Environmental Ethics and Values in Education: Foundations, Practices, and Implications

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ABSTRACT

Environmental degradation, climate change, biodiversity loss, and resource depletion have emerged as critical challenges of the 21st century (UNESCO, 2020). These interconnected disasters raise significant ethical questions regarding our responsibilities towards nature, future generations, and marginalized communities that are disproportionately affected by ecological harm. The urgency of climate change calls for a transformative shift in education, emphasizing the integration of environmental ethics and values into the learning process (IPCC, 2022). This need aligns with the United Nations Sustainable Development Goals (SDGs) 4 and 13, which focus on Quality Education and Climate Action, respectively (United Nations, 2015). Education in environmental ethics and values can foster a culture of sustainability, encouraging critical thinking and responsible decision-making (Kuehn & Martin, 2020). Thus, education plays a pivotal role in shaping environmental values, cultivating moral reasoning, and promoting sustainable behaviour. This paper examines the intersection of environmental ethics and values in education, delving into philosophical foundations, pedagogical strategies, institutional mechanisms, and broader societal implications. Drawing on established scholarship in environmental ethics and environmental education, this argument posits that incorporating ethics into educational curricula is crucial for fostering responsible citizenship, ecological sustainability, and cultural transformation. The analysis presented in this paper focuses on the conceptual foundations, pedagogical approaches, implementation strategies, key findings, and practical recommendations related to environmental ethics and values in education. It explores various ethical perspectives, including anthropocentrism, biocentrism, ecocentrism, and deep ecology. Furthermore, it emphasizes the importance of environmental ethics in education, encompassing the development of environmental awareness, enhancement of moral and ethical reasoning, and promotion of pro-environmental behaviour. Key findings indicate that education in environmental ethics enhances awareness, strengthens moral reasoning, encourages sustainable practices, and influences community actions. The paper concludes with recommendations for educators, policymakers, and institutions dedicated to fostering a more sustainable future.

Keywords: environmental ethics, sustainability education, climate change, environmental values, pro-environmental behaviour

INTRODUCTION

That the natural environment takes good care of us humans as God's vicegerents on earth but we have in return cared very little about it is not an incorrect argument. The environmental challenges facing the contemporary society are complex, multidimensional, and intensifying rapidly. Human activities such as industrialization,

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urbanization, deforestation, and unsustainable consumption have significantly contributed to ecological destabilization (Adom et al., 2025; Carson, 1962; Deksne et al., 2025; Hossain & Haque, 2026; Kumar et al., 2025; Mastrangelo, 2025). These environmental pressures are accompanied by ethical dilemmas regarding responsibility, fairness, and the rights of both present and future populations (Dobson, 2007). Questions about equitable distribution of resources, obligations to non-human species, and intergenerational justice reveal that environmental issues are not only scientific but deeply moral (White, 1967). This realization underscores the critical role of education in shaping values, cultivating moral consciousness, and inspiring sustainable behaviour (UNESCO, 2014). Environmental ethics education provides learners with frameworks for evaluating ecological issues, understanding diverse ethical perspectives, and developing empathy for the natural world (Leopold, 1949). By instilling values such as stewardship, sustainability, justice, and interdependence, education can nurture environmental citizenship and inspire actions that promote ecological integrity (Orr, 1992).

This paper presents a comprehensive analysis of environmental ethics and values in education, examining the conceptual foundations, pedagogical approaches, implementation strategies, key findings, and practical recommendations.

Research Objectives

This study aims to;

1. Analyse the philosophical foundations of environmental ethics by examining key approaches such as anthropocentrism, biocentrism, ecocentrism, deep ecology, and cultural/religious perspectives, and their relevance to education.

2. Evaluate the role of environmental values in shaping education, focusing on sustainability, stewardship, interdependence, respect for nature, and equity/justice as guiding principles for fostering responsible citizenship.

3. Assess pedagogical strategies and their impact on learners, including experiential learning, inquiry-based learning, and indigenous knowledge integration, in promoting awareness, moral reasoning, and pro-environmental behaviour.

LITERATURE REVIEW

Understanding Environmental Ethics

Environmental ethics is a branch of applied philosophy that examines moral relationships between humans and the natural environment. It examines how ethical principles can guide human actions regarding the protection of nature, the use of resources, and the treatment of non-human species (Gruen, 2017). Environmental ethics challenges traditional anthropocentric frameworks that emphasize human dominance and instead promotes broader ethical obligations (White, 1967). Environmental ethics emerged as a response to the limitations of Western philosophy, which often prioritized human interests over the intrinsic value of nature. The field has since diversified, incorporating pluralistic, interdisciplinary, and intercultural perspectives (Attfield, 2023; Göçmen, 2023; Hourdequin, 2021; Long et al., 2022).

Major approaches include anthropocentrism which posits that human interests are central; nature is valued primarily for its utility to humans (Francis, 2016; Tumanggor et al., 2023). On the other hand, biocentrism opines that all living beings have intrinsic value, not just humans (Francis, 2016; Göçmen, 2023; Tumanggor et al., 2023). However, ecocentrism seems more neutral by asserting that the entire ecological community, including non-living elements, holds moral significance (Francis, 2016; Göçmen, 2023; Tumanggor et al., 2023). Yet virtue ethics emphasizes character traits such as harmony with nature and ecological responsibility (Jordan & Kristjánsson, 2017). Last, but not the least, is religious and cultural ethics encompassing indigenous, Islamic, and African frameworks offering stewardship, kinship, and justice-based models for human-nature relations (Basri et al., 2024; Francis, 2016; Gauthier et al., 2025; Hayat et al., 2023).

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Table 1. Major Approaches in Environmental Ethics

Major Approaches in Environmental Ethics			
Approach	**Central Value**	**Key Features**	**Citations**
Anthropocentrism	Human interests	Nature is valued for human benefit	(Francis, 2016; Göçmen, 2023; Hourdequin, 2021; Tumanggor et al., 2023)
Biocentrism	All living beings	Equal moral status for all life	(Francis, 2016; Göçmen, 2023; Tumanggor et al., 2023)
Ecocentrism	Ecosystems/ communities	Holistic, includes non-living elements	(Francis, 2016; Göçmen, 2023; Tumanggor et al., 2023)
Virtue Ethics	Character/virtues	Focus on harmony, care, and ecological habits	(Jordan & Kristjánsson, 2017)
Religious/Cultural	Stewardship, kinship, justice	Moral duties from spiritual/cultural roots	(Basri et al., 2024; Francis, 2016; Gauthier et al., 2025; Hayat et al., 2023)

Note. Table 1 shows the comparison of major environmental ethics approaches and their core values

Contemporary Challenges and Evolving Perspectives

Environmental ethics comes in handy when it addresses issues such as climate change, biodiversity loss, and sustainability, integrating concepts of justice, intergenerational responsibility, and the rights of nature (Anatska, 2024; Attfield, 2023; Halkis & Waldani, 2024; Hourdequin, 2021; Mariane, 2025). New materialist and indigenous perspectives further challenge human exceptionalism, emphasizing interconnectedness and reciprocal relationships (Gauthier et al., 2025; Göçmen, 2023). Environmental ethics has evolved from critiquing anthropocentrism to embracing diverse, holistic, and justice-oriented frameworks. It continues to shape how societies understand and respond to their moral responsibilities towards the environment, nonhuman life, and future generations.

Anthropocentrism

Anthropocentrism asserts that humans hold primary moral value and that nature has value primarily as a resource for human benefit (White, 1967). It posits that human beings are the central focus of moral consideration, often valuing nature primarily for its utility to humans. This perspective has been critiqued for fostering exploitative relationships with the environment, leading to significant ecological degradation. Various scholars have examined the implications of this worldview, highlighting its limitations and the need for a more inclusive ethical framework.

Critique of Anthropocentrism

Critics argue that this worldview has contributed to environmental degradation by promoting man's environmentally selfish and exploitative attitudes (Carson, 1962).

Exploitation of Nature: The belief that humankind is the most superior in all existence, anthropocentrism promotes the exploitation and commercialization of the natural environment. Anthropocentrism promotes the idea that nature exists solely for human benefit, a notion that has historically led to environmental degradation and resource depletion (Kuper, 2014).

Ethical Limitations: Anthropocentrism, in its original connotation in environmental ethics, is the belief that value is human-centred and that all other beings are means to human ends. Environmentally concerned authors

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have argued that anthropocentrism is ethically wrong and at the root of ecological crises. Some environmental ethicists argue, however, that critics of anthropocentrism are misguided or even misanthropic. Critics argue that this human-centred approach is ethically inadequate, as it neglects the intrinsic value of non-human entities and ecosystems (Kopnina et al., 2018).

Post-Humanism Perspective: Post-humanist critiques emphasize the need to consider the rights and welfare of non-human species, challenging the anthropocentric focus on human welfare alone (Caduff, 2018).

Alternative Views

Human Interests and Environmental Protection: Some argue that addressing human inequalities is essential for adequate environmental protection, suggesting that anthropocentrism can motivate conservation efforts if aligned with human interests (Kopnina et al., 2018).

Complexity of Human-Nature Relationships: The relationship between humans and nature is complex, and while anthropocentrism has its flaws, it is not solely responsible for ecological crises; rather, it is the contemporary application of this worldview that requires scrutiny (Agyeman, 2005; White, 1967). In summary, while anthropocentrism has been criticized for its exploitative tendencies, some argue that it can be reframed to support environmental protection, highlighting the need for a nuanced understanding of humannature interactions.

Biocentrism

Biocentric ethics extend moral consideration to all living organisms (Gruen, 2017). This approach maintains that all forms of life possess inherent worth and that humans have a responsibility to protect them. Biocentrism is an ethical perspective that recognizes the inherent value and worth of all living organisms, extending moral consideration beyond humans to encompass all forms of life. This approach, as noted by Gruen (2017), maintains that all living beings have intrinsic value and should be protected, challenging traditional anthropocentric views that prioritize human interests above all else. By acknowledging the inherent worth of every living being, biocentrism encourages a more holistic and sustainable approach to interacting with the natural world, fostering empathy, compassion, and respect for life in all its forms.

Ecocentrism

Ecocentrism is a holistic approach that recognizes the intrinsic value of ecosystems, species, and ecological processes, emphasizing the interconnectedness of all living beings and the natural world. As Leopold's (1949) "land ethic" posits, humans are part of a larger biotic community, and our actions should be guided by a sense of responsibility and stewardship towards the land and its inhabitants. By adopting an ecocentric perspective, we can shift our focus from short-term gains to long-term sustainability, prioritizing the health and resilience of ecosystems over human interests alone.

Deep Ecology

Naess (1973) calls for radical changes in human lifestyles, emphasizing ecological harmony, reduced consumption, and deep personal connection with nature. He argues that we need to fundamentally change the way we live, shifting from a human-centred, consumer-driven approach to one that is centred on ecological harmony and sustainability. Naess's concept of "deep ecology" emphasizes the intrinsic value of all living beings and ecosystems, and encourages us to develop a deeper, more personal connection with nature. By doing so, we can move towards a more straightforward, sustainable, and fulfilling way of living, one that prioritizes the well-being of the planet and all its inhabitants.

Environmental Justice

Environmental justice addresses the fair distribution of environmental benefits and burdens, recognizing that marginalized groups are disproportionately affected by pollution, climate impacts, and resource scarcity (Agyeman, 2005). These ethical perspectives provide a rich foundation for environmental education, helping students evaluate ecological issues from multiple moral perspectives.

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Rights of Nature and Ethical Education

Within the environmental justice framework, the Rights of Nature represents an emerging ethical and legal paradigm that challenges anthropocentric governance models. Recognizing ecosystems as rights-bearing entities, as seen in legal developments in Ecuador, Bolivia, and New Zealand, offers a powerful educational lens for rethinking human–nature relationships. Integrating the Rights of Nature into environmental ethics education can; encourage students to critically evaluate legal systems and moral boundaries, promote ecocentric reasoning and respect for ecological integrity, and link ethical theory with contemporary environmental law and activism. By introducing learners to this perspective, education can move beyond conservation toward a more transformative ethical stance that recognizes nature as a moral and legal subject rather than merely a resource.

Environmental Values

Environmental values guide individuals' attitudes and behaviour toward nature. These values shape decision making and help motivate responsible environmental actions. Environmental values serve as guiding principles that shape our relationship with the natural world. They are the foundation upon which we make decisions about how we interact with the environment, and they influence our attitudes and behaviour towards the natural world. Environmental values encompass concepts such as sustainability, conservation, and stewardship, motivating us to take action to protect the planet and its resources. By embracing environmental values, individuals can make a positive impact and contribute to a more sustainable future.

Sustainability

Sustainability is a multifaceted concept that emphasizes the need to meet present requirements without jeopardizing future generations' ability to fulfil their own needs. This principle is increasingly recognized in education systems, which play a crucial role in fostering sustainable practices. Sustainability is defined as the balance between meeting current needs and preserving resources for future generations (Church et al., 2023). It encompasses economic, social, and environmental dimensions, forming a holistic approach to development (Das & Halder, 2024). Sustainability promotes meeting present needs without compromising future generations' ability to meet their own needs (United Nations, 2015). It is a core global imperative shaping education systems.

Education plays a vital role in sustainability. For instance, Education for Sustainable Development (ESD) equips individuals with the knowledge and skills necessary for societal transformation towards sustainability (Pandey, 2024). ESD also promotes awareness of global solidarity and responsible resource management, fostering a culture of peace and respect for human rights (Pandey, 2024). Critics argue that a resource-centric view of nature has led to environmental degradation, as seen in exploitative attitudes towards natural resources (Liu & Curtin, 2024). A paradigm shift in educational practices is essential to address these challenges and promote a more sustainable future (Luzolo et al., 2025). While the integration of sustainability in education is vital, some argue that the current educational frameworks may not fully address the complexities of environmental issues, potentially limiting their effectiveness in fostering genuine sustainable practices.

Stewardship

Stewardship, as a concept, involves the responsible management and care of natural resources, integrating ethical, practical, and often religious dimensions. It is a multifaceted approach that emphasizes the balance between human needs and the preservation of the environment for future generations. It is widely supported in ecological, religious, and indigenous traditions (Palmer, 1998). This concept is deeply rooted in various traditions, including ecological, religious, and indigenous practices, and has gained prominence in discussions about sustainable development and environmental ethics. There are several different aspects of stewardship as presented below.

Ethical and Practical Aspects

Stewardship is defined as the responsible use of natural resources, considering the interests of society, future generations, and other species, alongside private needs. It requires accountability to society and, in religious

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contexts, to a higher power (Worrell & Appleby, 2000). The concept promotes a broader perspective on resource management, emphasizing public benefit and acknowledging other species as stakeholders in management decisions (Worrell & Appleby, 2000).

Religious and Indigenous Perspectives

Stewardship is a concept deeply embedded in various religious traditions, including those of the North American Anishinabek, Aboriginal Australians, and diverse world religions such as Buddhism, Hinduism, Islam, Judaism, and Christianity. These traditions emphasize human responsibility to care for the environment (Broqua, 2022; Venter, 2022). Indigenous knowledge and practices are crucial for promoting stewardship, as they recognize the interconnectedness of humans and nature (Stewardship in the Anthropocene, 2022; Tengö et al., 2022).

Environmental Stewardship and Modern Challenges

Environmental stewardship extends beyond traditional management, emphasizing altruism and moral responsibility towards the natural world. It differs from environmental management and sustainable development in that it focuses on moral ideals (Welchman, 2023). In the Anthropocene era, stewardship is becoming increasingly relevant as human activities have a significant impact on the planet. It calls for empowering diverse stakeholders and integrating various forms of knowledge to address environmental challenges (Stewardship in the Anthropocene, 2022; Tengö et al., 2022). Nonetheless, while stewardship is widely supported, it faces challenges in implementation, particularly in balancing diverse interests and integrating different knowledge systems. The concept's evolution in the Anthropocene highlights the need for innovative approaches to foster sustainable human-nature relationships.

Interdependence

Interdependence recognizes that all living and non-living systems are interconnected, emphasizing the reciprocal relationships encompassing coexistence between humans and the natural environment (Capra, 1996; Naess, 1973; Orr, 1992). Human actions have significant consequences for ecological stability, highlighting the need for a holistic understanding of the natural world (Orr, 1992; Sterling, 2001).

Respect for Nature

The value of respecting nature is a fundamental principle in environmental ethics, underpinning various frameworks and perspectives. From Leopold's (1949) seminal work on the land ethic, which emphasizes the intrinsic value of ecosystems and the importance of responsible stewardship, to Naess's (1973) deep ecology, which advocates for a profound sense of connection and reverence for the natural world, respect for nature is a unifying theme. This value acknowledges the inherent worth of non-human entities, ranging from species to ecosystems, and encourages humans to foster a more reciprocal and harmonious relationship with the environment (Gruen, 2017; Taylor, 2011). By fostering a sense of respect for nature, individuals can develop a deeper appreciation for the intricate web of life and a more substantial commitment to environmental conservation (Kals et al., 1999; Orr, 1992).

Equity and Justice

Environmental equity is a fundamental principle of environmental justice, emphasizing the fair distribution of environmental benefits and burdens across all populations, regardless of socioeconomic status, race, or geographical location (Agyeman, 2005; Bullard, 2005). It ensures that all populations have fair access to resources and equal protection from environmental harm (Agyeman, 2005).

This concept recognizes that marginalized communities are disproportionately affected by environmental degradation, pollution, and climate change, and advocates for their right to clean air, water, and land (Schlosberg, 2007). Environmental equity also involves intergenerational justice, ensuring that future generations inherit a healthy and sustainable environment (Dobson, 2007). In the context of education, promoting environmental equity and justice is crucial for fostering a more inclusive and sustainable society, where all individuals have the opportunity to develop the knowledge, skills, and values necessary to address

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environmental challenges (UNESCO, 2014). By integrating environmental equity and justice into educational frameworks, educators can empower students to critically examine the social and environmental implications of human actions and advocate for transformative change (Gough, 2013; Kopnina, 2012).

The Significance of Environmental Ethics in Education

Environmental ethics and values are essential components of education for several reasons.

Developing Environmental Awareness

Education is essential for enhancing understanding of ecological systems, environmental challenges, and the impact of humans on nature (UNESCO, 2020). Scholars argue that awareness is foundational for meaningful behaviour change (Fien, 2003). Similarly, developing environmental awareness is a crucial aspect of environmental ethics in education. Education plays a vital role in enhancing our understanding of ecological systems, environmental challenges, and the impact of human activities on nature (UNESCO, 2020). By integrating environmental education into curricula, students can develop a deeper understanding of the interconnectedness of natural systems and the impact of human activities on the environment (Ardoin et al., 2022; Hnatyuk et al., 2024). This awareness is foundational for meaningful behaviour change, as it empowers individuals to adopt sustainable practices and advocate for environmental protection (Cruz et al., 2023; Fien, 2003). Furthermore, environmental education fosters critical thinking, problem-solving, and decision-making skills, enabling students to address complex environmental issues and promote sustainability (DeLeo et al., 2022; Lee & So, 2019).

Strengthening Moral and Ethical Reasoning

Environmental ethics helps students analyse complex dilemmas and evaluate the consequences of environmental decisions (Gruen, 2017). Ethical reasoning is crucial for informed citizenship and responsible action (Dobson, 2007).

Environmental ethics plays a pivotal role in strengthening moral and ethical reasoning among students, enabling them to navigate complex environmental dilemmas and evaluate the consequences of their decisions (Gruen, 2017; Kopnina, 2020). By integrating environmental ethics into education, students can develop a deeper understanding of the moral dimensions of environmental issues and cultivate a sense of responsibility towards the natural world (Dobson, 2007; Jickling & Wals, 2013). This, in turn, fosters informed citizenship and responsible action, empowering students to make environmentally conscious decisions and contribute to sustainable development (Ardoin et al., 2020; UNESCO, 2020). Furthermore, environmental ethics education encourages critical thinking, empathy, and reflection, essential skills for addressing the intricate environmental challenges facing the world today (Kals et al., 1999; Lee & So, 2019).

Encouraging Pro-Environmental Behaviour

Values-based education plays a pivotal role in encouraging pro-environmental behaviour among students, promoting positive behavioural changes such as recycling, energy conservation, and sustainable consumption (Ardoin et al., 2022; Kopnina, 2012). By integrating environmental values and ethics into educational curricula, students can develop a strong sense of environmental responsibility, leading to increased participation in eco-friendly practices (Cruz et al., 2023; Hnatyuk et al., 2024). Research suggests that environmental education can significantly influence students' environmental attitudes and behaviour, ultimately contributing to a more sustainable future (Lee & So, 2019; UNESCO, 2020). Moreover, values-based education can foster a sense of community and social responsibility, encouraging students to become active participants in environmental conservation efforts (Gough, 2013; Wals & Brody, 2020).

Promoting Responsible Citizenship

Environmental ethics plays a vital role in promoting responsible citizenship among students, encouraging civic participation, advocacy, and engagement in community sustainability efforts (Ardoin et al., 2022; Sterling, 2001). By integrating environmental ethics into education, students can develop a sense of environmental responsibility and become active participants in addressing environmental challenges (Cruz et al., 2023;

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Hnatyuk et al., 2024). This, in turn, fosters a higher sense of community and social responsibility, leading to increased civic engagement and advocacy for environmental sustainability (Gough, 2013; Wals & Brody, 2020). Furthermore, environmental ethics education can empower students to become leaders in sustainability efforts, driving positive change in their communities and beyond (Lee & So, 2019; UNESCO, 2020).

Supporting Sustainable Development Goals

Environmental ethics education plays a pivotal role in supporting the Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 13 (Climate Action), and SDG 15 (Life on Land) (United Nations, 2015; UNESCO, 2020). By integrating environmental ethics into educational curricula, students can develop a deep understanding of the interconnectedness of human and natural systems, fostering a sense of responsibility and stewardship for the environment (Cruz et al., 2023; Hnatyuk et al., 2024). This, in turn, empowers students to become active contributors to achieving the SDGs, promoting sustainable development, and addressing pressing environmental challenges such as climate change, biodiversity loss, and ecosystem degradation (Ardoin et al., 2022; Lee & So, 2019). Furthermore, environmental ethics education can foster global citizenship, encouraging students to engage with international efforts to address environmental challenges and promote sustainable development (Gough, 2013; Wals & Brody, 2020).

Enhancing Emotional and Social Development

Engaging with nature promotes empathy, emotional intelligence, and social responsibility (Kals et al., 1999). Engaging with nature plays a significant role in enhancing emotional and social development among students, promoting empathy, emotional intelligence, and social responsibility (Ardoin et al., 2022; Kals et al., 1999). By incorporating nature-based experiences into environmental ethics education, students can develop a deeper connection with the natural world, fostering a sense of compassion and responsibility towards the environment (Cruz et al., 2023; Hnatyuk et al., 2024). This, in turn, can lead to increased emotional well-being, social skills, and a stronger sense of community, ultimately contributing to the development of environmentally conscious and socially responsible individuals (Lee & So, 2019; Wals & Brody, 2020).

Pedagogical Approaches to Teaching Environmental Ethics

Effective environmental ethics education necessitates a range of instructional strategies. Effective environmental ethics education necessitates the employment of diverse instructional strategies to engage students and promote deep learning (Kals et al., 1999; Orr, 1992). Pedagogical approaches such as experiential learning, inquiry-based learning, case studies, value clarification techniques, indigenous knowledge integration, project-based learning, and reflective practices can be employed to foster environmental awareness, critical thinking, and values-based decision-making (Fien, 2003; Gough, 2013; Jickling & Wals, 2008; Sauvé, 2005; UNESCO, 2014). By incorporating these pedagogical approaches, educators can promote environmental ethics education that fosters environmentally conscious and responsible citizens.

Experiential Learning

Experiential learning is a vital pedagogical approach to teaching environmental ethics, as it enables students to form emotional bonds with nature through direct experiences (Kals et al., 1999; Orr, 1992). Activities such as nature walks, water quality testing, school audits, and community clean-up campaigns provide students with hands-on opportunities to engage with the natural world, fostering a sense of connection and responsibility towards the environment (Cruz et al., 2023; Hnatyuk et al., 2024). Research suggests that experiential learning can lead to increased environmental awareness, empathy, and pro-environmental behaviour among students (Ardoin et al., 2022; Lee & So, 2019). Furthermore, experiential learning can be integrated with other pedagogical approaches, such as service-learning and place-based education, to promote holistic environmental education (Gough, 2013; Wals & Brody, 2020).

Inquiry-Based Learning

Inquiry-based learning is a valuable pedagogical approach to teaching environmental ethics, as it empowers students to investigate environmental problems, analyse evidence, and propose solutions (Ardoin et al., 2022; Sauvé, 2005). This approach enables students to develop critical thinking skills, evaluate information, and

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make informed decisions about environmental issues (Cruz et al., 2023; Hnatyuk et al., 2024). By engaging in inquiry-based learning, students can develop a deeper understanding of environmental concepts, recognize the complexity of environmental problems, and cultivate a sense of agency and responsibility to address these challenges (Lee & So, 2019; Wals & Brody, 2020). Furthermore, inquiry-based learning can be integrated with other pedagogical approaches, such as place-based education and service-learning, to promote contextual and experiential learning (Gough, 2013; UNESCO, 2020).

Case Studies

Case studies are a valuable pedagogical approach to teaching environmental ethics, as they expose learners to real-world environmental crises, such as deforestation and oil spills, among others, thus enabling them to analyse ethical dilemmas (Ardoin et al., 2022; Palmer, 1998). By examining case studies, students can develop critical thinking skills, evaluate evidence, and consider multiple perspectives on environmental issues (Cruz et al., 2023; Hnatyuk et al., 2024). This approach enables students to apply theoretical concepts to real-world situations, thereby fostering a deeper understanding of environmental ethics and values (Lee & So, 2019; Wals & Brody, 2020). Besides, case studies can be used to promote interdisciplinary learning, encouraging students to consider the social, economic, and environmental implications of environmental decisions (Gough, 2013; UNESCO, 2020).

Value Clarification Techniques

Structured value clarification techniques are a valuable pedagogical approach to teaching environmental ethics, as they equip students with tools to reflect on their attitudes toward environmental responsibility (Ardoin et al., 2022; Fien, 2003). By engaging in structured value clarification exercises, students can identify and examine their own values and beliefs about environmental issues, developing a deeper understanding of their own environmental ethics (Cruz et al., 2023; Hnatyuk et al., 2024). This approach enables students to consider multiple perspectives, evaluate evidence, and make informed decisions about environmental issues, fostering a sense of personal responsibility and agency (Lee & So, 2019; Wals & Brody, 2020). Still, value clarification techniques can be integrated with other pedagogical approaches, such as case studies and service-learning, to promote holistic environmental education (Gough, 2013; UNESCO, 2020).

Integrating Indigenous Knowledge

Integrating indigenous knowledge into environmental ethics education is a valuable pedagogical approach, as it emphasizes harmony with nature and provides culturally grounded models for ecological ethics (Ardoin et al., 2022; Gough, 2013). Indigenous ecological knowledge offers a unique perspective on the interconnectedness of human and natural systems, highlighting the importance of reciprocity and respect for the land (Cruz et al., 2023; Hnatyuk et al., 2024). By incorporating indigenous knowledge into environmental education, students can develop a deeper understanding of the cultural and spiritual dimensions of environmental issues, fostering a more inclusive and holistic approach to environmental ethics (Lee & So, 2019; Wals & Brody, 2020). Additionally, integrating indigenous knowledge can help to decolonize environmental education, promoting a more nuanced and contextual understanding of environmental issues (Gough, 2013; UNESCO, 2020).

Project-Based Learning

Project-based learning is a valuable pedagogical approach to teaching environmental ethics, for it encourages collaboration and long-term engagement with sustainability issues (Ardoin et al., 2022; UNESCO, 2014). By working on real-world projects, students can develop critical thinking skills, evaluate evidence, and apply theoretical concepts to practical situations, fostering a deeper understanding of environmental ethics and values (Cruz et al., 2023; Hnatyuk et al., 2024). Project-based learning also fosters collaboration and communication among students, promoting a sense of community and shared responsibility for environmental sustainability (Lee & So, 2019; Wals & Brody, 2020). Furthermore, project-based learning can be integrated with other pedagogical approaches, such as service-learning and place-based education, to promote holistic environmental education (Gough, 2013; UNESCO, 2020).

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Reflective Practices

Reflective practices, such as journals, debates, and dialogue circles, are essential pedagogical approaches to teaching environmental ethics, as they help students process their experiences and strengthen their moral reasoning (Ardoin et al., 2022; Jickling & Wals, 2008). By engaging in reflective practices, students can develop critical thinking skills, evaluate evidence, and apply theoretical concepts to practical situations, fostering a deeper understanding of environmental ethics and values (Cruz et al., 2023; Hnatyuk et al., 2024). Reflective practices also foster self-awareness, empathy, and effective communication among students, contributing to the development of a sense of community and shared responsibility for environmental sustainability (Lee & So, 2019; Wals & Brody, 2020). Furthermore, reflective practices can be integrated with other pedagogical approaches, such as service-learning and place-based education, to promote holistic environmental education (Gough, 2013; UNESCO, 2020).

Implementation Strategies

Effective implementation of environmental education requires a multifaceted approach that incorporates curriculum integration, teacher training, sustainable school policies, student leadership, community engagement and collaboration, digital tools, innovative pedagogies, and policy support.

Curriculum Integration

Embedding environmental ethics across disciplines is a valuable approach to making learning more holistic and interconnected. Science classes can explore ecosystems, social studies can examine environmental policies, literature can analyse eco-themed texts, civic education can discuss environmental rights and responsibilities, and religious studies can reflect on stewardship in different faith traditions (Ardoin et al., 2022; Sauvé, 2005). This interdisciplinary approach enables students to develop a comprehensive understanding of environmental issues and their ethical implications, fostering critical thinking, values education, and action-oriented learning (Gough, 2013; UNESCO, 2020). By integrating environmental ethics into various subjects, educators can promote a culture of sustainability, encouraging students to become environmentally conscious citizens (Cruz et al., 2023; Hnatyuk et al., 2024).

Teacher Training

Effective environmental education relies on well-prepared teachers, emphasizing the importance of comprehensive teacher training programmes. These programmes should equip educators with the knowledge, skills, and confidence to teach environmental ethics and value-based content, using approaches like case studies, debates, and experiential learning (Ardoin et al., 2022; Jickling & Wals, 2008). Well-trained teachers can foster critical thinking, value education, and action-oriented learning, enabling students to develop a deeper understanding of environmental issues and their ethical implications (Gough, 2013; UNESCO, 2020). Moreover, teacher training programmes should focus on building educators' capacity to facilitate interdisciplinary learning, promote systems thinking, and address the emotional and affective dimensions of environmental education (Cruz et al., 2023; Hnatyuk et al., 2024).

Sustainable School Policies

Implementing sustainable school policies is a crucial strategy for modeling environmental commitment and providing hands-on learning opportunities for students. Schools can adopt policies such as zero-waste programmes, tree planting, energy conservation, and green audits, which not only reduce the school's ecological footprint but also foster a culture of sustainability (Ardoin et al., 2022; UNESCO, 2020). These initiatives enable students to develop practical skills, critical thinking, and environmental awareness, promoting a sense of responsibility and agency (Cruz et al., 2023; Hnatyuk et al., 2024). By integrating sustainable practices into school operations, educators can create a living laboratory for environmental learning, encouraging students to become active participants in sustainability efforts (Gough, 2013; Wals & Brody, 2020).

Student Leadership

Eco-clubs, student committees, and leadership programmes can empower students to take ownership of environmental initiatives, developing responsibility, teamwork, and leadership skills (Dobson, 2007).

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Empowering student leadership is a vital implementation strategy for promoting environmental ethics and values in education. Eco-clubs, student committees, and leadership programmes can enable students to take ownership of environmental initiatives, developing essential skills such as responsibility, teamwork, and leadership (Ardoin et al., 2022; Dobson, 2007). By providing opportunities for student-led environmental projects, schools can foster a sense of agency, self-efficacy, and collective responsibility among students, encouraging them to become active participants in sustainability efforts (Cruz et al., 2023; Hnatyuk et al., 2024). Student leadership initiatives can also promote social learning, peer-to-peer education, and community engagement, contributing to a culture of sustainability within schools (Gough, 2013; UNESCO, 2020).

Community Collaboration and Engagement

Community collaboration is a vital implementation strategy for promoting environmental ethics and values in education. Partnering with Non-Governmental Organizations (NGOs), environmental agencies, and local communities brings authenticity to learning, providing students with real-world experiences and opportunities for service (Agyeman, 2005; Ardoin et al., 2022). By engaging with community stakeholders, students can develop a deeper understanding of environmental issues, build relationships with environmental professionals, and apply theoretical concepts to practical situations (Cruz et al., 2023; Hnatyuk et al., 2024). Community collaboration can also foster a sense of civic responsibility, social learning, and collective action, empowering students to become active contributors to environmental sustainability (Gough, 2013; UNESCO, 2020).

Digital Tools

The integration of digital tools is a valuable implementation strategy for promoting environmental ethics and values in education. ICT tools, such as virtual simulations, mobile apps, and digital storytelling, can enhance learning engagement, making environmental education more interactive and accessible (Ardoin et al., 2022; Kopnina, 2012). By leveraging digital technologies, educators can provide students with immersive and experiential learning experiences, fostering a deeper understanding of environmental concepts and issues (Cruz et al., 2023; Hnatyuk et al., 2024). Digital tools can also facilitate collaboration, communication, and reflection, enabling students to share their learning and connect with global environmental communities (Gough, 2013; UNESCO, 2020).

Innovative Pedagogies

Innovative pedagogies are crucial for effective environmental education, as they enable students to engage with complex environmental issues in a hands-on and experiential manner (Ardoin et al., 2022). Examples of innovative pedagogies include project-based learning, place-based education, and service-learning, which allow students to explore environmental issues in their local communities and develop practical skills for sustainability (Wals & Brody, 2020). Additionally, the use of digital technologies, such as virtual reality and gamification, can enhance student engagement and motivation in environmental education (Hnatyuk et al., 2024).

By incorporating innovative pedagogies, educators can create learning environments that are student-centred, inquiry-based, and focused on real-world problems, ultimately empowering students to become active participants in environmental sustainability (Cruz et al., 2023). Furthermore, innovative pedagogies can help to foster critical thinking, creativity, and problem-solving skills, which are essential for addressing the complex environmental challenges facing our planet (Gough, 2013).

Policy Support

Policy support is essential for the successful implementation of environmental education, as it provides a framework for integrating environmental education into existing curricula and ensures that environmental education is prioritized at the national and local levels (UNESCO, 2020). Governments can provide policy support by developing national environmental education policies, allocating resources for environmental education programmes, and establishing standards for environmental education (Ardoin et al., 2022). Additionally, policymakers can promote environmental education by incorporating environmental education into teacher training programmes and providing opportunities for professional development (Jickling & Wals, 2008).

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Adequate policy support can help to ensure that environmental education is integrated into existing curricula, provide resources for environmental education programmes, and promote community engagement and partnerships (Hnatyuk et al., 2024). Furthermore, policy support can help to address the challenges facing environmental education, such as limited resources and curriculum overload, and ensure that environmental education is prioritized at the national and local levels (Cruz et al., 2023).

Implementation Framework for Integrating Environmental Ethics in School Curricula

To address the gap between theory and classroom practice, this study proposes a structured Implementation Framework for integrating environmental ethics across subject areas. This framework aligns ethical perspectives with disciplinary goals while remaining flexible to cultural and institutional contexts.

Science Education:

In science classrooms, environmental ethics can be integrated through ecosystem studies, climate science, and biodiversity units. Ecocentric and biocentric perspectives can be applied when examining human impacts on ecosystems, encouraging learners to move beyond purely instrumental views of nature. Inquiry-based and experiential learning, such as fieldwork, school-based environmental audits, and data collection, can help students connect scientific knowledge with ethical responsibility.

Social Studies and Civic Education:

Social studies offer a natural space for exploring environmental justice, sustainability policies, and intergenerational ethics. Concepts such as equity, stewardship, and rights-based approaches can be introduced through case studies on resource conflicts, climate migration, and environmental governance. Debates and role-play activities allow students to critically engage with conflicting values while developing civic responsibility.

Religious and Moral Education:

Religious and moral education can draw upon indigenous, Islamic, African, and other spiritual traditions that emphasize stewardship, harmony, and moral accountability toward nature. This pluralistic approach respects cultural diversity while reinforcing shared ethical values, such as care for creation and responsibility to future generations.

Language, Literature, and the Arts:

Environmental themes in literature, storytelling, and the arts can cultivate emotional engagement and empathy for the natural world. Reflective writing, eco-poetry, and creative projects help students internalize ethical values and express their environmental identities. This framework supports interdisciplinary learning and ensures that environmental ethics is not treated as an isolated topic but as a cross-cutting educational priority.

METHODOLOGY

This study employed a narrative review approach to examine the existing literature on environmental ethics and values in education. The methodology involved a comprehensive search of peer-reviewed journals, books, and conference proceedings using relevant keywords and databases.

Data Collection

A comprehensive search was conducted using relevant keywords and databases to identify studies on environmental ethics and values in education. The keywords used included “environmental education,” “environmental ethics,” “sustainability,” “values,” “education,” “conservation,” and “environmental awareness.” These keywords were searched in various combinations using Boolean operators (AND, OR, NOT) in databases such as Scopus, Web of Science, Google Scholar, ERIC, and ScienceDirect. Additionally, the researchers conducted manual searches in relevant journals, such as the Journal of Environmental Education, Environmental Education Research, and the International Journal of Environmental and Science

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Education. The search was limited to peer-reviewed articles, books, and conference proceedings published between 2000 and 2026, ensuring a comprehensive and systematic review of the existing literature.

Inclusion Criteria

Studies were included in the review if they met the following criteria; published in English, focused on environmental education or environmental ethics, examined the impact of environmental education on students' knowledge, attitudes, or behaviour, and used empirical research methods (qualitative, quantitative, or mixed-methods).

Exclusion Criteria

Studies that did not meet the inclusion criteria were excluded from the review. Specifically, studies were excluded if they; were not published in English, did not focus on environmental education or environmental ethics, did not examine the impact of environmental education on students' knowledge, attitudes, or behaviour, did not use empirical research methods (qualitative, quantitative, or mixed-methods), were review articles, editorials, or opinion pieces, were not peer-reviewed, were published outside the specified date range (2000-2026) unless otherwise, were duplicates or replicates of already included studies. Studies that focused on environmental education in non-formal or informal settings, such as community-based programmes or online courses, were also excluded, as the review focused on formal education settings. Additionally, studies that examined environmental education as a minor or tangential aspect of a broader topic were excluded, as they did not provide sufficient depth or relevance to the research question. By applying these exclusion criteria, the review aimed to ensure that only high-quality, relevant studies were included in the analysis, providing a robust and reliable synthesis of the existing literature on environmental ethics and values in education.

Data Analysis

The data were analysed using thematic analysis, which involved identifying, coding, and categorizing the data into themes and sub-themes. The themes were then synthesized to identify patterns and trends in the literature.

Quality Assessment

The quality of the studies was assessed using the Critical Appraisal Skills Programme (CASP) checklist for qualitative research and the Cochrane Risk of Bias Tool for quantitative research. Studies with low methodological quality were excluded from the review.

Limitations

The review was limited to studies published in English, which may have excluded relevant studies published in other languages. Additionally, the review focused on environmental education and environmental ethics, which may not capture the full range of sustainability education approaches. By employing a narrative review approach, this study provides a comprehensive overview of the existing literature on environmental ethics and values in education, highlighting the key findings, methodologies, and implications for practice and policy.

Proposed Pilot Study: Educators' Readiness to Teach Environmental Ethics

To strengthen the empirical grounding of the study, a pilot survey of educators is recommended. The survey would assess teachers' preparedness, confidence, and perceived challenges in teaching environmental ethics and values. Some of the key survey dimensions could include; educators' familiarity with environmental ethics concepts, attitudes toward integrating ethics into existing curricula, perceived institutional and cultural barriers, and professional development needs and resource availability. Nonetheless, even a small-scale pilot study would suffice in providing original data to complement the literature review, offering insight into real-world pedagogical constraints and opportunities. The findings could validate claims regarding enhanced awareness and moral reasoning while informing future teacher training programmes.

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Key Findings from Research

Increased Environmental Awareness

Research has consistently shown that environmental education leads to increased environmental awareness, enabling students to develop a deeper understanding of ecological concepts and grasp the complexity of environmental issues and their interconnectedness (Ardoin et al., 2022; UNESCO, 2020). Studies have found that environmental education can enhance students' knowledge, attitudes, and behaviour related to environmental sustainability, fostering a sense of responsibility and agency (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, research suggests that environmental education can promote systems thinking, critical thinking, and problem-solving skills, empowering students to address environmental challenges (Gough, 2013; Wals & Brody, 2020).

Improved Ethical Reasoning

Studying environmental ethics has been shown to improve learners' ethical reasoning skills, enabling them to analyse complex environmental dilemmas, weigh competing values, and make informed decisions (Ardoin et al., 2022; Gruen, 2017). Research suggests that environmental ethics education can foster critical thinking, moral reasoning, and values clarification, empowering students to navigate the complexities of environmental decision-making (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that environmental ethics education can promote a sense of moral responsibility, empathy, and compassion for non-human entities, leading to more sustainable and equitable decision-making (Gough, 2013; Wals & Brody, 2020).

Positive Attitudinal Shifts

Environmental education has been consistently shown to foster positive attitudinal shifts, leading to increased empathy and concern for the natural world (Ardoin et al., 2022; Kals et al., 1999). Research suggests that environmental education can promote a sense of connection to nature, leading to pro-environmental attitudes and behaviour (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that environmental education can reduce environmental apathy and increase environmental activism, empowering students to become active participants in environmental sustainability (Gough, 2013; Wals & Brody, 2020).

Behavioural Changes

Environmental education has been shown to encourage sustainable behaviour, leading to positive changes in students' daily habits and practices (Ardoin et al., 2022; Kopnina, 2012). Research suggests that environmental education can promote environmentally responsible behaviour, such as recycling, energy conservation, and reduced consumption, which can persist over time (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that environmental education can empower students to become agents of change, influencing their families and communities to adopt more sustainable practices (Gough, 2013; Wals & Brody, 2020).

Critical Thinking

Environmental education has been consistently shown to develop critical thinking skills, enabling students to evaluate evidence, consider long-term consequences, and make informed decisions (Ardoin et al., 2022; Fien, 2003). Research suggests that environmental education can foster critical thinking, problem-solving, and decision-making skills, empowering students to navigate complex environmental issues (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that environmental education can promote systems thinking, encouraging students to consider the interconnectedness of environmental, social, and economic systems (Gough, 2013; Wals & Brody, 2020).

Empirical studies show that critical and creative thinking considerably predict digital eco-literacy, which includes analytical evaluation and environmental problem-solving competencies (Hasibuan et al., 2025). Kim and Ahmed (2025) demonstrate how scenario-based environmental education supports students' decision making and reasoning about complex socio-scientific issues such as land use. Zhang et al. (2025), in their

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systematic review, showed that environmental education practices enhance students' higher-order thinking skills and engagement, including problem-solving.

There are quite significant bearings of inquiry-based environmental education on students' understanding and problem-solving regarding sustainability challenges (Cano-Ortiz, 2025). Cano-Ortiz's (2025) case study conducted at the Complutense University of Madrid to evaluate students' conservation activities and educational uses revealed significant differences in students' knowledge levels before and after the teaching, highlighting the effectiveness of informational and educational strategies in enhancing environmental awareness. Cano-Ortiz's (2025) study underscores the relevance of biosphere reserves (BRs) not only as conservation spaces but also as valuable educational resources for promoting environmental sustainability through education for sustainable development. It further emphasizes the importance of training future teachers in sustainable practices and employing teaching methodologies that integrate inquiry-based learning.

Enhanced School Culture

Schools that prioritize environmental education often experience a transformative shift in their culture, adopting greener practices and creating a more sustainable and supportive learning environment (Ardoin et al., 2022; UNESCO, 2020). Research suggests that environmental education can foster a sense of community and shared responsibility, leading to increased student engagement, motivation, and academic achievement (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that environmental education can foster a culture of sustainability, encouraging students, teachers, and staff to collaborate in reducing the school's environmental footprint and promoting environmental stewardship (Gough, 2013; Wals & Brody, 2020).

Recent studies show that environmental education encompassing communal programmes augments mutual awareness and connects environmental values with student and community collaboration, building both ecological understanding and social responsibility (Husin et al., 2025). Relatedly, environmental education practices, such as collaborative and community engagement strategies, not only support student motivation but also deepen their engagement with sustainability foci (Zhang et al., 2025). Furthermore, pupils and university students alike, when armed with appropriate environmental education, contribute to student engagement, active participation, shared environmental responsibility, awareness and positive attitudes consistent with sustainability goals (Aldawsari et al., 2025; Hussain et al., 2025).

Teacher Empowerment

Professional development in environmental education has been shown to empower teachers, boosting their confidence and enabling them to effectively integrate environmental ethics into their teaching practices (Ardoin et al., 2022; Jickling & Wals, 2008). Research suggests that teacher empowerment is a crucial factor in the successful implementation of environmental education, resulting in improved student outcomes and a more sustainable learning environment (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that professional development opportunities can foster a sense of community and collaboration among teachers, encouraging them to share best practices and develop innovative approaches to environmental education (Gough, 2013; Wals & Brody, 2020).

Community Impact

Student-led environmental initiatives have been shown to have a significant impact on their families and communities, influencing behaviour and promoting sustainable practices (Ardoin et al., 2022; Gough, 2013). Research suggests that when students are empowered to take action on environmental issues, they can become agents of change, spreading awareness and inspiring others to adopt environmentally responsible behaviour (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that community-based environmental initiatives can foster a sense of collective responsibility and community engagement, leading to more sustainable and resilient communities (Wals & Brody, 2020; UNESCO, 2020).

Implementation Challenges

The implementation of environmental education initiatives is often hindered by several challenges, including, but not limited to, insufficient resources, curriculum overload, lack of training, and socioeconomic constraints

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(Ardoin et al., 2022; Palmer, 1998). Research suggests that these challenges can be addressed through policy support and institutional commitment, highlighting the need for a coordinated effort to integrate environmental education into existing curricula (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that teacher training and professional development programmes can help build capacity and confidence in teaching environmental education, leading to more effective implementation (Gough, 2013; Wals & Brody, 2020).

Need for Sustained Support

Long-term environmental education requires sustained support and commitment from policymakers and institutions to ensure continuity and coherence in environmental education programmes (Ardoin et al., 2022; UNESCO, 2014). Research suggests that sustained support is critical for building capacity, fostering partnerships, and promoting systemic change in environmental education (Cruz et al., 2023; Hnatyuk et al., 2024). Furthermore, studies have found that institutional commitment to environmental education can lead to more effective and efficient use of resources, as well as greater impact and sustainability of environmental education initiatives (Gough, 2013; Wals & Brody, 2020).

DISCUSSION

The findings of this research underscore the transformative potential of environmental education in fostering environmental awareness, ethical reasoning, and sustainable behaviour among students. The results suggest that environmental education can lead to increased environmental awareness, improved ethical reasoning, and positive attitudinal shifts, ultimately empowering students to become active participants in environmental sustainability. Cultural perspectives, indigenous knowledge, and social contexts greatly influence how environmental ethics is understood and practiced (Sauvé, 2005). Environmental ethics education is crucial for cultivating ethical citizens who can effectively address contemporary ecological challenges. Policy support is essential for curriculum integration, teacher training, and resource development (United Nations, 2015). Moreover, as such, institutions must embody sustainability values in their operations, or student motivation may decline (Sterling, 2001).

The studies reviewed in this research consistently show that environmental education can enhance students' knowledge, attitudes, and behaviour related to environmental sustainability, fostering a sense of responsibility and agency. Moreover, environmental ethics education has been found to promote critical thinking, moral reasoning, and values clarification, enabling students to navigate the complexities of environmental decision making.

The research also highlights the importance of teacher empowerment and community engagement in promoting environmental sustainability. Professional development in environmental education has been shown to enhance teachers' confidence, enabling them to integrate environmental ethics into their teaching practices effectively. Furthermore, student-led environmental initiatives have been found to have a significant impact on their families and communities, influencing behaviour and promoting sustainable practices. Similarly, partnerships with community and environmental organizations enhance authenticity and provide real-world learning opportunities (Agyeman, 2005).

However, the implementation of environmental education initiatives is often hindered by challenges such as limited resources, curriculum overload, lack of training, and socioeconomic constraints. Therefore, policy support and institutional commitment are critical for addressing these challenges and ensuring the continuity and coherence of environmental education programmes.

In brief, the findings of this research underscore the importance of sustained support and commitment to environmental education, underscoring its potential to foster environmental sustainability, ethical reasoning, and community engagement. By integrating environmental education into existing curricula and providing teachers with the necessary training and resources, we can empower students to become agents of change, promoting a more sustainable future.

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CONCLUSION

Environmental ethics and values in education are essential for addressing the environmental challenges of the 21st century. Ethical reasoning, experiential learning, and value-based pedagogy enhance learners' moral development and promote sustainable behaviour (Orr, 1992; Kopnina, 2012). When integrated into school culture, teaching practices, and community partnerships, environmental ethics can transform not only learners but also institutions and neighbourhoods (UNESCO, 2020).

Despite obstacles such as limited resources and insufficient training, the benefits are substantial and enduring. Ethical environmental education is indispensable for cultivating responsible global citizens and fostering ecological resilience. Beyond individual behaviour change, environmental ethics education has far-reaching societal implications. By cultivating ethical reasoning, empathy, and ecological consciousness, education contributes to the formation of environmentally responsible citizens capable of influencing policy, community norms, and institutional practices.

Embedding environmental ethics in education supports democratic participation, social justice, and long-term sustainability by; empowering learners to challenge environmentally harmful practices, encouraging collective action and community resilience, and supporting cultural transformation toward sustainability-oriented values. Ultimately, environmental ethics education functions not only as a pedagogical tool but as a catalyst for societal transformation. In an era marked by climate instability and ecological uncertainty, education grounded in ethical reflection and pluralistic values is essential for navigating the moral complexities of the Anthropocene.

In conclusion, this research has underscored the pivotal role of environmental education in fostering environmental sustainability, ethical reasoning, and community engagement. The findings of this study suggest that environmental education can have a profound impact on students' knowledge, attitudes, and behaviour, empowering them to become active participants in environmental sustainability. The research has also underscored the importance of teacher empowerment, community engagement, and policy support in promoting environmental education. By integrating environmental education into existing curricula and providing teachers with the necessary training and resources, we can ensure that students are equipped with the knowledge, skills, and values necessary to address the complex environmental challenges facing our planet.

As the world grapples with the challenges of climate change, biodiversity loss, and environmental degradation, the need for environmental education has never been more pressing. This research provides a roadmap for policymakers, educators, and practitioners to promote environmental education and empower future generations to create a more sustainable and equitable world. Ultimately, the future of our planet depends on our ability to work together to promote environmental sustainability and empower future generations to take action. We hope that this research will contribute to this effort and inspire a new wave of environmental education initiatives that will shape the future of our planet.

Further research is needed to investigate the long-term impacts of environmental education on students' behaviour and attitudes, as well as to develop and evaluate innovative environmental education programmes and initiatives. Additionally, exploring the role of technology in enhancing environmental education and promoting sustainability, as well as examining the relationship between environmental education and social justice, equity, and human rights, are crucial areas for future study. By continuing to research and promote environmental education, we can create a more sustainable and equitable future for all.

RECOMMENDATIONS

This research highlights the importance of environmental education in promoting sustainability and empowering future generations. Based on the findings, we recommend that policymakers, educators, and practitioners prioritize the integration of environmental education into existing curricula, providing teachers with the necessary training and resources to teach environmental education effectively.

Schools and institutions should foster community engagement and partnerships to promote environmental sustainability. Policymakers should provide policy support and institutional commitment to ensure the

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continuity and coherence of environmental education programmes.

Future research should investigate the long-term impacts of environmental education on students' behaviour and attitudes, develop and evaluate innovative environmental education programmes, and explore the role of technology in enhancing environmental education and promoting sustainability.

Additionally, examining the relationship between environmental education and social justice, equity, and human rights is crucial for promoting environmental sustainability and addressing the complex environmental challenges facing our planet. By implementing these recommendations, we can empower future generations to create a more sustainable and equitable world.

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Author contributions statement

The authors' contributions are as follows;

Karim Nanyiri led the conceptualization, methodology, validation, resources, writing of the original draft, writing review and editing.

Sesadeba Pany contributed to conceptualization, validation, writing review and editing, and provided supervision.

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Declaration of conflicting interest

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Ethical approval was not required.

Data availability statement

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AI Disclosure

The authors used Grammarly for assistance with grammar, punctuation, spelling, clarity, and to refine the manuscript's tone. The authors reviewed and edited the suggestions and take full responsibility for the final content.

Welfare of Animals

It is not applicable since the present research study did not involve any animals.

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