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Research Article

Drama as symbolic nature pedagogy: Fostering environmental awareness and climate consciousness in preschoolers

Elif Öztürk[1], Rukiye Nur Saygılı Tavus[2]

Abstract: Early childhood is a critical window for cultivating children's environmental identities, yet urban preschool contexts often constrain direct access to nature. This qualitative case study examined how a drama-based environmental education program influenced preschool children's environmental awareness and emerging climate consciousness in Türkiye. Drawing on sociocultural perspectives on play and symbolic mediation, the study conceptualized environmental awareness as children's recognition and causal description of environmental elements and problems, and climate consciousness as value-laden, responsibility-oriented reasoning linking everyday actions to ecological and climate-related consequences. Participants were 41 children aged 61–73 months in a preschool in northern Türkiye. Over twelve weeks (24 sessions), the program used creative drama, role-play, and dialogic storytelling across seven themes: soil, water, air, biodiversity, energy, urbanization, and a livable world. Data were generated through pre- and post-intervention interviews with children, interviews with teachers and parents, and classroom observations, and were analyzed using reflexive thematic analysis guided by operational indicators. Children's initially fragmented and utilitarian understandings of environmental elements developed into more relational interpretations, and their awareness of environmental problems became more specific and causally articulated. Some children expressed responsibility-oriented reasoning indicative of emerging climate consciousness, although explicitly climate-linked reasoning was voiced by a smaller subset and was partly scaffolded by adults. Teacher and parent accounts suggested short-term transfer into classroom routines and home practices. The study distinguishes environmental awareness from climate consciousness as developmentally appropriate constructs and conceptualizes drama as a symbolic nature pedagogy through which children can rehearse environmental responsibility in classroom-bound contexts.

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Introduction

Environmental learning in early childhood unfolds at the intersection of cognitive, emotional, social, and moral development. The preschool years represent a particularly consequential period in which children begin to make sense of human–nature relations and to form early dispositions of care, responsibility, and belonging within ecological systems. Research consistently shows that educational experiences which invite meaning-making, nurture empathy, and scaffold children's emerging sense of agency can transform diffuse curiosity into more coherent understandings of environmental phenomena (Cutter-Mackenzie & Edwards, 2013). At the same time, early childhood educators face a persistent pedagogical challenge: how to engage with complex environmental issues—such as pollution or climate change—in ways that are developmentally appropriate, ethically sensitive, and emotionally supportive, avoiding fear or eco-anxiety while fostering hopeful and prosocial orientations (Ojala, 2016; Sobel, 2008). This tension is particularly salient in preschool contexts, where children's reasoning capacities remain closely intertwined with affect, imagination, and social interaction.

[1] Giresun University, Faculty of Education, Department of Early Childhood Education, Giresun, Türkiye; Indiana University Bloomington, Department of Curriculum and Instruction, Indiana, USA, e-mail: elif.ozturk@giresun.edu.tr, ORCID: https://orcid.org/0000-0002-3764-4526

[2] Gazi University, Institute of Educational Sciences, Department of Early Childhood Education, Ankara, Türkiye, e-mail: rukiyenursaygili@gmail.com, ORCID: https://orcid.org/0009-0006-7468-5315

Corresponding author: Elif Öztürk

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Within this landscape, scholars increasingly emphasize the importance of children's developing environmental identity (Thomashow, 1995) during the early years. Early childhood has been identified as a critical period for establishing nature connection and a sense of ecological belonging that may shape later pro-environmental orientations (Barrable & Booth, 2020). At the same time, research in early childhood education for sustainability (ECEfS) has drawn attention to a longstanding conceptual gap regarding how environmental learning in the early years is defined, operationalized, and evaluated (Davis, 2009). While there is broad agreement that early engagement matters, there is less clarity about what kinds of environmental learning can reasonably be expected in preschool and how such learning should be interpreted within children's developmental realities.

A substantial body of research demonstrates that direct contact with nature—through outdoor experiences, unstructured play, and encounters with biodiversity—supports children's curiosity, emotional connection, and pro-environmental orientations (Ernst & Burcak, 2019; Kahn, 2002; Louv, 2008; Richardson et al., 2021; Soga & Gaston, 2016). However, preschool classrooms are often constrained by urbanization, time, safety concerns, seasonality, and institutional policies. These constraints raise a critical pedagogical question that has been widely discussed within ECEfS scholarship: Can meaningful, nature-related environmental learning occur within classroom-bound settings, and if so, through what pedagogical mediations? (Ärlemalm-Hagsér & Elliott, 2020).

The present study responds to this question by positioning drama as a form of symbolic nature pedagogy. Rather than assuming that effective environmental education must rely exclusively on continuous outdoor immersion, this approach leverages drama to symbolically render the more-than-human world present within the classroom. Through scripted vignettes, role-play, and guided dialogue, children encounter characters faced with everyday environmental dilemmas—whether to waste or conserve water, whether to discard or recycle plastic, or how to keep the air clean in a city. These dramatizations are not intended as substitutes for outdoor learning; instead, they function as pragmatic complements that introduce language, perspectives, and dispositions which may later be enacted in outdoor, home, or community contexts (McNaughton, 2010).

This positioning addresses two recurring debates in the literature. First, it challenges the assumption that environmental education's legitimacy depends solely on outdoor implementation, an assumption that can inadvertently marginalize classrooms with limited access to natural environments (Ärlemalm-Hagsér & Elliott, 2020). Second, it responds to concerns that early environmental education may overemphasize crisis narratives, leading to anxiety or helplessness rather than agency (Ojala, 2016; Sobel, 2008). Drama offers a structured and emotionally safe space in which children can rehearse responses to environmental dilemmas, experiment with roles, and articulate reasons for their choices. In doing so, it translates abstract notions—such as responsibility, reciprocity, and care—into concrete classroom speech and embodied action.

Framing drama as symbolic nature pedagogy aligns with broader conceptions of environmental literacy, which emphasize not only knowledge but also dispositions and action tendencies that enable individuals to interpret and respond ethically to socio-ecological phenomena (North American Association for Environmental Education, 2011). In early childhood, play-rich and guided experiences constitute a primary pathway into this developmental arc (Cutter-Mackenzie & Edwards, 2013). By rendering environmental relations tangible, discussable, and emotionally salient indoors, drama-based practices may also mitigate the "extinction of experience"—the gradual loss of everyday human–nature interactions described by Soga and Gaston (2016, 2020). Within the broader international context, early childhood education is increasingly recognized as a critical site for advancing education for sustainable development, as articulated in the United Nations Sustainable Development Goals (SDGs)—particularly SDG 4.7, which emphasizes sustainability-oriented learning, and SDG 13, which calls for early engagement with climate action (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021; United Nations General Assembly, 2015). This agenda is also a matter of children's rights, since young children are among those most exposed to the consequences of climate change (United Nations Children's Fund [UNICEF],

2021).

Drama as Symbolic Mediation

The study draws on sociocultural perspectives that regard play and imagination as leading activities in early childhood. Vygotsky (1967) argued that in pretend play the child acts within an imagined situation in which meaning is separated from the immediate object, so that the rules and relations implicit in everyday life become visible and open to negotiation. Symbolic tools such as language, gesture, story, and role mediate the child's relation to the world and allow ideas that are not yet available in independent thinking to be rehearsed together with others (Vygotsky, 1978). Bruner's (1986) account of the narrative mode of thought complements this view: children make sense of events through stories organized around intentions, dilemmas, and consequences. From this perspective, drama is not merely a motivating classroom activity but a mediational means through which children can take up positions, try out choices, and give reasons within a shared imagined situation.

In Türkiye, creative drama has a well-established place in early childhood education and teacher education, where it is commonly defined as the enactment of an experience, idea, or event by a group through improvisation and role-play, drawing on participants' own lives (Adıgüzel, 2006; San, 1990). International research has examined the contribution of theatre and drama to young children's language, perspective-taking, and imagination (Mages, 2018) and has shown how educational drama can open spaces for ethical deliberation in education for sustainable development (McNaughton, 2010). These qualities are directly relevant to environmental and climate education, in which children are asked to consider beings, places, and consequences that are not immediately present.

Symbolic Nature Pedagogy

Building on these perspectives, we use the term *symbolic nature pedagogy* to describe classroom practices that make the more-than-human world present through symbolic means (stories, puppets, role-cards, costumes, and bodily enactment) so that children can relate to natural elements and beings, and to the consequences of human action upon them, when direct encounters are limited. In the present study, the concept was operationalized through three design features: (a) *symbolic representation*, in which soil, water, air, animals, plants, and energy sources were given a voice or a body within the drama (e.g., a puppet gardener, species role-cards, sun and wind capes); (b) *dilemma-based positioning*, in which children were invited to choose between alternative courses of action and to justify their choices (e.g., leaving the tap running or turning it off); and (c) *dialogic reflection*, in which enacted choices were discussed and connected to children's everyday lives at school and at home (Alexander, 2008). Table 1 shows how these features were translated into the drama devices used for each theme.

Symbolic nature pedagogy is not proposed as a substitute for direct experience. Research consistently indicates that regular contact with nature supports children's connection to, and care for, the natural world (Chawla, 2020; Sobel, 2008; Wilson, 2018). The concept rather names a complementary pathway through which language, perspectives, and dispositions can be introduced in the classroom and later extended outdoors. It also has limits. When nature is represented through human voices and scripted characters, there is a risk of reproducing a human-centered view in which the more-than-human world matters only insofar as it serves people. Common worlds scholarship reminds us that children's relations with other species are also shaped by vulnerability, interdependence, and uncertainty (Taylor & Pacini-Ketchabaw, 2015). The drama scenarios therefore sought, where possible, to position animals, plants, and places as having needs of their own rather than solely as resources (see Table 1).

Environmental Awareness, Climate Consciousness, and Response-ability

Within this framework, the study makes an analytic distinction between environmental awareness and climate consciousness. Environmental awareness refers to children's recognition and basic understanding of environmental elements, processes, and problems—for example, recognizing that water is necessary for living beings, that air quality affects health, or that plastic waste can be sorted for recycling. Climate consciousness extends beyond recognition toward value-laden engagement, encompassing

emerging responsibility, perspective-taking, and an early sense that one's actions matter in relation to broader ecological patterns (Chawla, 2020; Jickling & Wals, 2013). Although these constructs are closely intertwined, maintaining a conceptual distinction allows for a more developmentally realistic interpretation of what short-term educational interventions can plausibly influence in early childhood settings. In this study, climate consciousness was understood as a continuum rather than a single attainment. At one end, children justify environmental actions with reference to care for others (e.g., "We should save water so animals can drink"); at the other, they connect such actions to climate-related processes such as warming or energy use (e.g., "We should not waste energy because it makes the world hotter for animals"). Keeping both ends in view makes it possible to recognize responsibility-oriented reasoning as a developmental foundation for climate consciousness without equating it with explicit climate understanding.

In preschool contexts, these constructs are differentiated less by the accumulation of factual knowledge than by the quality of children's reasoning and positioning. Environmental awareness is typically evident when children name environmental elements or describe observable cause–effect relations (e.g., "Water is for drinking," "Smoke is bad"). Climate consciousness begins to emerge when children articulate reasons grounded in care, responsibility, or moral concern (e.g., "We should save water so animals can drink," "Dirty air makes people sick"). Clarifying this distinction is particularly important for interdisciplinary audiences, as it underscores that climate consciousness in early childhood should not be equated with abstract scientific understanding or political awareness, but rather with the early formation of ethical orientations and relational thinking appropriate to young children's developmental capacities.

The distinction matters for climate change education for reasons that go beyond the classification of children's responses. First, it guards against reducing early climate education to the transmission of facts about distant, large-scale phenomena such as melting glaciers or rising seas. Such information may increase awareness, but without opportunities to act and to make sense of one's feelings it may also generate worry and helplessness (Ojala, 2016; Pihkala, 2020). Second, the two constructs call for different pedagogical conditions: awareness can be supported through information and observation, whereas consciousness appears to require relational, dialogic, and value-laden spaces in which children can take positions and give reasons (Hedefalk et al., 2015; Rousell & Cutter-Mackenzie-Knowles, 2020). Third, the distinction helps researchers and practitioners to judge more realistically what a short-term program can achieve, rather than reading every environmentally "correct" statement as evidence of climate understanding. This is particularly relevant in the Turkish context. Research with Turkish preschool children has reported that their ideas about sustainability tend to center on the environmental dimension, especially recycling and resource saving (Kahriman-Öztürk et al., 2012), and a systematic review of education for sustainability in early childhood has noted that the field has concentrated largely on environmental content and on children's knowledge and attitudes (Güler Yıldız et al., 2021). The value-laden dimension of young children's engagement therefore remains comparatively under-examined.

Finally, the notion of *response-ability* offers a way of naming what the drama sessions sought to cultivate. Haraway (2016) uses the term to describe the capacity to respond to others, human and more-than-human, with attention and care; this capacity is cultivated within relationships rather than possessed by individuals. In early childhood education, Weldemariam (2020) has shown how children's encounters with dying bees can generate affect and response-abilities that go beyond knowledge about environmental problems. At the same time, a focus on children's responsibility carries the risk of placing the burden of environmental change on individual behavior, such as turning off taps or lights, while leaving the collective and structural dimensions of the climate crisis out of view (Chawla & Cushing, 2007; Hayward, 2012). The present study therefore approaches children's responsibility-oriented talk as an early and partial form of climate consciousness that needs to be connected, over time, to shared and collective forms of action.

Guided by this framework, the study addressed the following research questions: (1) How do preschool children describe fundamental environmental elements before and after participating in a drama-based environmental education program? (2) How does children's awareness of environmental

problems change over the course of the program? (3) In what ways, and to what extent, do children express emerging climate consciousness? In addition, teacher and parent perspectives were examined to explore whether and how children's learning was reflected in classroom routines and home practices.

Contribution of the Study

Against this conceptual and pedagogical backdrop, the present study offers three interrelated contributions to the field of childhood, education, and society. First, it clarifies the distinction between environmental awareness and climate consciousness in early childhood and operationalizes these constructs in developmentally appropriate terms, providing a lens that helps educators design for, and researchers interpret, the value-laden dimension of young children's climate learning rather than its factual content alone. Second, it advances the notion of drama as a symbolic nature pedagogy, illustrating how classroom-based, play-rich practices can engage children with environmental and climate-related ideas even in contexts where direct access to nature is constrained. Third, through a qualitative case study design, the study provides a carefully delimited, context-sensitive account of what such an intervention can and cannot claim within a twelve-week period, foregrounding children's evolving articulations, relational reasoning, and responsibility-oriented talk.

Method

Research Design

This study was situated within an interpretivist paradigm, which conceptualizes knowledge as socially constructed, contextually embedded, and co-produced through interaction rather than objectively discovered. An interpretivist stance is particularly appropriate for early childhood research, as it foregrounds children's meaning-making processes and recognizes that their perspectives are mediated by social interaction, cultural tools, language, and developmental stage (Schwandt, 2014). Within this epistemological framework, the study sought to understand *how* children made sense of environmental and climate-related ideas within a specific pedagogical context, rather than to measure predefined outcomes.

Accordingly, the study employed a qualitative case study design (Yin, 2014). Case study methodology enables in-depth exploration of a bounded system—in this instance, a single preschool implementing a drama-based environmental education program—allowing close attention to context, process, and meaning. Rather than striving for statistical generalization, the aim was to generate rich, "thick description" (Geertz, 1973) of children's evolving environmental awareness and emerging climate consciousness within a particular socio-cultural and pedagogical setting. This design was well suited to the study's focus on interpretation, articulation, and relational reasoning as expressed through talk, play, and interaction.

Setting and Participants

The research was conducted at a preschool in northern Türkiye. The preschool was selected purposefully due to its openness to innovation in environmental education and its adequate infrastructure for project- and play-based learning. A total of 42 children (23 girls, 19 boys) aged 61–73 months (M = 65.5 months) initially participated in the study.

Criterion sampling (Patton, 2015) was used to identify participants who met the following conditions: (a) being older than 60 months, (b) consistent enrollment throughout the academic year, and (c) typical developmental progression. One child was excluded from the analysis due to extended absence during the intervention period, resulting in a final analytic sample of 41 children. Relative homogeneity in developmental level supported more coherent interpretation of learning processes and reduced confounding variation linked to age-related differences in language and reasoning.

Intervention and Implementation

The intervention was designed as a twelve-week drama-based environmental education program

structured around seven interrelated environmental themes: soil, water, air, biodiversity, energy, urbanization, and a livable world (see Table 1). Each theme was introduced through a short, age-appropriate story authored by the research team and subsequently reviewed and validated by three experts: a children's literature specialist, a Turkish language educator, and an early childhood education faculty member. This validation process ensured narrative coherence, linguistic appropriateness, and pedagogical alignment with early childhood learning principles.

Table 1

Thematic Map of the Intervention and Indicative Drama Devices

Environmental theme	Core learning focus	Drama device and prompt	Indicative child talk (post-intervention)
Soil	Living systems depend on soil; caring for ground life	Hand-puppet gardener loses plants when soil is wasted; children advise how to care for soil	"Soil helps plants and little animals live; we shouldn't throw trash on it."
Water	Shared necessity; conservation habits	Two characters argue about running tap vs. turning it off; class votes and justifies	"We turn it off when brushing; animals need water too."
Air	Clean air and health; emissions	City scene with "traffic hats" and "trees" negotiating space	"Too many cars make smoke; trees help us breathe."
Biodiversity	Valuing difference among living kinds	"Who belongs in this meadow?" role-cards for insects, birds, plants	"Different plants and animals are important together."
Energy	Sources and consequences; saving	Sun and wind capes vs. "coal cloak"; choices dramatized	"Sun and wind don't make smoke; lights off saves energy."
Urbanization	Trade-offs in city growth; green spaces	Block-city build with green cards limited; class decides layout	"Parks make cities healthier; not only buildings."
Livable world	Normative horizon; shared responsibility	"Message to future children" circle time	"We keep the world clean so others can live well."

To enhance transparency regarding the pedagogical structure of the intervention, Table 1 presents a thematic map of the seven environmental themes alongside the corresponding drama devices and indicative child talk observed during implementation. The table is intended to illustrate how abstract environmental concepts were translated into developmentally appropriate, symbolically rich classroom practices, rather than to summarize findings.

Building on this thematic structure, Table 2 outlines the logic model of the intervention, specifying the intended immediate learning focus and anticipated proximal effects associated with each theme. This logic model reflects the pedagogical design assumptions guiding the intervention and does not represent measured outcomes or causal claims.

Table 2

Logic Model of the Intervention

Theme	Input/Activity	Intended immediate outcome	Anticipated proximal effect
Soil	Story + puppet drama	Children describe functions of soil	Increased awareness of ecological interdependence
Water	Role-play with "leaking tap"	Children articulate conservation practices	Transfer of habits to classroom/home
Air	Traffic/trees drama	Children identify sources of pollution	Sensitivity to urban environmental quality
Biodiversity	Role-cards for species	Children recognize importance of variety	Valuing difference in natural systems
Energy	Renewable vs. fossil role-play	Children compare energy sources	Consciousness of sustainability choices
Urbanization	Block-building simulation	Children debate city planning	Awareness of trade-offs in growth vs. green
Livable world	Circle "message to future"	Children express normative visions	Sense of shared responsibility

Stories were enacted through creative drama, role-play, and interactive reading activities conducted in the children's regular classrooms. Each session followed the three-phase structure widely used in creative drama practice (Adıgüzel, 2006): (a) a warm-up phase, in which movement and sensory games

introduced the element or problem of the day; (b) an enactment phase, in which the story was read aloud and children took on roles through puppetry, role-cards, or improvisation; and (c) an evaluation phase, conducted as a circle discussion, in which children reflected on the choices made in the drama and related them to their own experiences. For example, within the water theme, two characters debated whether to leave a tap running or turn it off, and children were invited to dramatize both choices and discuss their consequences. Across sessions, emphasis was placed on dialogic engagement and embodied exploration rather than didactic instruction. Although classroom-based, the activities symbolically represented natural processes and environmental dilemmas, aligning with research highlighting the importance of imaginative and experiential engagement for fostering environmental connectedness (Cutter-Mackenzie-Knowles & Rousell, 2019; McNaughton, 2010). Sessions were held twice a week over twelve weeks (24 sessions in total), each lasting approximately 40–45 minutes, and each theme was addressed across consecutive sessions. The sessions were led by the second author, a preschool teacher trained in creative drama, with the classroom teachers present. The sequence progressed deliberately from more concrete elements (soil, water, air) toward more abstract and integrative concepts (urbanization, livable world), in order to scaffold children's understanding from basic awareness toward emerging consciousness.

Climate change was not introduced as a separate theme. Climate-related ideas were brought in mainly through the energy and livable world themes, in which the contrast between the "coal cloak" and the sun and wind capes, and the "message to future children" circle, invited children to consider how everyday choices such as saving energy relate to the warming of the Earth and to the lives of others in the future. In the evaluation phase of these sessions, the implementer used open questions to help children move from the concrete dilemma enacted in the drama to this wider scale. The step from local environmental dilemmas to climate-related reasoning was therefore, in part, scaffolded by adults, a point we take into account when interpreting the findings.

Data Collection

The analytic distinctions guiding the coding process were aligned with the pedagogical logic articulated in Tables 1 and 2, while remaining grounded in the inductive patterns emerging from the data. Multiple qualitative data sources were employed to enable a rich and triangulated understanding of children's environmental learning. Semi-structured interviews with children were conducted both before and after the intervention to capture shifts in their recognition of environmental elements, environmental problems, and value-laden reasoning. Interview questions were designed to be developmentally appropriate and open-ended, encouraging explanation rather than eliciting yes/no responses. Prompts such as *"Why is clean air important?"* and *"What happens if we waste water?"* invited elaboration and revealed both factual awareness and emerging climate consciousness.

To illustrate the interview structure, sample questions included: *"What happens to the water if we leave the tap running for a long time?"* (targeting awareness of cause–effect relations), and *"Why is it important to take care of the trees in our city?"* (eliciting value-oriented reasoning). These prompts were intentionally phrased to support children's authentic explanations rather than reproduction of adult discourse.

Child interviews were conducted individually by the first author in a quiet and familiar area of the school during the week before and the week after the intervention, and lasted approximately 10–15 minutes. The same interview guide was used in both rounds, and follow-up prompts (e.g., "Why do you think so?", "What would happen then?") were used to invite elaboration. Interviews were kept conversational, and children were reminded that there were no right or wrong answers.

Complementary semi-structured interviews were conducted with two classroom teachers to gain insight into children's engagement, conceptual development, and observed behavioral changes during everyday classroom routines. In parallel, 22 parents were interviewed to explore the extent to which learning transferred into home contexts, particularly with respect to practices such as waste sorting, energy conservation, and water use. Teacher and parent interviews were conducted after the intervention and lasted approximately 20–30 minutes. Questions focused on concrete changes the participants had noticed in children's talk and everyday practices (e.g., "Have you noticed any change in how your child talks about

water, energy, or waste at home? Could you give an example?").

In addition, systematic classroom observations were carried out throughout the intervention period. Observations were conducted by both researchers during all sessions. Researchers used a structured observation form focusing on three dimensions: environmental awareness, climate consciousness, and children's affective and cognitive responses during drama activities. For each dimension, the form contained open fields in which the observer recorded children's verbatim statements, the phase of the session in which they occurred, and non-verbal indicators of engagement such as taking on a role, proposing an alternative action, or withdrawing from the activity. All interviews were audio-recorded and transcribed verbatim. Observational data were documented in detailed field notes, which were subsequently incorporated into the analytic dataset.

Data Analysis

Data were analyzed using reflexive thematic analysis following the phases outlined by Braun and Clarke (2006). Analysis began with a period of familiarization, during which researchers repeatedly read interview transcripts and field notes to develop an overall sense of the data corpus. Initial codes were then generated inductively, allowing patterns to emerge from children's own language and actions while remaining informed by the conceptual distinction between awareness and consciousness guiding the study.

For instance, utterances involving the naming or description of environmental elements (e.g., water, soil, air), or of observable cause–effect relations, were coded as environmental awareness, whereas statements incorporating moral reasoning or responsibility (e.g., *"We should save water so animals can drink"*) were coded as climate consciousness. Consistent with the continuum described in the conceptual framework, statements coded as climate consciousness were further distinguished according to whether they connected responsibility to climate-related processes (e.g., warming, energy use, melting ice) or remained at the level of local environmental care. The operational indicators used for each construct are presented in Table 3. These initial codes were then collated into potential sub-themes such as *utilitarian understanding*, *recognition of interconnection*, and *expression of responsibility*.

An iterative process of reviewing and refining themes followed, involving the merging, differentiation, and conceptual clarification of thematic categories to ensure coherence and analytic fit with the research questions. The progression from codes to themes and from awareness to consciousness is summarized in Table 3. Throughout this process, analytic decisions were documented to maintain transparency and reflexivity.

Table 3

Operational Indicators and the Progression From Sub-Themes to Themes

Construct	Operational indicator in children's talk	Sub-theme	Theme (Findings section)
Environmental awareness	Naming environmental elements and describing their function (e.g., "Water is for drinking.")	Utilitarian understanding	Perceptions of fundamental environmental elements
Environmental awareness	Describing relations among elements and living beings, or cause–effect links between human action and environmental harm (e.g., "If garbage is not put in the bin, it pollutes the soil and water.")	Recognition of interconnection	Perceptions of fundamental environmental elements; Awareness of environmental problems
Climate consciousness (care-based)	Justifying an action with reference to care, obligation, or the needs of others, human or non-human (e.g., "We must not waste water because animals and people both need it.")	Expression of responsibility	Awareness of environmental problems; Emerging climate consciousness
Climate consciousness (climate-linked)	Connecting responsibility to climate-related processes or to future and collective consequences (e.g., "We should not waste energy because it makes the world hotter for animals.")	Expression of responsibility (climate-linked)	Emerging climate consciousness

To strengthen analytic rigor, two researchers independently coded the same subset of transcripts. Inter-rater agreement was high ($\kappa = .85$; Landis & Koch, 1977), indicating strong consistency in coding

decisions. Discrepancies were resolved through discussion, leading to refinement of the coding framework. In line with the reflexive orientation of the analysis (Braun & Clarke, 2006), double coding was used not to establish a single "correct" reading of the data but to prompt discussion of alternative interpretations and to sharpen the boundaries between codes. An audit trail was maintained to document the analytic pathway from raw data to final themes.

Trustworthiness

Trustworthiness was addressed using the framework proposed by Lincoln and Guba (1985), encompassing credibility, dependability, confirmability, and transferability. Credibility was enhanced through methodological triangulation across data sources (children, teachers, parents) and methods (interviews, observations, field notes). Prolonged engagement in the field prior to and during data collection allowed researchers to build rapport with children and to observe naturally occurring interactions. Peer debriefing sessions were conducted with two colleagues experienced in qualitative research in early childhood education, providing external scrutiny of analytic decisions. In addition, a developmentally appropriate form of member checking was employed: after interviews, researchers paraphrased key ideas in simple language and asked children to confirm whether their meanings had been understood correctly.

Dependability was supported through systematic documentation of all stages of the research process. Detailed records were maintained, including observation protocols, interview guides, raw transcripts, coding matrices, and analytic memos, ensuring a clear chain of evidence from data to findings. Independent coding by two researchers and the resulting inter-rater agreement ($\kappa = .85$) further supported methodological consistency.

Confirmability was addressed through ongoing reflexivity. Throughout the study, reflexive memos were kept to document researchers' assumptions, disciplinary background in environmental education, and potential interpretive biases, thereby supporting transparency in the analytic process. Transferability was strengthened through the provision of thick description of the research context, including the preschool setting, classroom environment, socio-cultural characteristics of northern Türkiye, and participant profiles. While the study is bounded by its single-site case study design, the depth of contextual detail enables readers to assess the applicability of the intervention model to comparable early childhood settings.

Taken together, these strategies were used to strengthen the trustworthiness of the study. By making explicit the procedures used to ensure credibility, dependability, confirmability, and transferability, the study aims to provide findings that are trustworthy within their immediate context and informative for broader discussions in early childhood environmental education.

Ethics

This study was conducted in accordance with the ethical standards for research involving human participants. Ethical approval was obtained from the Giresun University Ethics Committee (decision dated 11 May 2022, No. 22/013). Written informed consent was obtained from parents prior to participation. Children's identities were protected through the use of alphanumeric codes (e.g., C1, C2), ensuring confidentiality. Participation was entirely voluntary, and children were informed that they could withdraw at any stage without any negative consequences. All activities were designed to be developmentally appropriate, playful, and non-threatening, thereby minimizing any potential stress or discomfort.

Parental consent was complemented by children's own assent, which we treated as an ongoing process rather than a single event (Alderson & Morrow, 2011; Dockett & Perry, 2011). Before each interview, children were told in simple language what the conversation was about and that the recorder could be switched off whenever they wished, and the interview began only when the child agreed. During drama sessions and interviews, children's continued willingness to participate was monitored through verbal and non-verbal cues, such as turning away, remaining silent, or asking to return to play. Children who showed reluctance could watch rather than take part, or end the interview, and these choices were respected.

We were also mindful of the power relations inherent in adult-led research with young children (Punch, 2002). Because one of the researchers implemented the program, children may have wished to please a familiar adult by offering answers they thought were expected. To reduce this risk, interviews were framed as conversations in which there were no right or wrong answers, and children's statements were read against teacher and parent accounts and observational data. Our backgrounds in early childhood education and environmental education also shaped what we noticed in the data; reflexive memos (see Trustworthiness) were used to record these assumptions (Berger, 2015).

Finally, environmental and climate topics are not neutral in family life. Practices such as recycling, walking instead of driving, or reducing energy use are not equally available to all families, as they depend on housing, transport, income, and local infrastructure. To avoid positioning some children or families as less responsible than others, the drama scenarios and interview questions focused on shared, low-cost practices and did not compare individual households. We also recognize that an emphasis on individual actions may obscure the collective and structural nature of environmental problems (Hayward, 2012), an issue we return to in the Discussion.

Findings

The findings are presented in accordance with the three research questions guiding the study: (1) children's perceptions of fundamental environmental elements, (2) their awareness of environmental problems, and (3) their emerging climate-related consciousness. A final subsection presents teacher and parent perspectives in order to triangulate children's accounts and to examine the extent to which classroom learning was reflected in everyday practices. In line with the conceptual framework, findings are interpreted with explicit attention to the distinction between environmental awareness (cognitive recognition and description) and climate consciousness (value-laden reasoning and responsibility-oriented engagement).

Children's Perceptions of Fundamental Environmental Elements

Prior to the intervention, children's statements regarding core environmental elements such as soil, water, and air were predominantly concrete and utilitarian in nature. Soil was commonly described as "for plants," water as "for drinking," and air as "what we breathe." These responses reflected functional recognition of environmental elements but limited articulation of interconnections or broader ecological relationships.

Following the drama-based intervention, children's responses became more relational and integrative. As illustrated in Table 4, children increasingly articulated links between environmental elements and living systems, and began to recognize the roles of biodiversity and energy alongside more familiar concepts. For instance, soil was no longer described solely as a medium for plant growth, but also as a habitat for living organisms; water was framed as a shared necessity for humans and animals; and air was discussed in relation to health and pollution.

Table 4

Children's Understanding of Environmental Elements Before and After the Program

Theme	Pre-intervention response (awareness)	Post-intervention response (awareness + consciousness)
Soil	"Plants grow in soil."	"Soil helps plants and animals live; worms and bugs need it too."
Water	"Water is for drinking."	"We must not waste water because animals and people both need it."
Air	"Air helps us breathe."	"Too many cars make smoke and then we can't breathe well."
Biodiversity	"Birds live in trees."	"Different plants and animals are important together; if one goes, others are sad."
Energy	Rarely mentioned	"Sun and wind don't make smoke, but coal does; we should use clean energy."

Taken together, these shifts suggest that the intervention supported children in moving beyond isolated naming of environmental elements toward an emerging understanding of ecological interdependence. While these responses remained developmentally grounded and concrete, they reflect a

progression from basic awareness toward early responsibility-oriented reasoning embedded within children's own explanations. The excerpts presented in Tables 4 and 5 were selected to illustrate the dominant patterns identified in the analysis; they should not be read as indicating that every child reached the same level of articulation by the end of the program.

Children's Awareness of Environmental Problems

Before the program, children tended to describe environmental problems in vague or generalized terms, such as "trash" or "dirty air," with limited reference to causes or consequences. Environmental degradation was typically framed as an undesirable condition rather than as a process linked to human action.

After participation in the drama sessions, children's explanations became more specific and causal. As summarized in Table 5, children began to articulate how particular actions led to environmental harm. For example, one child explained, *"Garbage pollutes the soil, so we should put it in the trash can,"* while another noted, *"If people throw things in the river, the fish cannot live."* These statements indicate an increased capacity to link environmental problems with human behaviors and their consequences.

Table 5

Children's Awareness of Environmental Problems

Problem area	Example pre-intervention statement	Example post-intervention statement
Waste	"Trash is dirty."	"If garbage is not put in the bin, it pollutes the soil and water."
Recycling	Rarely mentioned	"Paper and plastic should be recycled because it protects nature."
Pollution	"Smoke is bad."	"Smoke from cars makes the air dirty; walking is better."
Urbanization	Not mentioned	"Cities need parks, not just buildings."

Teachers reported observing similar patterns during classroom activities, particularly in dramatized problem-solving contexts. Children spontaneously identified unsustainable practices enacted by characters during role-play and proposed alternative actions. Although some expressions echoed adult discourse, the frequency, contextual appropriateness, and spontaneity of children's contributions suggest that these ideas were not merely reproduced but were actively taken up and applied within meaningful classroom interactions.

Children's Emerging Climate Consciousness

Climate-related issues constituted the least articulated domain prior to the intervention. Few children were able to explain what climate change meant, and those who attempted to do so often equated it with everyday weather variation. This pattern is consistent with the abstract and large-scale nature of climate concepts relative to preschool children's developmental capacities.

By the end of the program, however, several children expressed ideas indicative of emerging climate consciousness. Some articulated simplified but meaningful links between climate processes and environmental outcomes, such as *"If the climate changes, glaciers might melt,"* or *"When the Earth gets too hot, the seas rise."* Importantly, a subset of children connected these processes to human responsibility, as illustrated by statements such as *"We should not waste energy because it makes the world hotter for animals."*

These examples reflect a progression from awareness—recognizing that climate-related changes occur—to consciousness, in which climate issues are framed in terms of moral responsibility and collective consequences. While children's reasoning remained age-appropriate and limited in scope, the intervention provided symbolic narratives and dialogic spaces that enabled them to connect local practices (e.g., energy use) with broader environmental implications. It should be noted, however, that explicitly climate-linked statements were voiced by fewer children than responsibility-oriented statements about local environmental care, and that some of the ideas children drew on (e.g., melting glaciers, rising seas) are likely to have come from adult sources, whether the program itself, family conversations, or the media. These statements therefore indicate what children were able to articulate with adult support, rather than independently constructed explanations of climate change.

Teacher and Parent Perspectives

Teacher and parent accounts corroborated children's reported learning and provided insight into short-term behavioral transfer beyond the classroom. Teachers described observable changes in children's daily routines and discourse. During activities such as handwashing or classroom cleanup, children reminded peers to close taps, turn off lights, and separate waste for recycling. One teacher recalled, *"During handwashing, a child told the others to close the tap so water would not be wasted."*

Parents echoed these observations, noting that children frequently brought ideas from the program into home contexts. One parent reported, *"My daughter told me that smoke from cars makes the air dirty and said we should walk instead."* Such accounts suggest that children not only articulated environmental ideas during structured activities but also enacted them within everyday decision-making, at least in the short term.

Across data sources, the findings indicate that the drama-based intervention supported children in moving from concrete, fragmented understandings toward more relational and responsibility-oriented conceptions of environmental issues. Environmental awareness expanded to include more specific and causal explanations of problems, while early climate consciousness emerged through children's ability to link human actions with broader environmental consequences. Teacher and parent perspectives reinforced these patterns and pointed to near-term transfer into daily practices. While the study does not claim long-term or generalized effects, the findings underscore the potential of drama pedagogy to foster early orientations toward environmental sustainability within the developmental realities of preschool classrooms.

Discussion

This study examined how a drama-based environmental education program shaped preschool children's environmental awareness and emerging climate consciousness. Overall, the findings suggest a consistent movement from fragmented, utilitarian descriptions of environmental elements toward more relational and integrated understandings. Children's awareness of environmental problems became more specific and causal, and early climate consciousness emerged when children linked human actions to moral responsibility and collective consequences. Teacher and parent testimonies further indicated short-term behavioral transfer into classroom routines and home practices, suggesting that children not only verbalized environmental ideas during structured sessions but also mobilized them in everyday contexts.

A central contribution of the study lies in the analytic distinction between awareness and consciousness as a developmentally sensitive lens for interpreting children's responses. Awareness was reflected in children's increasingly accurate recognition and description of environmental elements and problems (e.g., naming soil, water, and air; identifying pollution), whereas consciousness became visible when children's talk included evaluative stances, responsibility, and care (e.g., linking energy conservation to the wellbeing of animals). This distinction resonates with Chawla's (2020) argument that early childhood experiences can nurture dispositions of responsibility well before children can sustain abstract scientific explanations, and it aligns with Jickling and Wals (2013), who emphasize moral engagement as a core dimension of meaningful environmental learning. Importantly, the present study does not interpret these shifts as evidence of durable competencies or generalized problem-solving skills. Rather, the findings suggest that drama offered symbolic and dialogic resources through which children could rehearse responsibilities and articulate value-laden reasons—an interpretation consistent with broader calls in early childhood environmental education to foreground situated meaning-making and relational learning processes rather than narrow outcome claims (Ardoin & Bowers, 2020). This pattern also resonates with research in Türkiye showing that preschool children's ideas about sustainability tend to center on familiar environmental practices such as recycling and resource saving (Kahriman-Öztürk et al., 2012); the present findings suggest that drama may offer one way of extending such practice-based ideas toward reasons grounded in care and shared consequences.

While environmental awareness shifted in relatively robust ways, the climate dimension revealed a

more complex developmental pattern. Initially, climate change was largely absent from children's explanatory repertoires or was conflated with everyday weather variation. By the end of the program, some children produced statements indicating emergent climate consciousness—such as referencing melting glaciers or sea-level rise—and, more importantly, a subset connected human responsibility to these processes (e.g., conserving energy to protect animals). These patterns are significant because they suggest that preschool-aged children can begin to form moral and relational orientations toward climate issues even when their explanatory models remain partial and developmentally constrained. This aligns with scholarship emphasizing that climate change education is not solely a matter of transmitting factual knowledge but also involves emotional engagement, hope, and meaning-making processes that support agency rather than despair (Ojala, 2016, 2023).

At the same time, the findings also caution against overstating children's climate understanding. Some climate-related statements resembled adult discourse, raising the possibility that children were at times reproducing fragments of culturally circulating narratives rather than constructing independently elaborated explanations. Somerville and Williams (2015), in their review of research on sustainability education in early childhood, similarly emphasize the value of embodied and place-based engagement that grounds children's understandings in local experience, highlighting the need for pedagogies that calibrate symbolic representations with tangible experiences. This is consistent with developmental research showing that abstract, global-scale processes are challenging during the preschool years, and that productive climate pedagogy for young children must carefully balance emotional safety with honest engagement (Chawla, 2020; Ojala, 2016). Recent work on eco-anxiety further underscores why this balance matters: even when children's scientific explanations are limited, climate-related worry can emerge through media and adult conversations, making pedagogies that cultivate meaning-focused coping and hopeful engagement especially important (Léger-Goodes et al., 2023; Pihkala, 2020).

Against this backdrop, drama can be interpreted not merely as an engaging method but as a *symbolic mediation* that enables preschool children to approach complex issues through narrative, role, and embodied choice. The program's dramatized dilemmas created structured opportunities for children to inhabit positions (e.g., conserving vs. wasting, protecting vs. polluting) and to articulate reasons for action in socially meaningful ways. In this sense, drama functioned as a classroom-based pathway into what might be described as "response-ability"—the capacity to feel-with and respond ethically within a more-than-human world (Haraway, 2016). This interpretation is consistent with McNaughton's (2010) work on drama as a vehicle for exploring environmental dilemmas and complements literature emphasizing the power of narrative and symbolic play in shaping pro-environmental orientations (Cutter-Mackenzie-Knowles & Rousell, 2019; Sawyer, 2012). It also resonates with work on "becoming-with" pedagogies in early childhood sustainability education, which shows how children's affective encounters with other species can generate response-abilities (Weldemariam, 2020).

The findings also draw attention to the move from the specific to the abstract that climate education in the early years inevitably involves. The drama scenarios were concrete and local (a running tap, a crowded street, a light left on), whereas climate change is a diffuse, global, and long-term process. In our data, most responsibility-oriented talk remained at the level of local environmental care, and only a subset of children connected everyday actions to climate-related processes; these connections appear to have been supported by the adult scaffolding built into the energy and livable world themes. We therefore read the step from "we turn off the tap" to "we should not make the world hotter" not as evidence that children had understood climate change, but as an early bridge between embodied, local experience and a wider scale of concern. Such a bridge seems to depend on adult mediation, which is consistent with Vygotsky's (1978) view that new forms of thinking first appear in joint activity before they become available to the child independently. It also carries a risk. If the only climate response children rehearse is individual resource saving, climate education may reproduce an individualized notion of responsibility that overlooks collective and structural action (Chawla & Cushing, 2007; Hayward, 2012). A more developed symbolic nature pedagogy might therefore include dramas in which children act together, as a class, a neighborhood, or a town council, to address a shared problem, so that response-ability is rehearsed as a collective as well

as an individual capacity.

This study therefore contributes to ongoing debates about whether meaningful environmental and climate learning in early childhood depends primarily on direct contact with nature. Consistent with prior work, direct outdoor experiences remain important for connectedness and responsibility (Richardson et al., 2021; Soga & Gaston, 2016). However, the present findings extend this conversation by showing that symbolic encounters—when designed as relational, dialogic, and choice-oriented—may also support related orientations, although the present design does not allow comparison with outdoor-based approaches, particularly in contexts where outdoor access is constrained by urbanization, infrastructure, safety policies, or seasonality. In this sense, the study offers a pragmatic reframing: rather than positioning classroom-based symbolic pedagogies as inferior substitutes for outdoor learning, they can be conceptualized as complementary pathways that prepare children for later inquiry and outdoor engagement by building language, perspective-taking, and moral concern. This is consonant with broader syntheses of climate change education that call for participatory, creative, and affect-driven approaches which give children both a "voice" and a "hand" in responding to climate issues (Rousell & Cutter-Mackenzie-Knowles, 2020).

A further implication concerns eco-anxiety and the risk of "crisis-heavy" climate messaging in early childhood settings. The study's findings respond to critiques that environmental education can overemphasize catastrophe, fostering fear, helplessness, or passivity (Ojala, 2016; Sobel, 2008). In the present program, dramatized dilemmas framed environmental problems through constructive problem-solving and relational responsibility rather than through apocalyptic narratives. Teacher and parent reports that children enacted simple conservation practices suggest that the intervention supported agency-oriented engagement in developmentally appropriate ways. While the study does not measure emotional outcomes directly, the pattern of responsibility talk—paired with practical, everyday actions—suggests a promising direction for early childhood climate pedagogy: cultivating hopeful, relational engagement that acknowledges environmental problems without overwhelming children's emotional capacities (Pihkala, 2020).

Policy and Practice Implications

At a policy level, the findings contribute to current debates in Türkiye regarding the integration of sustainability and environmental responsibility into the 2024 Preschool National Curriculum (Ministry of National Education [MoNE], 2024). The program demonstrates how such curricular intentions can be operationalized through drama pedagogy without requiring extensive infrastructural change. In Türkiye, where creative drama already has a recognized place in early childhood teacher education and classroom practice (Adıgüzel, 2006), such an approach may be feasible to integrate into existing routines. Internationally, the study aligns with SDG 4 (Quality Education) and SDG 13 (Climate Action), underscoring the role of early childhood education in fostering dispositions that support sustainability transitions (UNESCO, 2021). For practitioners working in urban preschools or contexts with limited outdoor access, the findings suggest that drama can provide meaningful opportunities to rehearse environmental responsibility through narrative dilemmas, role-play, and guided dialogue. Teachers may adapt the thematic map and logic model flexibly to their own settings, combining symbolic enactment with locally feasible experiential extensions. This aligns with international scholarship emphasizing that ECEfS initiatives are strengthened when locally embedded pedagogies are explicitly linked to broader sustainability agendas (Ärlemalm-Hagsér & Elliott, 2020).

Limitations and Future Directions

The study's contributions should be interpreted within its limitations. The single-site case study design and relatively small, homogeneous sample constrain transferability to other settings. The intervention was short-term and classroom-based, precluding claims about long-term behavioral change or enduring climate consciousness. Although teacher and parent reports indicated behavioral transfer, such evidence is best interpreted as short-term enactment rather than sustained transformation. In addition,

because one of the researchers implemented the program and teacher and parent accounts were collected after the intervention, both children's responses and adults' reports may have been shaped by social desirability. The study did not include a comparison group; changes in children's talk therefore cannot be attributed to the program alone, as maturation and other classroom or family experiences during the twelve weeks may also have contributed. Moreover, the program relied primarily on symbolic drama scenarios without complementary outdoor inquiry or hands-on investigations that might have grounded abstract climate concepts in tangible experiences. Future research would benefit from (a) hybrid designs integrating drama with outdoor exploration and inquiry-based activities, (b) larger and more diverse samples across socio-economic and cultural contexts, and (c) longitudinal follow-up to examine the durability of children's responsibility-oriented reasoning and everyday practices. Additionally, future studies could more directly examine the emotional dimensions of early climate learning (e.g., hope, worry, meaning-focused coping), given emerging evidence that climate-related emotions can be present even when children's conceptual models are still forming (Léger-Goodes et al., 2023; Pihkala, 2020).

Despite these limitations, the study offers an original contribution by illustrating how drama, as a symbolic and dialogic pedagogy, can support both environmental awareness and emerging climate consciousness in preschool children. By clarifying the awareness–consciousness distinction and showing how it becomes visible in children's talk and choices within dramatized dilemmas, the study adds a developmentally grounded lens to early childhood environmental education. It further positions drama as a viable, pragmatic approach for sustainability-oriented learning in contexts where access to outdoor experiences is constrained, thereby contributing to a growing body of scholarship advocating creative, play-based strategies for embedding sustainability and climate engagement in early childhood education.

Conclusion

This study examined how a drama-based environmental education program supported preschool children's environmental awareness and emerging climate consciousness in Türkiye. Over a twelve-week period, children's initially fragmented and utilitarian understandings of environmental elements such as soil, water, and air shifted toward more relational and integrated interpretations. Their awareness of environmental problems became more specific and causally articulated, and some children expressed responsibility-oriented reasoning that reflected the early emergence of climate consciousness. Teacher and parent reports corroborated these patterns, suggesting that children's learning was enacted within everyday routines both at school and at home.

The study contributes to the field by suggesting that drama can function as a pragmatic form of symbolic nature pedagogy, enabling young children to engage meaningfully with environmental and climate-related ideas even in classroom-bound contexts with limited access to outdoor environments. By analytically distinguishing between environmental awareness and climate consciousness, the study clarifies what short-term, developmentally appropriate interventions can plausibly achieve without overstating their impact. In doing so, it offers a nuanced lens for interpreting early childhood environmental learning that foregrounds relational reasoning, moral positioning, and responsibility-oriented talk rather than abstract conceptual mastery.

Although exploratory in scope, the study underscores the importance of embedding sustainability into preschool curricula through creative, play-rich, and developmentally responsive pedagogies. Future research should build on this work by integrating drama with outdoor inquiry, expanding to larger and more diverse populations, and employing longitudinal designs to examine the durability of children's environmental orientations over time. Through such efforts, early childhood education can play a meaningful role in advancing broader societal commitments to sustainability within global frameworks such as the United Nations Sustainable Development Goals.

Positioning drama as symbolic nature pedagogy not only addresses the immediate developmental realities of preschool classrooms but also offers a transferable and adaptable model for ECEfS. By making environmental responsibility discussable, enactable, and relationally meaningful in the early years, such

pedagogical approaches contribute to laying the foundations for more hopeful, engaged, and ethically attuned relationships with the natural world.

Declarations

Authors' Declarations

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Authors' contributions: EO conceptualized the study and served as the principal investigator. She led the development of the research design, conducted the literature review, oversaw data collection and recording, performed data analysis, and was primarily responsible for drafting and reporting the manuscript. RNST contributed to the preparation and implementation of the drama-based environmental education program and played an active role in the data collection process. Both authors reviewed and approved the final version of the manuscript.

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