocity (McLay, 2020). Following each session, the collective learning, emerging insights, and co-created knowledge were synthesized and shared back with the participants for their review and building upon in the subsequent sessions.

The sixth session focused on knowledge synthesis; the empathy narrative that was being built along the way was reviewed in its entirety, with the discussion focused on refining it and exploring ways to share what we had learned. Our seventh and final session was a potluck celebrating our learning and time together. Participants had the opportunity to share a meal together, review the final version of the empathy narrative and model that had been co-constructed throughout the course of our CoP, and participate in a talking circle, sharing additional stories, experiences, or impacts of participation. The final version of the empathy narrative (see Appendix B) is organized into six sections: what empathy means; its importance; grounding concepts; strategies to support it; challenges; and stories/examples. Throughout the narrative, we have included reflection questions to guide readers' thinking and participate in the co-creation of knowledge. This learning is offered in the spirit of an Indigenous view of knowledge, wherein knowledge flows without end: it is not owned, but shaped by community (Anderson et al., 2017).

OUTCOMES

Our project evaluation focused on these evaluation questions: Did participation in the CoP expand and deepen participants' understanding of empathy and practices for supporting it? Do educators intend to implement these practices? Does the regional early childhood community have a strengthened capacity for supporting empathy? We used a short "exit reflection" feedback-gathering mechanism during each CoP session to gather data toward ensuring we were carrying out the CoP well and that a Two Worlds approach was being used; this feedback was reviewed in our planning of subsequent sessions. The exit reflection also served as a data source that was part of the knowledge construction aspect of our work, which then allowed us to track the deepening perspectives regarding what empathy is and how it can be fostered. In addition to the exit reflection, we used an end-of-project participant questionnaire, and the responses from that questionnaire were used alongside participants' responses during the talking circle at our final session together to finalize the empathy narrative (Appendix B). We also used a matrix for documenting our reflections regarding what we were learning about the CoP as a method for knowledge co-construction and for building capacity for fostering empathy. We used this matrix after each CoP session to stay on track, review progress, and aid in the planning of the subsequent sessions.

Increased and Deepened Knowledge

One of the intended outcomes of this project was to increase and deepen early childhood professionals' knowledge regarding empathy and effective practices for supporting empathy, particularly in the context of early childhood. At the beginning of the CoP and again at the end, we asked participants to list five words or phrases they think of when they think of empathy. Comparison of these responses indicated a deepening of knowledge and reflected the influence of our engagement with Indigenous perspectives. For example, the following descriptors were uniquely offered among the after-participation responses: reciprocity, community, deep gratitude, presence, humanity, noticing, and slow responding.

Our post-questionnaire responses further indicated this outcome of increased and deepened knowledge was met. Participants were asked how their understanding of empathy and ways of nurturing it in young children deepened through participation. Their specific responses were wonderfully rich! Participants indicated a shift in understanding regarding the meaning of empathy, as well as deepened valuing of empathy in their professional and personal lives. Participants commented on evolutions in their understanding of empathy, with greater awareness of the reciprocal cyclical nature of empathy (where sometimes we give it, and sometimes we need to receive it), as well as an awareness of presence, gratitude, and humility as what allows empathy to come forth. Another participant expressed an expanded understanding of the connection between empathy and self-regulation (both for oneself and with children). Others reflected on the broadening of their scope of understanding of empathy, in part from a recognition of how empathy has been central to Indigenous cultures since time immemorial and connecting empathy with reciprocity, alongside expanded recognition of empathy extending beyond human contexts to the more-than-human world. Participants expressed deepened understanding of the connections among our ancestors, to Earth and sky, to animals and humans, and that empathy is what connects us to the past, present, and future. Participants also expressed new understandings of how empathy and connectedness to nature are related and mutually reinforcing, as well as how empathy fosters community and is both supported by and flows from a sense of place.

Regarding strategies for fostering empathy in young children, participants also expressed expanded understandings, including strategies such as the importance of creating space for stories, honoring historical trauma, supporting a connection to place, and a deep understanding of our relationship with all things in that place, supporting a culture of reciprocity, and heart-centered learning. Here is one illustration of that deepened understanding of empathy strategies:

I would say that over time in the CoP - the curriculum, this community, the stories - it has given me reason to think more of the beings that we're sharing our space with, within our forest, and how to really bring that into these little ones' lives. To give the spirits of our forest - the rocks, the trees, the mosses - emotions and feelings to take on human characteristics and to respect the space that they occupy. In doing so, it's been really fun to see the children become friends with these beings and to see those connections form. To see them share stories with the bugs and the flowers. They've really appreciated the canopy under the Maples this year, and the ferns as they have come up. After the long, cold, white winter, it just glows green in The Forest. Just the other day, the children were talking about how walking into The Forest felt like home, with 'the carpet and the roof.' There have been beautiful moments that we have been experiencing and appreciating together now through this new lens that the CoP has taught me to pause.

Another deepened understanding was reflected in their greater recognition of the time involved for empathy to take root. As expressed by one participant:

But one of the children in particular, there was a softness to him really coming out, particularly during the last month of school. And even if it was just the last month of school, we were seeing evidence of the hard work that we were putting in. And it was the reminder that a child's ability to show empathy doesn't happen overnight, and it might not even happen during our time with them. This realization was really helpful, because before, I felt a lot of pressure like, oh my gosh, why isn't what I'm saying sinking through... but realizing it doesn't happen overnight!

Not only was there deepened knowledge about empathy and strategies for fostering it, but there also was an expansion of participants' own empathy - dispositional and situational. Participants expressed growth, especially in their own empathy toward animals and nature, and particularly with those more-than-human relatives in participants' respective places.

Application of Knowledge and Strategies

A second intended project outcome was for early childhood professionals to infuse the co-constructed empathy practices in their early learning programming at their respective settings. The post-questionnaire included a

question that asked participants to share how they have been implementing what they have learned throughout their CoP participation. Additionally, during the final CoP session, participants were invited to share responses to this question through a talking circle. As an illustration of one of those responses, here is what one participant expressed:

It's just enlivened every part of my teaching practice. And like so many of you are sharing, also the internalizing of it. This CoP has shifted my frameworks, in my teaching practice, for sure, but even in my relationships with my family, and with my friends, and with my relationship with nature, and my understanding of the non-human relatives that I'm with every day.

Participants indicated a range of ways they were implementing what they were learning, including modeling their own relationship with nature to the children in their care and using lines of inquiry to help children stop and consider the feelings and needs of beings within their natural space to help them recognize that each being, whether a child, worm, or leaf, has purpose and value. There seemed to be a shift in participants' framing of care and concern for nature from one of stewardship to one of empathy; this seems reflective of their deepened understanding from engaging with Indigenous perspectives and their greater recognition of connections with nature, rather than superiority over nature that stewardship sometimes implies. Participants also indicated that the CoP strengthened and affirmed their instincts and gave them agency as well as deepened understanding and framing to both support teaching practices they were already using and to implement new strategies and practices.

Other examples included communicating with children in ways that were richer in emotional vocabulary with a focus on understanding children (who they are, their behavior, and the context at hand), and intentionally aiming to deepen children's sense of community and belonging within their school toward creating an environment where empathy occurs naturally because of their deep connection with and care for one another. Another response was showing children how the land and our more-than-human relatives share empathy with us and using that as a model for our expressions of empathy toward other human and more-than-human beings. Other participants referenced using the "Indigenous pause" (or the moments to sit and wait, to listen, to fully understand, and engage) introduced to the CoP by our Indigenous co-facilitator and working against the inclination to hurry and solve a problem but instead just be together with the child.

Strengthened Organizational and Community Capacity

The third intended outcome for the project was that the regional community would have strengthened organizational and community capacity for fostering empathy with wildlife through increased knowledge that has been deepened and a collaborative culture of continuous learning and improvement. Based on the post-questionnaire responses, participants were in unanimous agreement that their individual capacity for supporting children's empathy was strengthened through participation. Additionally, they were asked how they saw our CoP work as strengthening organization and community capacity for supporting empathy. Participants suggested strengthened capacity at a community level through a ripple effect; by showing empathy and adjusting actions to make way for more empathy, and with intentional strategies to bring empathy forward and support its development in young children, there is a rippling outward. As one participant expressed,

I really appreciated these multiple touch points once a month because you have all these great moments where you connect. It feels authentic. And you're just rejuvenated. And it's been so nice to come back to this crew once a month, because it keeps adding oxygen to this movement within ourselves, within this group, and within what we're putting into the community. And I have really valued being able to come back to this time and again because we just have so many valuable things to share. We've been learning from each other, we're folding it into our own practices.

As participants returned to their work settings after CoP sessions, they shared what they were learning with colleagues. One participant expressed that the new ideas she brought back to the workplace from the CoP prompted discussions among colleagues and led to working together on a collective empathy-building approach with children in their care. One participant indicated she would be guiding a professional learning opportunity for teachers next

year at her site, and she planned to implement elements of this CoP experience with them. Another participant commented on how rarely they had time to actually be together with other staff members from their same organization to discuss, reflect, and learn together; through the CoP participation, they felt their individual efforts to support empathy were strengthened and became more effective through becoming a collective effort that was informed by that shared time of learning together.

The following is an example that illustrates the strengthening of individual capacity alongside the rippling outward to strengthening organizational capacity:

In the winter, we're kind of the only ones in the woods, and it's easy to yell and be super loud. And it's just us, and it just echoes down the hillside. But as the leaves started to come in, and the birds started to come in, the children's volume started to bother me, and I'm very sound sensitive. From our CoP time together, I started realizing that the other beings in the forest are probably bothered by their sound too. And so I started talking to the children about the work that the birds have to do and the way that they need to communicate with each other, and that this is their forest as much as our forest that we play in. And so it's been really neat to watch how they've responded to this idea that the bird calls need space, too. So I started sharing this with my co-teachers, and they started sharing this with the children. And today, my co-teacher shared with me about being in the white pines playing. When the children arrived into the pines, they were so excited to be there and were very loud. My co-teacher brought everyone together and said, "I can't hear the Ovenbird anymore. When it was here, it was calling out Teacher, Teacher, Teacher, and I love to hear it because it's singing my work, and I can't hear it; it stopped talking." And the children started getting quieter and quieter. And then they could hear the bird call again!

REFLECTION ON COMMUNITIES OF PRACTICE FOR CAPACITY-BUILDING

We think the project was successful in building individual and community capacity due to the very two strategies that we intentionally chose and employed: the CoP and the Two Worlds approaches. We found the CoP strategy worked very well for engaging participants, not as recipients of knowledge, but as co-creators of knowledge engaged in an emergent learning process, and it was this very co-construction aspect that seemed so meaningful and effective. Participants were very vested, willing, and eager to engage, and they took the process seriously and became more and more comfortable with and confident in the emergent learning process. One participant expressed it in this way:

When we got started in the CoP, it felt kind of like this slow trickle of getting to know each other and trying to share knowledge. And then, as we met, month after month, that flow of knowledge picked up steam and got faster and stronger. And as it did, our learning and the stories that we were hearing started to connect in my teaching space - one of the ideas we had read and talked about, that Indigenous perspectives weren't so linear, but instead had more of a compounding reality that contains so many things all at once. And now, I'm finding that the edges of what I am trying to do in my teaching are expanding in that same way, and I'm starting to feel much more comfortable with the idea that I don't know what's in all those directions.

Participants embraced their role of making connections among the readings, speakers, and our focus on co-constructing knowledge about fostering empathy. Rather than passively receiving information, they were active in their listening, reflecting, sense-making, and sharing. We would bring forward to each session the co-constructed knowledge from the prior session, and participants would weigh in on that knowledge and continue to shape it together, resulting in the empathy narrative and model (see Appendix). They built off each other's thinking, and questions arose that we wouldn't have anticipated or have been able to structure in advance. The CoP intentionally implemented by the co-facilitators elicited reflections and ideas that seemed unlikely to have arisen in a more typical professional development setting. The CoP also was very conducive to stories; storytelling happened naturally in a learning environment that intentionally valued and invited knowledge co-construction. Through the CoP, participants were connecting their own stories to the learning at hand, as well as lifting up one another's stories and

lived experience as significant. The CoP's eliciting of stories, experiences, and knowledge-sharing seems to reflect systems-thinking and its properties of emergence and synthesis. The knowledge and community that were forming were truly greater than the sum of their parts. As one participant expressed,

Everything we created in terms of defining empathy, grounding concepts, and strategies was created in collaboration; the ideas belong to all of us together because we all contributed. It was never in doubt that everyone's perspective was important and part of the bigger picture. We got to know one another through stories and connections to the stories of others, and building meaningful relationships allowed us to learn so much from each other.

This relates to the other aspect that we think made the CoP such a successful strategy - it built community. The CoP approach was conducive to fostering trust, connection, and relationships. While there was an overall natural emergence of this, it was also very intentionally invited, as it was set in a context of intentionally creating a group culture that valued the voices of all and lifted up one another's stories and lived experiences as significant. The CoP made space for vulnerability, particularly as stories were shared and connections between empathy and historical trauma were made. This community-building also fostered courage to try new strategies:

I think after being with this group over the last few months, I feel like I am trying new things and saying different words, and viewing things differently. And I think that has come from being in this group. For example, we built our first little fire. And I've been teaching for 17 years!- And it was our first little fire, and it was little, but it was a fire. And it was beautiful. And we had family - we invited families into the forest and just watching the interactions and the different comfort levels of families in the forest and it was the buggiest day we've had and we still had families in the forest enjoying it. I'm reflecting a lot about this. There's a lot going on that's hard for me to articulate in this moment, but I would say courage and peacefulness are words that come to mind.

Another participant expressed, "Being in this circle together, I can kind of start taking some steps, and I am starting to feel more confident in understanding that teaching how to live in the good way is for all of us to be exploring."

Particularly when their work as early childhood professionals can be isolating and quite challenging, the relationships that formed and the support they felt were very impactful, which contributed to the effectiveness of the CoP. Participants indicated being able to feel that support from the CoP community beyond the sessions, and that they were mindful of all their collective wisdom and drew from that in the days and weeks between the CoP sessions. For example, one participant expressed, "Every time we meet, I feel like I absorb so much rich and useful information. It lingers with me for many days after our meetings and helps me implement it at my job." There seemed almost a thirst for those relationships, and the CoP seemed to serve as a way to refill and restore their internal reserves of energy, motivation, and inspiration. The following are illustrations of the impact of the support participants felt through their CoP participation:

I've really appreciated having other people that understand your work and having other people that have those challenging days, or those hardships or have those desires to connect kids to the earth but don't exactly know how to in the world that we're living. And so I've just really been grateful for this community, not even like a list of specifically this, and that and that; it's just connecting and talking, and having the space just somehow makes me a better person every time I'm here.

The support that I felt from everyone ... being in the forest, on my own, most days, every day for 10 years with these little humans.... to really share with you your experiences. And like [another participant] had mentioned, just feeling that connection to each other... sometimes it can feel isolating. And it's been fun to know of the work that you all are doing. And it's inspiring to be a part of your community.

At first, it was just new to all of us, and we were new to each other. But now I can feel all of your wisdom with me when I'm alone. And it's just the beginning of the journey...being with all of you gives me these hints of what it feels like to build meaning and knowledge together. So now when I am alone, and I'm asking all these questions or wondering what's happening or working with a child that needs something that I'm not sure I can offer, I can feel this like flow of your presence with me. And so realizing really we're so deeply not alone. We have each other, but we also get to be all connected and supported by nature who has always supported us. It's been such a gift to be together.

In sum, the CoP afforded simultaneous knowledge co-creation, community-building, and deepened understanding. One participant reflected,

I have never experienced something like this, and I am very grateful for the intentionality in honoring each person's voice and thoughts/ideas. From the start, it was very inclusive and welcoming. A safe space was created for unlearning and learning new ways of knowing so that we could bring them into our own practices as educators. This wouldn't have been possible without the co-construction of knowledge.

Another stated, "This kind of work brings people together, acknowledges community and the collective, and seeks to support all people. When we come together to learn, and both listen closely and use our voices intentionally, great learning and understanding can happen."

Regarding the Two Worlds approach, which was the second strategy we intentionally employed in this project, one participant indicated that it is "such a gift to learn from Elders and Tribal members and to learn from and with them as we step forward onto this new path of community building." Another indicated how powerful it was to have this cultural encounter through the text we used and through our Indigenous mentor and the guests she invited; it opened her eyes to see through different lenses while holding space to respect and wonder at our unique differences. Another commented on how fear of incorporating Indigenous perspectives in an insensitive or inappropriate manner kept her from using this in the past, but through the CoP, her confidence greatly increased. These participant responses not only shed light on the effectiveness of the Two Worlds approach for capacity-building, but also suggest meaningful cross-cultural learning that had taken place.

Through our work together, we also realized how appropriate the CoP strategy was for a Two Worlds approach. The CoP allowed perspectives to emerge that offered a change of paradigm, reframing beyond the dominant culture and toward a wider/longer view of empathy. It also offered the chance for others to be experts, particularly those who may not have had that opportunity to have been considered an expert with valuable stories and lived experiences to share. The CoP allowed for sharing cultural knowledge and bringing social identities into spaces where they had not always been valued or respected. The CoP was also very suited to the Two Worlds approach, as it embraces shared learning and knowledge; our Indigenous mentor would often say, "I can't tell the whole story, but I can tell a little bit." In the CoP, we each had a piece of the story. No one person could contribute it all, but each member had something important to offer. We intentionally invited participants from a range of experience levels, backgrounds, and work settings, and that seemed to serve the group well, particularly in the spirit of the CoP and Two Worlds approaches that embrace storytelling as a valued form of learning and with the recognition that everyone has a part of the story to tell.

CONCLUSION AND FUTURE PLANS

In the words of a participant, the CoP process and experience were very affirming, life-giving, and authentic. As such, perhaps we would consider the most significant change that resulted from this project was, as expressed by a participant, "collective gratitude and hope for continued learning and growth regarding empathy." We feel this gratitude and hope will continue to feed and sustain practitioners' own empathy tanks and fuel their energy and inspiration to continue teaching toward and supporting empathy in their professional and personal lives.

We anticipate participants will continue acting on their vested interest in empathy-building through embedding the strategies we created and deepened together in our respective work settings. The experience has spurred what seems to have strong potential for continued and ongoing knowledge deepening. Also, due to the expressed desire to continue the CoP, we submitted a proposal to another funder to support the CoP during the 2023-2024 academic year. Participants recognized the vital need to engage appropriately and authentically in empathy building through outdoor learning on and with Indigenous land, particularly regarding honoring historical and ongoing trauma. We also seek to further explore how cross-cultural learning can be both a mechanism and outcome, building upon what unfolded in this CoP, where the Two Worlds approach gave way to considering new ways of thinking and being while honoring our unique differences.

As we look to the next CoP, we recognize that this CoP relied heavily on written words to convey the co-constructed knowledge, though we do want to emphasize the conceptual model included in the Appendix which visually depicts the empathy model co-created by our CoP. This reliance on the written word is in part due to the value we placed on each participant's voice and perspective. While we did collect extensive audio recordings of the CoP sessions, we agreed from the outset with participants that audio recordings would not be shared beyond the CoP team, and instead learning would be distilled and shared in a written format that participants had the opportunity to revise together. However, we plan to challenge ourselves to conceptualize the expressions of knowledge and the learning that unfolds more broadly, recognizing the valuable ways to not only gather information but engage with and express knowledge in ways that appropriately draw from and honor Indigenous approaches (such as oral storytelling, visual language, art, play, etc.). By doing so, our intentional Two Worlds approach will be reflected in every phase of the project, from design to knowledge co-creation and dissemination. We hope other professional learning communities will also consider ways to create and share knowledge that are relevant and appropriate given their community and context.

As of publication, we have received funding for the CoP to continue. We look forward to exploring creative ways of knowledge creation and dissemination, as we transition from a grounding in empathy and moving forward together with a focus on reconciliation. Funding and future CoP aside, the vision is for the CoP to continue as a fruitful place of learning and connection. While we used best practices of CoPs to guide this professional learning program, a true CoP takes on a life of its own and becomes self-sustaining beyond any one grant project or year. The authentic desire among participants to continue learning together as a CoP indicates we have successfully fulfilled the purpose of a CoP, ongoing relationship-building, and improving professional practice.

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APPENDIX A ([pdf version with links](#))



Deepening Empathy:

A Toolkit for Supporting a Community of Practice Exploring Empathy in Early Childhood

The links and resources below are offered to support your empathy learning. We hope they will inspire Communities of Practice across contexts to strengthen our broader field.

About Empathy

[The Case for Empathy](#)

[Best Practices for Developing Empathy Toward Wildlife](#)

[Five Tips for Cultivating Empathy](#)

[Flourishing in Nature Research Brief: Investigating the Impact of Nature Preschools on Young Children's Empathy](#)

About Communities of Practice

[Community of Practice Design Guide: A Step-by-Step Guide for Designing & Cultivating Communities of Practice in Higher Education](#)

[Community of Practice Facilitation Guide](#)

[Community of Practice Resource Kit](#)

[Cultivating Communities of Practice: A Guide to Managing Knowledge - Seven Principles for Cultivating Communities of Practice](#)

The Two Worlds Approach

[Indigenous Knowledges and Western Knowledges in Environmental Education: Acknowledging the Tensions for the Benefits of a “Two-Worlds” Approach](#)

[How Two-Eyed Seeing, ‘Etuaptmumk,’ is changing outdoor play in early childhood education](#)

[Two Eyed Seeing in the Classroom Environment](#)

Learning with Indigenous Partners

[Guidelines for Practicing Indigenous Traditional Protocols – University of Regina](#)

[Why a Land Acknowledgement Statement?](#)

[A Guide to Indigenous Land Acknowledgment](#)

[Beyond Land Acknowledgment: A Guide](#)

[Pedagogical Talking Circles: Decolonizing Education through Relational Indigenous Frameworks](#)

[Guidelines for Working with First Nation, Metis and Inuit Elders and Knowledge Keepers](#)

[Education for Reconciliation: Elder Protocol](#)

[Indigenous Giving Practices](#)

Deepening Empathy through a Two Worlds Approach CoP

[Natural Curiosity 2nd Edition: A Resource for Educators: The Importance of Indigenous Perspectives in Children’s Environmental Inquiry \(University of Toronto, 2017\)](#)

[Natural Curiosity Video Modules](#)

Deepening Empathy CoP Session Overview

Session	Pre-Session Participant Preparation	In-Session Activities & Aims	Post-Session Reflection
<p>1. Co-Creating our Community of Practice</p>	<ul style="list-style-type: none"> - Watch: intro video on the Natural Curiosity website - Read: page 5-10 in <i>Natural Curiosity</i> text 	<ul style="list-style-type: none"> -Getting to know one another -Orienting to the work at hand -Co-creating how we would like to learn together (group agreement) <p>Sample Agenda for Session 1</p>	<ul style="list-style-type: none"> -What are five words you think of when you think of empathy? -Why does empathy matter to you? To your work? To the world?
<p>2. Lighting the Fire (<i>Natural Curiosity</i>, 2017)</p>	<ul style="list-style-type: none"> - Watch: Video for Branch 1 - Read: page 58-64 in <i>Natural Curiosity</i> text - Read biography from <i>Spirit of the Ojibwe</i> (Balbin et al., 2012) 	<ul style="list-style-type: none"> - Guest Speaker - Journal Reflection - Small group sharing to integrate learning across guest speaker, readings, and own experiences. <p>Sample Agenda for Session 2</p>	<ul style="list-style-type: none"> -What's standing out to you after the reflecting and sharing we did together? -What is shifting or deepening for you as you think about what empathy means, what it looks like?
<p>3. Sending Out Roots (<i>Natural Curiosity</i>, 2017)</p>	<ul style="list-style-type: none"> -Watch: Video for Branch 2 -Read page 82 - 87 in <i>Natural Curiosity</i> text -Optional: Read page 65-79 	<ul style="list-style-type: none"> -MidWay point, begin synthesis of learning - Introduce Empathy Chart (meaning, strategies, importance) -Group discussion <p>Sample Agenda for Session 3</p>	<ul style="list-style-type: none"> -What's standing out to you after the reflecting and sharing we did together? -What is shifting or deepening for you as you think about what empathy means, what it looks like?

Deepening Empathy CoP Session Overview

Session	Pre-Session Participant Preparation	In-Session Activities & Aims	Post-Session Reflection
4. The Flow of Knowledge (Natural Curiosity, 2017)	<ul style="list-style-type: none"> -Watch: Video for Branch 3 -Read page 104 - 108 in Natural Curiosity text -Optional: Read page 88-102 	<ul style="list-style-type: none"> -Guest speaker -Whiteboard reflection activity reflecting on today and building on last time - Full Group Discussion <p>Sample Agenda for Session 4</p>	<ul style="list-style-type: none"> -What is shifting or deepening for you as you think about what empathy is and how we can nurture it in young children? <p>Mid point evaluation hand out</p>
5. Breathing with the World (Natural Curiosity, 2017)	<ul style="list-style-type: none"> -Watch: Video for Branch 4 -Read page 134 - 139 in Natural Curiosity text -Optional: Read page 109-131 	<ul style="list-style-type: none"> -Story sharing - Small group discussion -Full group discussion <p>Sample Agenda for Session 5</p>	<ul style="list-style-type: none"> -As you reflect on our work over the last 5 months, what has deepened for you as you think about what empathy is and how we can nurture it in young children? -In what ways are you implementing what we are learning here?
6. Bringing it all together, synthesizing and sharing the learnings	<ul style="list-style-type: none"> -Read our co-created Empathy Narrative -Reflect if you were going to share what we've learned with other early childhood educators, what would you share, draw, or synthesize? 	<ul style="list-style-type: none"> -Story Sharing -Small group work -Synthesis Activity -Full group discussion <p>Sample Agenda for Session 6</p>	<p>Final Reflection Survey emailed post session</p>
7. Celebrating our Learning: Community Potluck	<p>Bring a dish to share!</p>	<ul style="list-style-type: none"> - Dinner & Celebration - Talking Circle - Closing Ritual <p>Sample Agenda for Session 7</p>	4

Acknowledgments

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First and foremost, to the land Mni Sota Makoce (Minnesota), which has been cared for and called home by the Anishinaabe, Dakota, Northern Cheyenne, and other Native peoples from time immemorial.

We are deeply grateful to our co-facilitator and mentor, Thelma Nayquonabe, a lifelong educator and Anishinaabe elder who generously shared her stories, wisdom, experience, and community. Thank you to the guest speakers Thelma invited into our circle, whose vulnerability, humility, and empathy deeply impacted this work: Sara Balbin, George Morrow III, MacKenzie McShane-Cadotte, and Randy Cadotte.

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Natural
Curiosity

The Importance of Indigenous
Perspectives in Children's
Environmental Inquiry

APPENDIX B

All Relatives Share Empathy: A Reciprocal Empathy Model



By the Deepening Empathy Community of Practice

Fouzia B. Bhat, Alexis Bruno, Haley Diem, Dr. Julie Ernst, Mikayla Falteisek, Kalina Groothuis, Desiree Hagenbeck, Melanie Michaels, Meghan Morrow, Thelma Nayquonabe, Ahna Neil, Emma Richtman, Moss Schumacher, KrystalLyn Tomlinson, Claire Underwood, Sarah Walker-Davis, Laura Whittaker, Sarah Wilcox, and Mandi Wojciehowski.

Duluth, MN
2023

Preface

This work is the culmination of seven months of shared inquiry and learning by a group of fifteen practitioners in Northern Minnesota. These practitioners working at the intersections of early childhood, nature-based learning, and empathy came together to deepen our understanding of empathy through engagement with Indigenous perspectives and building capacity to foster empathy with wildlife and people. Taking a Community of Practice (CoP) approach valuing storytelling and knowledge co-construction, we offer the following with humility and gratitude for all who shaped and shared in this work.

Acknowledgments

First and foremost, we give deep thanks to land Mni Sota Makoce (Minnesota), which has been cared for and called home by the Anishinaabe, Dakota, Northern Cheyenne, and other Native peoples from time immemorial. To all our relatives, from earth to sky, the winged, the hoofed, and the finned ones (LaDuke, 2014), we give thanks.

We are deeply grateful to our co-facilitator and mentor, Thelma Nayquonabe, a lifelong educator and Anishinaabe elder who generously shared her stories, wisdom, experience, and community. Thank you to the guest speakers Thelma invited into our circle, whose vulnerability, humility, and empathy deeply impacted this work: Sara Balbin, George Morrow III, MacKenzie McShane-Cadotte, and Randy Cadotte.

We also share gratitude for the planning team: Dr. Julie Ernst, Claire Underwood (co-facilitator), Thelma Nayquonabe (co-facilitator), and Sarah Wilcox, who brought forth this project, held space for this work and organized the many logistical details.

We are deeply grateful for ACE-Advancing Conservation through Empathy and the Lake Superior Zoo for seeing the value of this work and generously supporting it. We also express sincere gratitude to the Great Lakes Aquarium for generously hosting our gatherings.

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Most of all, to the 15 participants who deeply committed themselves to this work, listened with their whole bodies, shared from their hearts, and whose insights make up these pages: Fouzia B. Bhat, Alexis Bruno, Haley Diem, Mikayla Falteisek, Kalina Groothuis, Desiree Hagenbeck, Melanie Michaels, Meghan Morrow, Ahna Neil, Emma Richtman, Moss Schumacher, Krystallyn Tomlinson, Sarah Walker-Davis, Laura Whittaker, and Mandi Wojciehowski.

For all this and more, we give deep appreciation and hope this work will inspire and support you in your own teaching practice and empathy journey.

Introduction

For seven months, we deeply explored empathy through engagement with Indigenous peoples and perspectives. We have sought to take a *Two Worlds Approach*, which acknowledges the differences between Indigenous and Western knowledge systems and avoids knowledge domination and assimilation by engaging in a learning philosophy based in equitable inclusion. This approach embraces storytelling as pedagogy and enables the heart, brain, body, and spirit to collaborate to evoke an outpouring of critical thought and personal transformation (Kapyrka & Dockstator, 2012). We offer this work with humility, gratitude, and respect for the Indigenous traditions we have had the privilege of learning with and from.

This work has impacted every part of our lives, professional and personal. These pages are our attempt to synthesize that learning, with practitioners in mind. Perhaps you are a nature-based educator looking for resources to support your teaching practice, or a parent curious about how to nurture your child's emerging empathy, or an administrator wondering about how to support a more empathetic work and school culture. This learning is offered in the spirit of

an Indigenous view of knowledge, wherein knowledge flows without end: it is not owned, but shaped by community (Anderson et al., 2017). We hope you will take what is offered here and build upon it, joining in the flow of knowledge.

This resource is organized into six sections. First, we explore what empathy means and then its importance. We share grounding concepts from Indigenous perspectives that have guided this work. Then, strategies informed by the grounding concepts are shared, and challenges to empathy from our own experience. Finally, several stories are shared as concrete examples. Throughout, we have offered reflection questions to guide your own thinking and join in the co-creation of knowledge.

What Empathy Means

Empathy is often defined as the understanding and sharing of others' emotions (Knafo-Noam et al., 2009). Empathy includes cognitive (understanding or knowledge), affective (sharing or feeling with), and motivational (care or action) components. What, then, does empathy mean when informed by a Two Worlds approach?

Empathy is Active.

Empathy is *active* but does not always require action.

Empathy requires presence and active listening. Empathy is a choice to hold space and listen to another's experience. There is power in being heard and acknowledged. In this way, true empathy is not about fixing a problem. Empathy is a way of being through which we show understanding, compassion, and vulnerability.

Empathy is not only something that we feel, it is something that we do. Empathy is shared.

Empathy is Collective & Individual.

Empathy can be a collective experience, as well as an individual one. Empathy is a bridge to understanding different perspectives and different people. Everyone, human and more than human, deserves respect, empathy, and care. When we see empathy from this collective perspective, we can empathize on a grander scale: new possibilities emerge, and healing begins. This collective perspective nurtures movement for change and right relationship with all our relatives.

Empathy is a Reciprocal Cycle.

Empathy is a circle of reciprocity. Empathy feeds us and others, it is an endless cycle of giving and receiving: seeing and being seen, hearing and being heard, caring and feeling cared for. The empathy cycle is a circle that includes all beings that share our Earth: from rocks to the sky. All beings are active in sharing empathy, and we have much to learn from them. Empathy is not uniquely human, but it is essential to our human experience and part of the evolution of our species. Primatologist Frans de Waal has found evidence of empathy in rodents, apes, elephants, and dolphins (Waal, 2010). We have much to learn from nature and our more-than-human relatives about sharing empathy and engaging in the empathy cycle.

Empathy is not an unlimited resource. Throughout our lives, there are seasons of giving and receiving empathy. There might be seasons where your empathy is growing and blossoming. And there are also seasons where you need more empathy than you're able to give. That is completely natural and appropriate in everyone's life. There is no shame or guilt in having a lower capacity. Instead, we offer ourselves grace, acknowledging the ebb and flow of our own empathy and the wider empathy cycle.

All of life exists in a web of reciprocal relationships. We connect to Earth by giving and receiving, not by taking or controlling. When we acknowledge that reciprocal web and grow it with practice and experience, we enter into a deepened relationship with nature as teacher, and our own empathy is sustained and nurtured.

Empathy is Noticing.

Empathy is noticing: noticing others, noticing how the self is in relationship with others, noticing the capacity you have to give empathy. Through curiosity, we cannot help but notice, care, and act. When we notice the fullness of another being, we cannot help but love: kindly, openly, humbly, and empathetically.

Empathy is Humility, Vulnerability, & Humanity

Offering and receiving empathy requires deep humility and vulnerability: humility in knowing that we do not have all the answers and vulnerability in sharing our personal experiences. We each add an important piece to the wider collective. No one can offer everything, but we can each offer something. Often, what we can offer is simply our presence. When we empathize, we become a student with the opportunity to learn and relearn, growing deeper in our own understanding of self and others.

Pause & Reflect:

- Think of a time you offered empathy or a time you received empathy. What was that like? How did it impact you?
- How does what is offered here deepen or shift your understanding of empathy?

Why Empathy is Important

Empathy is a basic building block of connection.

Empathy is a basic building block of human connection. We want community and connection, in fact, we need it for our survival. As adrienne maree brown has articulated, “We know how to connect, we long for it” (brown, 2017).

Through the work of this Community of Practice, we have come to deeply understand how empathy carries us through our lives: we each are held within the empathy reciprocity cycle, and it is vital for us to connect to others and ourselves. With empathy comes connection, and with connection comes love.

In the absence of empathy, when we are disconnected from the truth of our connection, our world deteriorates. Instead of knowing our world, our relatives, and our place in the circle, we exploit it. In the presence of empathy, healing is possible. Through empathy, we understand the truth of our connection, and our place in the circle of life.

Empathy weaves a collective, reciprocal community that allows us to heal and move forward together. As we confront the truth of intergenerational trauma and the impact of settler colonialism, we know: history is not long ago, history is perspective. Empathy takes both looking behind & looking ahead. We cannot change the past, but we can impact the future using empathy as a tool for healing.

Pause & Reflect:

- Why does empathy matter? To you? To your work? To the world?

Grounding Concepts

Empathy is the way of life of the teacher.

The way of life as a teacher is to model empathy for children. In every interaction, children are watching us and learning from our behavior how to be in community. We can reflect and ask ourselves: what do they see? What do they learn from what they see? Sharing and modeling empathy supports children’s own developing empathy.

How we teach is, in fact, what we teach. We can spark connections through stories and play, and lead them toward understanding by authentically exposing them to place through play, learning with Mother Earth and the natural world. This active practice of empathy is the way of life of the teacher: modeling empathy to children and to the world.

Aki - Everything is Connected.

Empathy is about connection, and everything is connected. We are of this Earth, we are of this place, not above it. The Earth is alive, and the creator's spirit is present in all. As we have learned:

The Anishinaabe work *Aki* is often translated as 'the land' or 'Earth,' but this is just a translation of the word into English thinking. Some Anishinaabemowin speakers say *Aki* can translate as 'everything,' An Indigenous sense of place extends to anything conceivably related to a place: The waters around us and the blood in our bodies, which are, of course, both connected with Grandmother Moon; all the stories of place that sing in local ways to the mysteries around us; all the dead and unborn who have walked or will walk where we do, and who once breathed or will breathe the same sacred molecules of air; the dew at our feet, which speaks with the star beings above us, and so on, in every direction and in relation to everything (Anderson et al., 2017, pg 82-83).

Everything is related. Nothing exists in isolation. Understanding how the world is deeply connected allows us to learn from our nonhuman relatives and experience the challenges and joys of existing together in this place and time. We are all connected on this Earth, and we need to honor one another and heal together.

7 Generational Thinking.

We are all connected to each other: not just in this space and time, but in the future and in the past, as well. The teaching of 7 generations, the instruction in the Creation story to care for Mother Earth for the next 7 generations, reminds us of our obligation to take a longer view, prioritizing the needs of the Earth beyond what we will ever see (Kirmayer et al., 2011).

As we empathize, we think of not only this moment but of 7 generations and the wider collective. To be deeply connected to the past, present, and future, to see through a 7 generational lens, changes the way we look at empathy and how we interact with the land. Our impact ripples through the generations. We are touched today by those who have gone before. We touch those who have yet to come.

Children are Capable - We Can Learn From Them.

We have a lot to learn about empathy from children and the ears they have open to nature. Children are tremendously capable, and we affirm and honor that capability by supporting children in learning that they can help heal and help each other. It's not just the responsibility of the caregiver or the teacher to offer empathy - children are also part of the community and capable of offering empathy to one another. We see the ways children already do this: they contribute their unique strengths, offer care to one another, and help their peers resolve conflict, in doing so, they build community.

Indinawemaaganidog - All Are Related. All are Respected.

Indinawemaaganidog, the Anishinaabe word for all our relations, speaks to the deep interconnection between humans and the more-than-human world. The living world is our relative: plants, animals, and rocks, are all our relatives. As we have learned:

Everything is alive with Spirit, we are related to everything, and our relatives include animals, plants, the elements, past and future beings, subtle levels of being, and the spiritual world beyond time and space (Anderson et al., 2017, pg 82-83).

All life is sacred, whether plants, animals, or humans. Even beings that are no longer living still have value, they still deserve respect. We honor all our relatives through our way of life of modeling empathy, not formal teaching.

Within this acknowledgment that all are related is an inherent respect. This respect is not the dominating, oppressive "respect" used to reinforce the status quo. This respect is rooted in mutuality. It seeks balance, a give and take, and awareness of the life and spirits around us.

Not Everything Can Be Fixed.

We cannot fix everything, and true empathy does not require that we do. Oftentimes, when we are in need of empathy, we simply want to be seen and heard, to feel our feelings with someone close by supporting through their presence. The same is true for children. Often, they will come to their own solution simply through having the space to share with a trusted adult. You can't fix everything, but you can be present. This is essential to remember in our teaching.

We Are Not Meant to Do This Work Alone.

In a Western mindset, we are often isolated. We have forgotten the truth that we are not meant to do life alone. We need community. This community and connection free us. We do not have to know everything or be everything, and yet we each have something important to contribute. When we see ourselves and others in this way, we understand there is no need to compete or compare, when we all bring a valuable contribution.

When we apply this framework to a school community, it creates a spaciousness where each person, child, and grown-up, are valued, respected, heard, and seen. From this place, we can build an egalitarian, supportive, empathy-building community, that is not hierarchical but mutually supportive.

Pause & Reflect:

- Which of these grounding concepts resonates with you? What would you add?
- What grounds or shapes your understanding of empathy?

Strategies

Take an Indigenous P-A-U-S-E.

We have become used to interrupting or talking over someone. This is not how it has always been. We can learn from our Indigenous siblings and take an Indigenous pause, where we pause to fully hear someone, fully taking them in, absorbing what they have to say. We listen not to prepare our response, but to fully hear one another. When we pause, our response is genuine. We have stopped to listen deeply to another, and to ourselves.

Practice Embodied Authority.

As grown-ups, it is our role to offer an embodied authority to the children in our care that is steady, safe, and predictable. This embodied authority looks like establishing clear expectations and holding clear boundaries that express care for the children. Through these boundaries, children come to understand that it is not only their parents who care for their well-being and safety, they are held and cherished in a wider web of community. Depending on age, clear expectations can be co-created, affirming children's belonging to the community. Within this safe container, children are simultaneously held and free to be themselves.

One way we can practice embodied authority is by meeting them where they are. Through this experience of the embodied authority of their teacher, the child experiences the truth of a community who loves them. In this nest of closeness, security, and safety, children's empathy can flourish.

Listen and Speak with an Open Heart.

There is deep power in listening to each other. When we listen deeply, we don't try to solve the problem or think about how we'll respond back. When we "listen with the ear of our heart," we are able to be fully present. Through presence and active listening, we can honor the experience of another without judgment or comparison. This allows us to experience life through an open lens and share our experiences through our whole hearts. The Anishinaabe word *Debwewin* teaches us to speak from the heart (Goulais & Curry, 2005). It is our responsibility to share our inner truth: to listen with our whole body and speak from our heart.

Seek out Stories.

Over time, stories build empathy and connection. Sharing our own stories, fiction, and nonfiction, as we speak with an open heart builds connection. Sharing the stories of the land roots us in our place. "The life of the land is

embedded in stories from where we live” (Anderson et al., 2017) p 86). We must seek out, listen to and learn from the Indigenous peoples where we live, remembering that “stories and knowledge of our place ultimately live in people, not books” (Anderson et al., 2017, p 87). Stories are embedded in place, they bring us together in our place.

Hold Open Space & Time.

Many children are in tune with nature, and so at home in their play and in their world. Our job is to hold open that space for their unfolding connection. We sense and know that some children are often closer in their connection to spirit. We can hold open space for them to grow in that connection and live with an Indigenous sense of place.

It has been said that children have 100 languages (*Reggio Children - 100 Languages*, n.d.), but nature also has hundreds of languages. When we give children time and space to relearn the language of the relatives that we as adults may have lost, it can feed and support children’s natural tendency to build relationships with place. We know children are ready and can enter into a deep sense of place more quickly than adults may think (Anderson et al., 2017).

We know not all children have been supported in their connection to nature and may have cultural or systemic barriers to nature. Children may need support, guidance, opportunity, exposure, and modeling to connect comfortably with nature. We remember that it is our role as teachers to meet children where they are and support them in their journey.

Children, and adults, need space to identify and feel their feelings. When we hold open space for feeling and reflection, we support children’s regulation and their developing empathy. We can do this by giving children time to decompress, acknowledging and validating feelings, and listening at their level when they are ready to talk.

Model.

Children learn by watching how we live, they watch us to see how we treat other people and learn from our example. The teacher guides, models, and sparks connections for children to nature, community, and history. Together we can learn the land’s history, asking: who has played here, learned here, breathed here, grown here? What has happened: for them, the forest, and you?

There are infinitely many ways we can model empathy: through art, stories, reciprocity, listening, apologizing, making repairs, and speaking our truths as teachers. In speaking our truth, in developmentally appropriate ways, we show them that adults have feelings too! We model in every moment, whether we like it or not. We can and should model empathy in many different ways, always striving to meet the children where they are at. Hopefully, by watching us, children learn that empathy and emotions are shared by all of our relatives: it’s everyone’s job to contribute to the empathy reciprocity cycle.

Support Children in Sharing Empathy

Children are remarkably capable. They have a natural curiosity and desire to care for one another and our Earth. We can give them the language and confidence to support and respond to each other. In supporting their skill development and offering opportunities to practice, children can respond to one another. This is so much more powerful than an adult responding! By responding to one another, they build emotional connection and resilience; they know they are capable and do not need to rely on us as teachers. We are there to support them, but we step back so they can feel good about responding to one another. In doing so, their empathy, confidence, and connection flourish.

Honor Differences + Hold Similarity.

Honor and acknowledge everyone’s different backgrounds. Exposure to other ways of doing and knowing cultivates empathy and deepens understanding. Teaching and showing that there is more than one answer and so many ways to do things helps us remember that within the collective, we are each unique individuals. We remember: everyone is related, and everyone deserves respect and care.

Sometimes empathy may not make sense to you, but it matters. We do not have to understand another fully to be present and hold space with them without judgment or shame. We can trust and believe their experience without fully knowing or understanding.

Honor Trauma.

Honoring trauma is vital. Everyone has traumas, whether it's in this lifetime or in their ancestors. We are here, in this place and time, to heal together. Through presence and listening, we can be someone children know they can come to when they're hurting.

Nurture Our Self-Knowing and Connection to Nature

Self-awareness and self-knowing are central to empathy. In the spirit of the reciprocal cycle of empathy, we must each take space for deep reflection on our own journey. A key way we can do this is by taking time in nature to nourish ourselves. Nature is a teacher and a healer. Each of us can create a practice that supports our own empathy work by making space to listen, learn, and be in relationship with nature. In doing so, we will remember, we are not separate from nature we *are* nature.

Pause & Reflect:

- What strategies are you already practicing? What is new to you?
- How might these strategies shift or support your work?

Challenges

We Don't Always See Our Impact.

Every day, we are working to build growth in children that we may never see. We ask ourselves, am I reaching them? Am I supporting them in the ways that they need? Those questions may never be answered.

Though we may never see the impact of our work, it is still valuable, it matters. It is our role to plant the seeds in children to grow a beautiful, empathetic life, and to support them in responding to and nurturing one another.

One Size Doesn't Fit All.

We've noticed that for some people, for some children, it seems inherently harder to practice empathy than for others. This could be for many reasons and is unique to each child. Everyone moves at their own speed, it's our job to meet them where they're at. We can do this by continually offering empathy to them and trying new approaches that are responsive to the needs of the child. For children who have not experienced empathy from their caregivers or who struggle with their empathy development, nature can be an especially important outlet and source of empathy that we can support their connection to.

Feeling Outnumbered.

Sometimes we as adults feel outnumbered by the level of needs and support of children and their families. We try to adjust and meet every need as best we can, and sometimes we simply can't. In those moments, we remember: children are capable! Empathy can be shared by teachers but also by students. One of the most powerful things we can do is support the children to respond to one another. This might not always solve the problem but it is helpful to remember: we can't fix everything, and we are not alone in the work of empathy.

Filling Our Own Empathy Tanks.

As we've noted, empathy is not a limitless resource. When we give so much of ourselves, we also need to receive. This is easier said than done! It is vulnerable, but not weak, to need empathy and support from our community. While it may feel uncomfortable, vulnerability isn't a bad thing. Being vulnerable is, in fact, an act of strength and courage.

Pause & Reflect:

- What challenges to empathy do you experience?

- How might the strategies shared above support you in navigating those challenges?
- What support can you draw on - from the earth, from your community?

Stories

Voices of the Forest

In the winter, of course, we're kind of the only ones in the woods, and it's easy to yell and be super loud. It's just us, and it just echoes down the hillside. But as the leaves started to come in, and the birds started to come in this spring, the children's volume started to bother me. And from our time together, I started realizing that the other beings in the forest are probably bothered by their sound too.

And so I started talking about the work that the birds have to do and the way that they need to communicate with each other and that this is their forest as much as our forest. And so it's been really neat to watch how the children have responded to this idea that the bird calls need space. So I started sharing this, and my co-teachers started sharing this.

Today we were in the white pines playing. And when we came in, the children were so excited to be there, they were very loud. And Lexi brought everyone together and said, 'I can't hear the Ovenbird anymore. When it was here, it was calling out 'Teacher, Teacher, Teacher,' and I love to hear it because it's singing my work, and I can't hear it, it stopped talking.' And the children started getting quieter and quieter. And then we could hear the bird call again. And it just is like a way that these teachings have kind of gone through the filter of what we are doing and starting to come out in lessons that are connected to this learning.

It Doesn't Happen Overnight

These children deserve that connection point with me and for their needs to be seen and heard with their big feelings. And that this ripple effect, of all this energy and time that we put in, we might not see it. And you have to accept that because you still know that you're modeling it, that you're showing up for this child. And it can be very taxing. And you try to find ways to do self-care when the day is done because in the moment, you can't always give yourself that grace when it's just like something immediate that needs you.

But one of the children in particular, like, there was a softness to him really coming out, particularly the last month of school, and this connection with me that was really deep trust, and to get to that point. And even if it was just the last month of school, it was like we were seeing evidence of the hard work that we were putting in. And there's just this reminder that a child's ability to show empathy just doesn't happen overnight, and it might not happen in our time with them. And it was really helpful because I felt like there's a lot of pressure like, oh my gosh, like, why, what, how can what I'm saying isn't sinking through? But it doesn't happen overnight and to keep trying.

Teaching the Honorable Harvest

As new things are coming up: green things, flowered things, all wonderful things that children just want to have. We're teaching the honorable harvest, using Robin Wall Kimmerer's, guidelines of the honorable harvest, and I felt the part that is always tricky for me is having the children ask permission. You need to ask permission. They're like, 'Yep, it said yes. It said yes, it said yes, it said yes.' And, it's always such a tricky one to give to them to be like, Okay, how do I give you this information and to have you actually listen to the answer and slow down?

And so I was thinking of all of our conversations, that the way to connect people is through empathy. So how can we ask permission and really listen to the answer through empathy? And so we introduced all of the Honorable Harvest principles kind of loosely. Okay, first things first, greetings and gratitude. When you give a greeting, you need to know the plant. So if you greet a dandelion, you need to say hello to the dandelion, not just like, 'Oh, hey, there thing.' No, you give greetings and offer gratitude. And you never pick the first, and we pick the last - all of these wonderful ones. And they were really getting the idea of 10, ok there has to be many in order for me to pick one. But then it started to be like, 'Okay, there's 10!' So now I'm just gonna start going at it. And if there are 10, then one person picks one.

And then, 'well, if you picked one, then I can pick one. And I saw that you counted 10. So I'll pick one.' And so we started thinking about how can we listen to the plant? How can we listen to that answer?

And so we started to then dive deeper into, well, we don't speak the same language, but the plant has a language. And we can listen to it by what we know of that plant. So, what do we know about a dandelion? Well, we know that they have a blossom. So should you pick a dandelion before it blossoms? No, certainly not, they decided. And we know that it's one of the first flowers for the pollinators. So if there's only a couple, should you pick them? No, because they haven't done their job in the forest yet, which is to provide a safe haven for the pollinators in those early years. And then once you've asked all of those questions, and really thought about, what is the role of that plant in, in this ecosystem, then if you can answer all of those questions, and like hear all of those questions from the plant, and the way that I phrased it kept being like, 'Okay, well, what are you hearing from the plant?' And then they would say, 'Okay, well, I'm hearing that the apple blossoms, there are many, but they want to become apples. So we can't pick any.' And 'well, I'm hearing that, that the dandelions are many. And they've had many days of being open. So the pollinators have had a lot of opportunity, and they are ready to share a dandelion with me'. And so then they would pick one, and it was just such a full circle of, how can I do this? What would the group say if I asked the group: How do I make this connection more tangible for them? And so that was really, it was really fun.

And today, I watched a couple of kids go by a dandelion and look at it. And then like, Uhhhhh, and look around, and then shake their heads and keep on going. And I was like, it's working!!!! They realize that there was enough that they could have picked one, but they really listened to the dandelion and realize, No, there aren't very many dandelions right here, or this particular dandelion is saying no. And so that was, that felt really good because that one's always tender for me working with preschoolers that just want it all.

Reciprocal Empathy Model

We have strived to summarize this learning in the form of a conceptual model. This model depicts the core themes and learning of this work.



The moon phases represent the cycles of empathy: it is natural and appropriate to experience different phases along our empathy journey. Sometimes we are the full moon, offering empathy brightly, sometimes, we are a waning moon, in need of empathy ourselves.

The circle represents the reciprocal empathy cycle within which all our relatives are held and active. The landscapes and ecosystems depicted are reflective of the land on and with which this work was created: the North Shore of Minnesota. Red-tailed hawk flies above, rainbow trout swims below. Humans are also part of this empathy ecosystem. A teacher shares empathy with a child on the bottom left, an elder watches on from a log, offering their insight and wisdom, and two children delight in the natural world and share empathy with the creatures they find (butterfly and sprouting plant). All relatives share empathy, and all relatives are held within the empathy cycle.

Closing Thoughts

We have learned through this work that we are deeply not alone here on Mother Earth. We are surrounded by a world that is alive. Our hope is that you know you are not alone - but held within the empathy reciprocity web.

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Let's Go Outside: Preparing Early Childhood Educators to Teach Outdoors

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ABSTRACT

The purpose of this study, which occurred during Covid 19, was to integrate outdoor learning in an early childhood undergraduate literacy course at a midwestern university. Over a twelve-week semester, eight early childhood preservice teachers participated in thirty-five outdoor activities covering all content areas. The goals of this study were to: 1. Educate preservice early childhood teachers on the benefits of outdoor learning for young children, 2. Engage them in preparing and presenting hands-on developmentally appropriate lessons outdoors and 3. Build their confidence in teaching outdoors. The participants' experiences were recorded in weekly journals and an exit survey. The findings from these two sources suggest that outdoor learning activities contributed to their knowledge of the benefits of outdoor learning and increased their confidence in teaching outdoors. Despite the limitations of this study, the preservice teachers were not allowed to implement these outdoor activities with young children or families due to Covid 19. This study can inform efforts toward encouraging teacher education programs to prepare future teachers to teach outdoors.

Keywords: teacher education, early childhood, outdoor learning

The focus of this study was to prepare preservice early childhood teachers to understand the benefits of outdoor learning, to involve them in experiential developmentally appropriate outdoor learning activities and to build their confidence in teaching outdoors. McKeown-Ice (2000) study of the status of the environmental education component of preservice teacher education programs in the United States, found "... that most schools have few requirements related to environmental education, and in the majority of schools environmental education is not institutionalized." This study further found that "Most colleges and universities have not institutionalized their commitment to environmental education in the ways they have to reading, science, and special education among others."

Cooper's studies (2015) state that despite the findings on how outdoor learning is relevant to the young child, "... outdoor learning environment goes virtually unmentioned in national and state level standards, guidelines and regulations and has been largely overlooked in the considerable efforts to enhance the quality of early childhood education". In Wisconsin, statute P134 says all teacher candidates in early childhood education programs are required to complete an environmental education requirement. The chair of the Early Childhood /Special Education Department at the University of Wisconsin Oshkosh was asked via e-mail, how does your program imbed environmental education into your early childhood program. She reported that courses that focused on Stem should include outdoor learning, but she observed this depended on the instructor's interest in environmental education. Her response agrees with McKowen-Ice's (2000) study that the inclusion of environmental education in courses is dependent on faculty with a specialization or interest in this area. Gunseli and Guzin (2017) recommend that "Teachers should be informed about outdoor education through pre-and in-service teaching training programs and outdoor education should also be incorporated into teacher education curricula." The findings from Ashmann and Frazen survey (2015) note that the range of ways in which teacher preparations are incorporating environmental education in K-12 instruction varies and "...should not be the responsibility of a single methods instructor."

In the past, the pioneers of early childhood all emphasized the positive aspects of the outdoor learning environment and its impact on real life experiences (Palavan, Cicek, Atabay, 2016). Friedrich Froebel, who founded the first kindergarten in the 19th century believed that "... children should grow in harmony with nature" (Ernst. & Tornabene 2012). Dewey believed that students learn through real life experiences outside of the classroom (Palavan, Cicek and Atabay 2016).

The Covid 19 pandemic has caused administrators, teachers and lawmakers to rethink the value of outdoors as a safe learning environment in which to motivate learning and promote creativity. During pandemics in the 19th and 20th centuries, doctors believed to combat epidemics such as the Spanish flu and Tuberculosis, children should be outdoors as much as possible (Semingson, P. Kerns, W. 2021; Wineberg, Beeth and Frazin 2021). Covid 19 has highlighted an opportunity for teacher education programs to prepare future teachers with an understanding of the benefits of outdoor learning, and to provide them with experiential activities that will result in their having confidence to teach their lessons outdoors. These experiential activities have the potential to make a significant change in impacting their teaching practices (Bolick, Glazier, Stutts., 2022).

Benefits of learning outdoors:

Learning outdoors has many benefits for young children (Lee and Baillie, 2019), families (Harris,2008), and teachers (Marchant, Todd, and Brophy, 2019) and it can enhance in-class lessons and understanding of the school community (Tangen and Fielding-Barnsley, 2015). Research studies show the following benefits for young children and parents:

- Engaging children in learning outdoors can improve their academic performance regardless of subject (Coyle, & Bodor, 2020).
- In the United States, schools that use outdoor classrooms and other forms of nature-based experiential education show significant student gains in social studies, science, languages, arts and mathematics (Cooper 2015)
- Students who engage in learning experiences outside of the classroom report having higher level of motivation and recall the materials more vividly (Claiborne, Morell, Bandy and Bruff 2020)
- Young children's cognitive flexibility and creativity are enhanced if they experience problem-solving in natural settings as opposed to highly maintained settings." ...young children need frequent positive experiences in nature, not only to grow in understanding of the natural world, but also to grow in understanding of who they are" (Ernst & Tornabene 2012)
- When parents engage their young children with at- home activities it reinforces what is being learned at school and "... makes the greatest difference in student achievement" (Harris ,2008),

Outdoor learning increases the learner's attention, reduces levels of stress, fosters self-discipline, increases interest and enjoyment in learning and promotes physical activity and fitness. Hofler (2011) states, "Spending time outdoors can make you happier or put you in a better mood. Studies showed that just five minutes of green exercise resulted in improvement in self-esteem and mood." Dewar (2018-2019) says that "Teachers as much as students might benefit from all these aspects of lessons in nature. Teachers can teach in a more engaging way after a bit of walking, a bit of a breather and change in scenery, and a dose of nature has rejuvenated their attention and interest and reduced their stress levels." Research shows that teachers being outdoors gives them a sense of increased satisfaction and well-being (Merchant, Todd, Brophy, 2019).

Fagerstam (2012) studies show when children are outdoors, they can gain cultural understandings of their community and develop greater appreciation of their community. "...they develop a sense of belonging in their natural environment and that it can improve children's identification with nature and culture." Outdoor experiential activities are of value to immigrant children in the United States (Children's Defense Fund Leave No Child Behind 2021). Tangen, Barnsley-Barnsley (2007) note children of immigrant parents can gain a sense of belonging and knowledge of the world outside of their classroom. "School grounds are an ideal environment in which to engage the potential students providing them with opportunities that can lead to improved attitudes and behaviors towards the outdoor school environment and better overall feelings for the school within the community and themselves as

members of the school community. Learning activities in outdoor settings encourages ESL students to take control of their learning through shared participation with their peers, releasing them from the intensity of classroom seatwork where their lack of proficiency of the English language and learning is revealed.”

Barriers to outdoor learning:

Mantel (2016) says the main barrier to outdoor learning is that “...few teachers are trained or have the experience of leading classes outdoors, despite the growing evidence showing how this can have a powerful effect on pupils health and well-being and their academic attainment.”

Other barriers are as follows:

- A lack of competence and lack of planning time support from administrators”. (McKeown-Ice, 2000)
- Teachers understand that outdoor learning promotes physical and social development but fail to understand how it promotes learning in other areas of development. (Ernst and Tornabene, 2009)

Palavan’s study (2016) interviewed teachers on their perspectives on outdoor learning and found “that teachers had limited time, classes were too crowded, lack of information about outdoor education, laziness, and concerns about meeting curricular deadlines. Teachers tend to think that outdoor education is just a matter of practice and there is no theoretical background to it”. Gardner (<https://thegardenschool.net/2018/06/12/why-teach-outside/>) surveyed teachers and identified similar findings to the barriers to teaching outside: curriculum standards, daily schedule, supervision of children, hazards, lack of knowledge, children aren’t dressed for the weather, and teachers don’t like being outside when it’s cold or raining.

Two colleagues from the University of Wisconsin Oshkosh with extensive experiences in the field of early childhood education were interviewed via e-mail to respond to what they have observed are the barriers to outdoor learning:

1. Do you think teachers fully understand the extensive research on outdoor learning?

Respondent A: *No, ...I honestly don’t think that teachers think beyond their classroom walls.*

Respondent B: *Most childcare and development programs (two -year associate degree) are focused on activities, and not so much on research and theory.*

2. Do you feel teachers are prepared to implement developmentally appropriate curriculum outdoors?

Respondent A: *No, I do not think so. In the education program, there are no courses that cover this sort of thing. In the real world of the early childhood classroom, the outdoor play period (recess) is usually a time for children to engage in free play. I rarely have seen teachers specifically plan activities outside for this sort of play. I know of a few family childcare providers that move their early childhood programs outside for the summer months. Teachers often think of that outside play time as more of a break from their active planning for the day.*

Respondent B: *I taught many different method courses during my time at the university. I cannot say where outdoor curricula fit, and if it had a high priority.*

Studies show that young children spend less than 23 minutes each day outdoors and one in three children spend no time outdoors (Copeland, et al, 2016 as cited in Dewar, 2018-2019,). According to one government estimate, the average American spends 90 % of his or her life indoors” (Hofler, J. 2011). Louv defined the current state of urban lifestyles in his book *Last Child in the Woods*, he stated “... children today are significantly less engaged with nature than children were a generation ago. More time spent in front of screens, and more structured and scheduled after-

school activities results in less time for today's generation of children to explore the outdoors. The results of this disconnect with nature can be seen in the health of today's children" (Hofler, J. 2011)

Tandom, Saelens and Copeland's (2017) study found parents' attitudes were not supportive of outdoor time and preferred learning to take place indoors. They were fearful of children getting sick in cold weather and children getting injured. "Parents of lower SES were less comfortable with their child playing outside at home, or at childcare, compared with parents of higher SES groups who were more comfortable with their children playing outdoors at childcare."

Design and Procedure

The purpose of this study was to integrate outdoor learning in an early childhood undergraduate literacy course at a midwestern university. Due to Covid 19 epidemic, the preservice teachers were not able to do these lessons with young children or their families. The preservice teachers embraced being outdoors, after two years of being indoors on Zoom. The eight participants, all women were enrolled in a twelve-week undergraduate early childhood literacy method course. The goals for this study were as follows:

1. Educate preservice teachers on the benefits of outdoor learning for young children.
2. Engage preservice teachers in preparing and presenting hands-on developmentally appropriate lessons outdoors.
3. Build preservice teachers' confidence in teaching outdoors.

In-class preservice teachers learned about benefits of outdoor learning and were informed of what should 4–5-year-old young children be able to do (<http://www.del.wa.gov/publications/development/docs/guidelines.pdf>):

- Predict what will happen in in outdoor experiences.
- Investigate the properties of things outdoors.
- Talk about changes in weather and seasons.
- Take walks to learn about colors and leaves they see outdoors.
- Respond to questions e.g. I noticed, I am curious about, and I think it would be better if.
- Take responsibility of caring for living things such as plants.
- Preserve the environment through disposing of litter properly, recycling.

The preservice teachers gained practical strategies when learning takes place outside such as: creating gathering places, designing problem- solving lessons and asking open ended questions. Three mornings a week, students went outside to a designated meeting area, and participated in over thirty-five developmentally appropriate activities that integrated all the content areas. They engaged in lessons that families could readily do with their young children outdoors. Doing their outdoor activities, the preservice teachers dealt with bees, wind, and a few chilly days. After each outdoor activity, there was informal discussion on what went well, what could be improved upon and their personal feelings about the activity. The preservice teachers were regularly reminded of the old Scandinavian quote: "There is no such thing as bad weather, only bad clothing" (Striniste, 2019).

Journals:

Each week, preservice teachers reflected in a journal on the outdoor lessons and received weekly feedback on their journal entries. Guidelines /prompts for journal entries included:

- In three words, what was your favorite thing that happened outdoors?
- Write down how you felt outdoors.
- How do you see the outdoor activities relating to teaching young children?
- How do the outdoor experiences relate to the required readings?

Surveys:

At the start of the semester there was no pre-survey to learn about their attitudes or experiences in outdoor learning. There was a survey at the end of twelve-week semester (Appendix A) to assess all aspects of the study. The first section of the survey asked the preservice teachers how likely they would engage in outdoor activities with young children, how likely they were to try new and different things and if their self-confidence in teaching outdoors increased. In the second section of the survey, the preservice teachers responded to open-ended questions regarding their engagement with presenting outdoor activities, what they saw as benefits of outdoor education and did their attitude change about teaching young children outdoors.

Lessons:

Over thirty-five lessons were chosen from three early childhood resources (Appendix B) that promoted and supported the National Association for the Education of Young Children Standards:

“Teachers provide time each day for indoor and outdoor activities (weather permitting) and organize time and space so that children have opportunities to work or play individually and in groups.” (The 10 NAEYC Program Standards <https://www.naeyc.org/our-work/families/10-naeyc-program-standards>)

“Teaching in ways that are appropriate to children’s maturity and developmental status, are attuned to children as unique individuals, and are responsive to the social and cultural contexts in which they live.” (Key Messages of the Position Statement, Developmentally Appropriate Practice, 3rd Edition”)

The preservice teachers were informed of the following strategies to make learning outside more effective:

- Set up rules for yourself and the children. Just as you have rules indoors you need rules outside. Maybe have signs outdoors with pictures such as this is our gathering place. When you hear the cow bell, we all come to our meeting place. Have children be responsible for carrying supplies outdoors.
- Plan how the outdoor lessons will be extended in the classroom. Have an alternative indoor activity ready if needed. Remember outdoor learning should not be limited to certain weather.
- Inform your parents that children will be regularly going outdoors. Expand lessons that children can do at home. Share with families the benefits of outdoor learning.

The lessons took approximately one hour and integrated all content areas. There were scavenger hunts and walks that emphasized understanding of literacy, print, life science, geography, and the visual arts. There was discussion before, during and after lessons to find out what they knew and what they learned. Lessons were done individually with a partner or whole group. Emphasis was on open-ended lessons that promoted problem solving. The lessons included how to ask questions such as What would happen if? What did you learn? These guidelines agree with Wilson’s research (as cited in Ernst & Tornabene, 1994) that outdoor learning should be a balance of direct experiences with nature and a “...balance of teacher-initiated and child-initiated explorations.”

Many books were read outdoors and then connected to all the content areas. Examples of these lessons included Alphabet by Leo Lionni, followed by decorating the first letter of their name with objects they collected in nature, Wonder Walkers by Micha Archer where they drew pictures of what they wondered about in their outdoor setting and Oak Leaf by John Sanford, where the students created a book to answer the question, Where did the leaf land?

Examples of at-home outdoor lessons that preservice teachers implemented were:

- Texture walk - around neighborhood to collect interesting objects that have fallen from trees and discuss how the objects feel.
- Teddy Bear picnic. Have a Teddy Bear Picnic with your parents Try out foods that are healthy for you.
- Wildlife stories: Make up a story about a tiny animal that lives around your house. How does it spend its day? What does it find to eat? Where does it sleep? Tell the story to your parent.
- Take a walk at night, read a book outdoors and drink hot chocolate and count trees in your neighborhood.

Journal Analysis:

Information gathered from the journal entries were related to the goals of the study and provided an insight into what was retained and understood from hands-on experiences outdoors. The first journal asked the preservice teachers to describe and reflect on their past outdoor learning experiences beginning with preschool to the present. The majority responded that they had limited outdoor learning experiences such as an occasional field trip or science lesson. Most of the journal entries described the outdoor literacy activities and their interest in doing the activities with young children. The weather was of concern to students, where some felt it was too hot or too cold and some expressed aversion to bees.

Here are two representative samples responding to the first journal entry:

- I absolutely love being outside, but many of my teachers/classes throughout my life never took advantage of being outside to teach. I took so many natural science classes and not even one took us outside. Outdoor learning needs to be used more considering how fun and engaging it is.
- When thinking about going outdoors in elementary school through college, I have come to the conclusion that I don't have any.
-

Entries expressed how preservice teachers felt about being outdoors and how it would benefit children's learning:

- I liked the above and below activity for many reasons. One being it expands the children's concept of below and above. It also gets them outside and allows them to observe nature. There are also many ways to create a book about what they saw or the whole class can contribute to one book. Giving them options allows the kids to take control of their learning.
- I used a song and dance for the beginning of the book. Kids can stomp their feet, clap their hands, shout. And they do not have to be quiet and stuck with a quiet classroom.
- I think doing our lesson plan for autumn while outside enhanced it because you can feel the breeze and see the leaves changing as we read.

Entries such as the following expressed how preservice teachers believed that being outdoors was of benefit to them.

- I feel outside, I can be open, and I can be myself. I can smile, listen, and laugh more. I feel more focused and energized, Today being outside has felt more familiar. I liked doing our walks and lessons because it makes me feel more comfortable and connected to the campus and community. It makes me feel confident here and in my teaching.
- This week has taught me so many new activities to try outdoors that involve the senses. I loved doing the sound walk. I am on campus every day and heard things I have never heard before. I have been taking activities from class to work with toddlers.

- Being outdoors helps me feel brave! Being outside helps me to be more creative. I feel happier when I am outside.
- Something that I truly enjoyed about being outside this week was the listening walks. I liked this because I usually have my headphones in and there are sounds that I have never focused on before. Who knew water and waves were so beautiful in the morning?

Survey analysis:

At the end of the 12-week semester, students completed an anonymous survey to assess outdoor learning experiences. The following questions were designed to relate to the three goals of the project which were:

- Educate preservice teachers on the benefits of outdoor learning for young children.
- Engage preservice teachers in preparing and presenting hands-on developmentally appropriate lessons.
- Build the preservice teachers' confidence in teaching outdoors.

The first three questions used a Likert scale:

1. How likely are you to use the nature activities we did this semester with young children?
 - Five responded highly likely and three responded somewhat likely.
2. I like to try new and different things.
 - Four strongly agreed, three agreed and one responded neutrally.
3. I have more self-confidence teaching outdoors.
 - Five strongly agreed, two agreed and one was neutral.

Questions four and five asked to describe personal feelings.

4. Please describe your feelings in presenting lessons outdoors.
 - I have never thought about doing lessons outdoors before and I really enjoyed it. A change in scenery and fresh air can allow for students to focus better.
 - I love doing the activities outdoors and actually have been doing them at work.
 - I felt very confident and content with our mini unit lessons, but it was raining so we stayed inside.
 - I felt like I could be more myself outside, like there are more distractions outdoors, but not distracting enough to pull the student away from the lesson.
5. What are the benefits of doing lessons outdoors for young children?
 - Children learn through their environment and senses and bringing them outside \allows them to learn more deeply.
 - Gives them freedom to explore their creativity, they can use their senses and feel more open.
 - They get hands-on experiences when collecting concrete things.
 - They get fresh air. The seasons change so they go outside, they can learn about the outdoors in a free and easy way, and they can do it at home.
6. In response to the question "Has your attitude about teaching outdoors changed?" Six responded yes, one expressed concern as she had not done these lessons with young children.
 - Yes, I never thought about teaching outside but now I definitely will. There's no such thing as bad weather as long as you dress for it.
 - I am not quite sure if my attitude has changed.

- It is given me more ideas. I want to implement daily /weekly outdoor walks.
- I have always been open to and willing to teach outdoors. The only change is I have a better idea of how to do that.
- Being outside makes me feel happy.
- I liked it, I feel like I have more confidence in myself.
- I loved doing the activities outdoors and have been doing some of them at work.
- I feel like I can be more myself outside.

Conclusion

While researchers note the benefits of teaching young children outdoors, teacher education programs have not prepared preservice teachers with this knowledge, nor provided them with experiential activities to feel competent in planning for the outdoor learning environment. This study focused on preparing preservice early childhood teachers to (1) Gain knowledge of the benefits of outdoor learning for young children, (2) Engage them in developmentally appropriate outdoor learning activities and (3) Build their confidence in teaching outdoors.

The findings from the journal entries and surveys agree with many studies that suggest that preservice teachers who have continuous firsthand outdoor experiences will gain knowledge and confidence in teaching outdoors (Hovey et al., 2020; Kassahun Waktola, 2009; Lindermann-Matthies et al., 2011; Marinho et al., 2017).

The result of the present study suggests that the preservice teacher's engagement in multiple outdoor learning activities promoted their knowledge of the benefits of outdoor learning and increased their confidence in teaching outdoors.

Implications for future research

Several factors have promoted the opportunity for outdoor learning such as Covid 19 and the growth of outdoor learning programs. "A 2017 national survey of nature-based early childhood educators reported more than 250 nature preschools and forest kindergartens across the country serving an estimated 10,000 children a year" (D'Souza, 2020, p. 3). The growth of outdoor programs can promote teacher education programs to collect "Good Practice" examples for young children and their families which would support the development of outdoor teaching for initial schoolteacher training (Wolf, Kunz, and Robin, 2022, p. 212). "Nature should be part of the teachers tool kit just like tech is" (D'Souza, 2020, p. 6).

Limitations

This study was limited by the small number of participants, the lack of a pre-semester survey and external factors of not being able to do the study with young children and their families due to Covid19. Future directions suggest that gathering outdoor experiences and strategies via interviews from a large scope of quality outdoor early childhood programs in various geographic and cultural areas will add credibility to the development of methods courses.

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E-mail interviews:

Dr. Louis Chicquette (March 2022)- Retired Professor of Early Childhood Special Education at the University of Wisconsin Oshkosh and Director of YMCA CHILDCARE in Appleton, Wisconsin. louischicquette@gmail.com

Dr. Susan Finkel (March 2022) Retired Professor of Early Childhood Special Education at the University of Wisconsin Oshkosh and Director of the University of Wisconsin Oshkosh Child Care, Oshkosh, Wisconsin. finkelsusan@gmail.com

Dr. Stacy Skoning (March 2022) Chair of the Early Childhood Special Education Program at the University of Wisconsin, Oshkosh. skonings@uwosh.edu

Appendix A

Resources for Lessons

Environmental Experiences FOR EARLY CHILDHOOD, (2011) Project Learning Tree American Forest Foundation, Washington, D.C.

Growing Up Wild Exploring Nature with Young Children Ages3-7 (2017) Association of Fish & Wildlife Agencies, Washington, D.C. Environmental Experiences FOR EARLY CHILDHOOD

Robertson, J., (2014) Dirty Teaching A Beginner's Guide to Learning Outdoors, Independent Thinking Press, Carmarthen, Wales

Appendix B

Survey Questions

Please review the nature activities we did this past semester in responding to the following survey. There are no right or wrong answers. Thank you in advance for your answers to this survey.

1. How likely are you to use the outdoor nature activities we did this semester with young children?
Very likely__ somewhat likely __ very unlikely __
2. I like to try new and different things.
Strongly agree__ agree__ neutral__ disagree__
3. I have more self-confidence teaching outdoors.
Strongly agree__ agree__ neutral __ disagree__
4. Please describe your feelings in presenting your mini unit lessons outdoors.
5. What are the benefits of doing lessons outdoors for young children? Explain.
6. Has your attitude about teaching outdoors changed? Explain.

CHILDREN'S BOOKS AND RESOURCES REVIEW

Erin Burggraf

Mkos Mboten

Pokagon Band of the Potawatomi, USA

Carla Gull

Book and Resource Review Editor

Merry Lea Environmental Learning Center of Goshen College, USA

Indigenous Perspectives in Children's Literature

There are 574 federally recognized American Indian tribes and Alaska Native entities in the U.S. Each tribe has a unique and rich culture, yet we are all still connected. Our communities still exist in this contemporary world while maintaining our traditions that have been passed down through the generations. Reading stories written by members of these communities and through our perspectives is important and allows us to share our stories in a culturally appropriate way. Unfortunately, only one percent of stories being published depicted a *Neshabek* character that our children can identify with. Reaching out to tribal communities and building relationships are essential for growth and understanding. Native American communities have a relevant past and future and deserve recognition beyond Native American Heritage Month. Our stories are medicine and sharing our stories from our perspective creates healing and connection with the community.

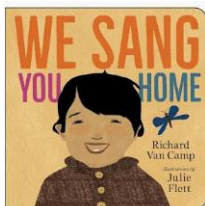
Additionally, when evaluating books, Brent Dunn from the Tribal and Indigenous Early Childhood Network suggests asking the following questions:

Cultural Authenticity: Is the story accurately related to our population(s)? how? if not, what's wrong?

Indigenous sources: Did this indigenous story come from indigenous authors? communities? illustrators? any partnerships to give validity?

Baseline: What can classrooms take from these texts if it is accurate? intertribally? Specific Nations?"

While we offer a few suggestions, continue finding books by indigenous authors, especially by tribes in your area.



We Sang You Home by Richard Van Camp

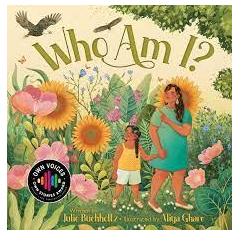
In this sweet board book, the bond between an infant and caregivers is explored through wishes, kisses, song, and more, with pictures of nature, home, and relationships.



We All Play by Julie Flett

This picture book celebrates playtime and the connection between children and the natural world. The animal actions and verbs encourage movement! Easily accessible for our youngest citizens, the animals and recurring concept that we all play works with children through kindergarten. The backmatter includes a list of prominent animals in the book with the names in Cree of one animal and other groupings of animals, along with a Cree pronunciation guide. There is a lovely note from the author that points us toward connection and kinship.

<https://greystonebooks.com/products/we-all-play>



Who Am I? by Julie Buchholtz

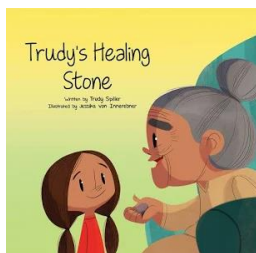
This picture book tells the story of how we are all connected to our ancestors, our past and future, and the Earth. Through beautiful illustrations, you can follow a mother and daughter through their journey of understanding and connection. Be the oak tree strong and mighty, the river that bends, the wild rose, wind that scatters seeds, rain that falls, fire that burns, and so much more! We are nature!

<https://www.juliebuchholtz.com/>



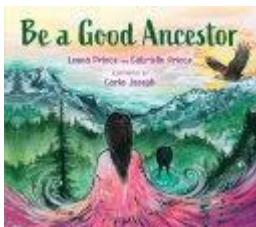
When We Are Kind by Monique Gray Smith

A simple picture book with a powerful message that encourages the gift of kindness and receiving acts of kindness. We can be kind by helping friends, elders, only taking what we need from the earth, taking care of ourselves, and that we are all related. Lots of emotions are simply explored such as respect, gratitude, kindness, joy and more!



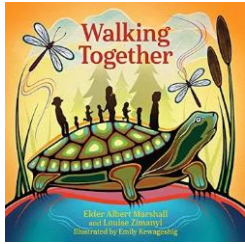
Trudy's Healing Stone by Trudy Spiller

In this simplified version of *Trudy's Rock Story*, children are encouraged to find a special stone for sharing their feelings. The rhyming text suggests putting the stone back where it was found and show it gratitude when our hearts are lighter. The book includes a short glossary of Gitksan words and how to pronounce them.



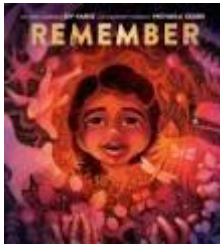
Be a Good Ancestor by Leona Prince and Gabrielle Prince

A picture book that encourages readers to realize the importance of community and the world around them. Starting with water, raindrops, puddles and streams, our connection to the natural world is woven throughout. The author explores seeds, the life cycle of a salmon, being neighbors, our thoughts, ideas, and feelings with an overall theme that we are part of a larger community.



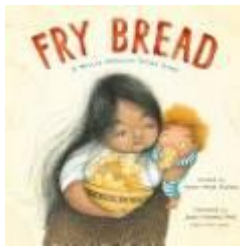
Walking Together by Elder Albert Marshall and Louise Zimanyi

This book urges us to walk together in a good way, including the concept of Etuaptmumk—or Two-Eyed Seeing. The book weaves nature, life cycles, seasonal changes and activities, relationships, and connections into a coherent theme of learning from both indigenous and non-indigenous ways of knowing. We learn from nature by spending time in it as we share, show gratitude, and care for the living things around us. There is even a little bit of loose parts art as part of the illustrations!



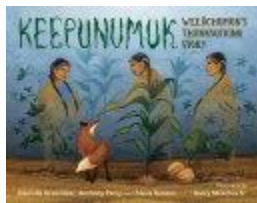
Remember by Joy Harjo

A poem with stunning illustrations reminds us of our importance in the world. The poem asks the reader to remember the earth and sky around us while getting to know the individual stars, moon, family members, and all the plant and animal life around us.



Fry Bread by Kevin Noble Maillard

This picture book provides a look at a modern Native American family and their community making fry bread, a dish that became traditional after tribes were pushed west and given rations of flour. This sensory filled book shares how fry bread brings people together, contributes to art, shares history, and has become a collective aspect of native tribes. The simple, yet descriptive text shares the story well. A recipe for fry bread is included at the end, as well as personal stories on how fry bread is food, shape, sound, color, flavor, time, art, history, place, nation, everything, and us!



Keepunumuk: Weeâchumun's Thanksgiving Story by Danielle Greendeer, Anthony Perry, Alexis C. Buntun

A picture book that retells the Thanksgiving story for a more inclusive America, a story that honors the Native peoples who made it possible. The book includes definitions, a pronunciation key, and recipe.

<https://keepunumuk.com/curriculum/>



A Gathering Is Happening Today by Aaron Martin

This picture book features the Potawatomi language and follows the happenings on the day of a Pow Wow.



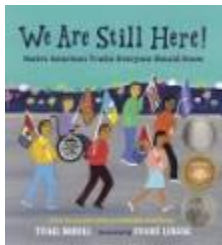
We are Water Protectors by Carole Lindstrom

After establishing a strong connection to our need for water, this picture book issues an urgent rallying cry to safeguard the Earth's water from harm and corruption. People come together in community to protect the sacredness of water. The book includes a pledge to promise to take care of the earth with additional backmatter on being water protectors.



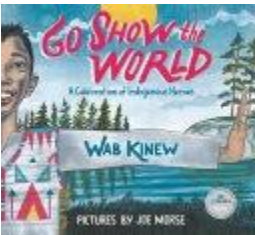
When We Were Alone by David A. Robertson

A young girl learns about her grandmother's time at Native American Boarding school as child, leaving her family, dressing the same as all the other children, having her hair cut, and not being able to use her native language. The girl understands why her grandmother now speaks in Cree, wears beautiful colors, wears a long braid, and spends time with family.



We Are Still Here! Native American Truths Everyone Should Know by Traci Sorell

This book provides a solid understanding of everything you never learned in school about Native American people's past, present, and future from an Indigenous perspective. This text heavy picture book is best for ages 7+, tackling tough topics and policy such as assimilation, allotment, termination, the native new deal, termination of treaties, language revival, etc. Backmatter gives a timeline of events, glossary, sources, and an author's note. The continuing theme is persistence through challenging times and "We are still here!"



Go Show the World: A Celebration of Indigenous Heroes by Wab Kinew

This beautifully illustrated book is a tribute to historic and modern-day Indigenous heroes. Kinew showcases a diverse group of Indigenous people in the US and Canada and their contributions, inspiring all of us to be good people contributing to our communities. Geared toward early elementary children, the author shares, "We are people who matter, yes, it's true; now let's show the world what people who matter can do."

Additional Resources

[Recognize the Land You Live On](https://native-land.ca/) - An interactive map to understand tribes, languages, and treaties pertinent to your area. <https://native-land.ca/>

[Indigenous Owned Bookstores You Need to Visit](https://bookriot.com/indigenous-owned-bookstores/) - Consider supporting indigenous owned bookstores as you shop for books. This list on BookRiot lists a few bookshops across the United States and Canada. <https://bookriot.com/indigenous-owned-bookstores/>

[Indigenous Perspectives in Children's Literature](https://youtu.be/M-qKOKgbj6k), Mkos Mboken and Indiana Children and Nature Network
In this webinar recording, Erin Burggraf shares her insight into showing diverse representations by native authors with the Indiana Children and Nature Network audience. <https://youtu.be/M-qKOKgbj6k>

[American Indians in Children's Literature](https://americanindiansinchildrensliterature.blogspot.com/), curated by Dr. Debbie Reese (Nambé Pueblo) and Dr Jean Mendoza
A website sharing a critical analysis of indigenous people in children's literature, including yearly book lists, books that are NOT recommended, tips for teachers, resources for research projects, and so much more! <https://americanindiansinchildrensliterature.blogspot.com/>

Acknowledgements

Migwëthh (thank you!) to Erin Burggraf for collaborating on this article! You can find her book suggestions and social media (Mkos Mboken) on this [linktree](#).

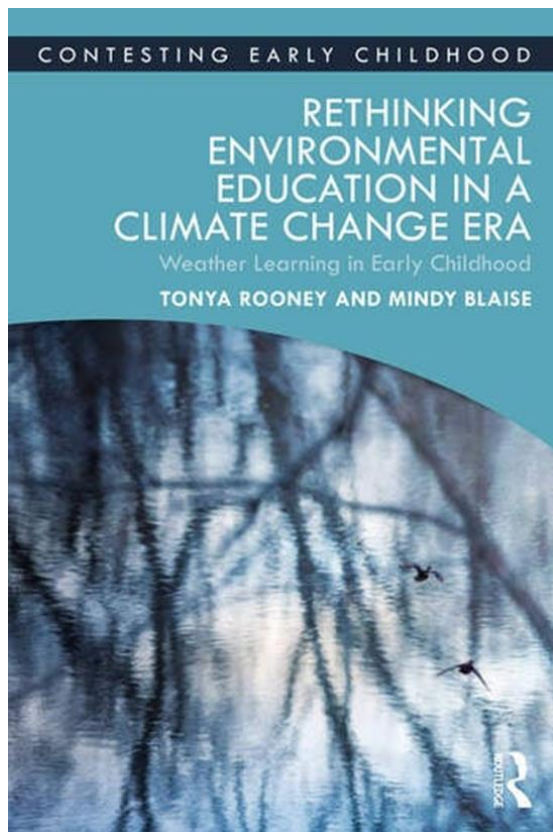
Mkos Mboken was created 3 years ago due to the tribal government shutdown and my program being, Neshnabe Mboken, being cut. It was important to me to continue to share stories with families in my community and that is how Mkos Mboken came to be. This year Neshnabe Mboken was brought back to the community. Neshnabe Mboken is a children's book club that focuses on books written by Neshnabek authors. My goal is for our children to see themselves in a story in hopes it inspires them to someday write their own story. – Erin <https://linktr.ee/Mkosmboken>

An additional thanks to the *Tribal and Indigenous Early Childhood Network* from the National Association for the Education of Young Children (NAEYC) and their regular conversations around children's books.

BOOK REVIEW

Peter Oluwaseyi Oyewole
Ayoola Bukola Oyewole
Kent State University, USA

Rooney, T., & Blaise, M. (2022). *Rethinking Environmental Education in a Climate Change Era: Weather Learning in Early Childhood* (ISBN 978-0-367-71344-7, 168 pages, Routledge)



The emergence of the climate crisis has been a significant concern across different branches of knowledge. The book, *Rethinking Environmental Education in a Climate Change Era: Weather Learning in Early Childhood*, addresses the need to reimagine environmental education in early childhood education. The reality of climate change, according to Rooney and Blaise, requires a rethinking and a critical approach to the discourse. The authors noted the escalating unjust damage of lands, forests, waterways, lives, and habitats of other species in the environment, which requires humans to rethink our impacts on the environment and acknowledge our interconnectedness to the Earth.

To rethink environmental education in early childhood education, Rooney and Blaise suggest alternative ways of engaging children in environmental education against the anthropogenic climate change approach, which is believed to be too complex to understand and difficult to include in everyday children's activities. The authors contend that engaging children in weather learning through outdoor exploration "opens-up potential for understanding our everyday human connections to wider climatic patterns and concerns" (Rooney & Blaise, 2022, p. 3).

We agree with the authors' position that engaging children in weather exploration can help foster their curiosity to explore more ecological issues. However, we argue that learning about the weather alone cannot completely achieve this goal. Instead, we need a reconceptualization in early childhood education that reimagines the curriculum across all subjects, which is dominantly human-centric. To reconceptualize, we argue that it requires integrating environmental ethics across the early year's curriculum that ensures sustainable practices, including developing a healthy attitude toward the earth and other species.

Research Approach

Several questions were raised by the authors, which guided the findings in the book. They include: "How can we live well together with more-than-human others in the climate worlds we inhabit together, and what responsibilities does this entail? How might we envisage learning that is ethically responsive and open to ways of living with others, including multi-species ecologies and ecosystems? How might learning with weather help to foster learning that is deeply connected and responsive to the climate challenges of our time? How might strategies such as listening to weather offer ways of thinking differently about human-weather relations?" (Rooney & Blaise, 2022, p. 9).

To answer these questions, Rooney and Blaise conducted an ethnographic study on the child-weather relationship with place and other species. Notably, the authors acknowledged the Indigenous custodians of the lands, the air, and the waterways where the research was conducted. The authors reflect on the cultures, histories, and weather embedded in the land and time in seeking out new possibilities in interacting with the place. This is noteworthy, as having the consciousness of understanding the long history from time immemorial of the land and place has been recognized by scholars as a commitment to the act of justice to the truth and rights of Indigenous people (Woods, Rene & Fitzsimons, 2022; Marsh & Green, 2020).

Data collection involved regular walks on the acres of grassy, lightly treed, urban lakeshore land around the university preschool. Children, teachers, and researchers engage in environmental exploration by walking alongside one another. The author proposed that walking methods exploration can be used to assess the impact on children's science literacy in how children come to understand species, life cycles, and children's physical agility as they scramble over rocks and climb branches of trees. Through the walking method, children and researchers were able to forge deeper connections with the climate and weather via walking, sensing, seeking out, and experimentation. Findings from the fieldwork were shared via photos and stories as told by the adults and the children. Giving voices to both the children and the adults emphasizes the pedagogy in thinking about how children live and learn with weather worlds.

Theoretical and Conceptual Frameworks

The authors use a post-development framework for rethinking early childhood environmental education in a changing climate. They argue that this approach emphasizes the complexities, multiplicities, subjectivities, contexts, provisionality, and uncertainties around climate change.

Rooney and Blaise contend that adopting this approach can potentially lead to the development of fresh pedagogical ideas that diverge from conventional ones. While post-developmentalism can draw from various perspectives, including poststructuralism, postcolonialism, Indigenous studies, Black studies, queer theory, feminisms, new materialisms, posthumanism, and more, as identified by the authors, we see it as most important in understanding that children can be agents of change in the climate change crisis.

The feminist theoretical lens was employed by the authors to rethink human relationships with the more-than-human world, drawing on conceptual insights from feminism and environmental humanities. Through the feminist lens, the authors critique and dismantle binary structures that perpetuate inequitable power dynamics (such as between man and woman, adult and child, and human/nature) and challenge basic assumptions of knowledge, truth, and power that underpin modern worldviews. The authors note that we humans are not hyper-separated from the biosphere; rather, we are an integral part of it. The belief that we have complete mastery and control over the environment is an illusion, according to Rooney and Blaise. While environmental degradation and exploitation of natural resources are human actions, we are also vulnerable to its effects, such as flooding and the rise in temperature.

Beyond feminist perspectives, the authors reflect on the work and influences of the poststructuralist, new materialist, and post-humanist theorists. The authors also draw from the perspectives of the Indigenous people, who are believed to have a knowledge system that has existed for millennia in managing climate. Rooney and Blaise argue that there is much to learn from Indigenous knowledge that looks beyond the boundary of Western science on the climate change crisis. To see through this lens in education, the authors contend that significant changes are needed in education if teachers are to develop pedagogies that move beyond the artificial binaries of nature-culture and human weather.

The authors' reliance on multiple perspectives is commendable. However, it is important to critically evaluate the extent to which these perspectives can be integrated into education to address the climate change crisis. While it is true that Indigenous knowledge systems have existed for millennia and provide valuable insights into the relationship between humans and nature, it is essential to recognize the diversity of Indigenous knowledge systems and not view them as a homogenous entity.

Significant Findings in the Book

The book contains insights and methods, approaches, and critical perspectives on human-weather relations and how this might help to position climate change in environmental education. Firstly, education needs to be reimaged to meet the environmental challenges of our time. Here, the authors argue that "education is suffering from "failure to imagine alternatives" (Rooney & Blaise, 2022, p. 4). This implies that environmental education should be grounded in environmental literacy, using multiple perspectives and looking beyond human-centric to understand the interconnections between natural systems and human activities, leading children to develop a sense of ecological citizenship.

Secondly, the authors propose a new approach to environmental education, which involves children learning alongside weather. Engaging children in this way encourages them to use their senses and establish connections to the climate world around them. The authors highlight that weather can invite children to participate actively in creating new weather worlds.

Thirdly, the authors contend that walking as a method of learning or doing research suggests an active strategy of doing, walking, writing, producing, and becoming with the weather as a paradigm for environmental education, going beyond just offering new ways of thinking. Another important component of this is that spending time in outdoor spaces can positively impact children's physical health, as they have more opportunities for physical activity and risky play. Additionally, outdoor areas with open-ended materials can stimulate children's curiosity and imagination, resulting in free play. Notably, outdoor learning can foster appreciation and respect for the natural world as an essential aspect of environmental education.

Another key idea from the book is that it is insufficient to rely only on science and technology to solve our environmental problems. Rather, an environmental culture that acknowledges the value of the natural world and our dependency on it is required to make sustainable decisions. Additionally, the authors suggest exploring and integrating interdisciplinary perspectives, such as Indigenous wisdom, into education to add to the body of knowledge in addressing the climate change crisis. Indigenous peoples are believed to have co-evolved with the land and have established healthy relationships with the environment and weather. Their perspective, the authors argued, can provide insight into implementing sustainable environmental practices.

Book Evaluation and Conclusions

In summary, the book is a valuable resource for educators, researchers, and parents interested in engaging young children in environmental learning. We strongly believe it achieved its purpose. Most of the author's arguments speak to the study. The authors advocate for a shift in environmental education that develops individual agencies for healthy human interaction with the natural world as a sustainable way to address the problem of climate change.

The study findings and research framework are robust and can be applied to further studies in environmental education in the climate change era. One of the strengths of the book is its focus on early childhood education, which is often overlooked in discussions about environmental education. The authors argue that early childhood is a critical period for learning and development. Engaging young children in weather-related activities can help them better understand environmental issues and their impact on the planet. Another strength of the book is its emphasis on making environmental education relevant and engaging to young children.

One limitation of the book is that it focuses primarily on weather-related activities, which may not be sufficient to engage young children in environmental learning fully. While weather learning is an essential aspect of the environment, many other factors, such as human behavior,

energy consumption, and resource depletion, contribute to climate change, which also requires a rethinking.

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<https://doi.org/10.4324/9781003150411>
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- Community opportunities
- Policy mandates or recommendations
- Environmental activities, education, or experiences
- Mechanisms or processes related to knowledge acquisition
- Attachment or maintenance of affective dispositions
- Abilities, behaviors, or skills development related to good decision making in a range of environmental contexts; and
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