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Conceptualising a justice approach to environmental education in the Global South: six pedagogical dimensions

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ABSTRACT

This paper conceptualises a pedagogical approach to environmental education that embeds multiple forms of justice and incorporates six dimensions. This pedagogical approach was developed as a response to findings from a large, comparative study of diverse forms of justice in policies relevant to education, pedagogical practices, and 14-17 year-old learners' experiences in Nepal, Peru and Uganda. In researching the connections across environmental, epistemic, transitional and social justice, our study showed three key barriers to transformative environmental education. In response, we propose that teachers using this pedagogical approach may help young people to understand the complexity of justice and its relationship to sustainable development through systemic and interdisciplinary thinking, developing critical and reparative pedagogies of place, encouraging individual action alongside an appreciation for collective responsibility and by promoting critical thinking.

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Introduction

The climate crisis is everywhere, touching every part of our lives as human and non-human beings. At the COP 28 held in Dubai it was emphasised that 'Climate action means education transformation' and through global initiatives such as UNESCO's Education for Sustainable Development for 2030 framework and the Greening Education Partnership, countries are being encouraged to step up efforts to mainstream environment and climate change curricula to transform education and build a more 'just and sustainable world' (UNESCO 2021). In this paper, we consider how such an education could be achieved by proposing a justice approach to environmental education in secondary schools. Our approach is based on six pedagogical dimensions based on findings from our wider study: critical pedagogy of place, interdisciplinary learning in teaching about justice related issues, critical thinking, systemic thinking, individual agency and collective responsibility, and reparative pedagogy.

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The significance of our approach comes from the integration of environmental, epistemic and transitional justice issues into environmental education. Our proposal is based on the findings and analysis of a large mixed methods comparative study entitled 'JustEd: Education *as* and *for* environmental, epistemic and transitional justice to enable sustainable development' ('JustEd', hereafter). JustEd (2020-23) was a study of secondary education in Nepal, Peru and Uganda – which has been unique in its analysis of environmental education through a multiple justices framework (JustEd 2023). While these three countries have significant economic, political and environmental differences, they were selected for the study as they share important characteristics that make a comparative study of multiple forms of justice in their schooling contexts meaningful. They are all multilingual and multicultural countries, they have all experienced large-scale conflicts in the past 50 years and they are all prominently affected by global climate and ecological crises. All of these phenomena have had life-changing impacts on people and communities – including enormous inequalities, slowed human development and intergenerational trauma – and education has been identified as a vehicle through which these impacts can be mitigated.

The JustEd project undertook mixed methods data generation and analysis in secondary schools and with young people aged 14 to 17 years in Nepal, Perú and Uganda. Quantiative data generated in the study included survey results from 4142 learners. The qualitative research components included participatory and arts-based interviews and/or focus groups with 97 learners, interviews with 52 teachers, interviews with 22 head teachers and local education policy makers, lesson observations, and analyses of policy and curriculum documents. We aimed to generate the qualitative data in schools and among learners who were generally representative of the general population in the area, in terms of cultural and linguistic diversity, income and family background. We conducted the research in 12 secondary schools: four state schools in each of Peru and Nepal, in different regions, and two state schools and two private (non-elite) schools in northern Uganda.

It is important to note that we interpret 'environmental education' broadly and therefore looked across disciplines to identify where teaching and learning about the natural environmental and related justice issues occurs. We identified priority subjects and accordingly, we analysed textbooks and learning materials across agriculture, biology, geography, natural science, social studies, and citizenship.

Our analysis has suggested that pedagogical transformation is a necessary condition for enabling the kinds of outcomes and actions expected for education to support climate action (Ajaps 2023; Groulx et al. 2021; Pereira and McGarry 2023; Schnitzler 2019). Therefore, while we focus on environmental education in this paper, our understanding and application of justice goes beyond environmental justice to also include conceptualisations from epistemic, social and transitional justice (see JustEd 2023).

We recognise that there are multiple terms used globally that relate to environmental education, although they often differ in terms of the forms, settings, content and aims of educational programmes they are referring to. These include, 'education for sustainable development' (ESD), 'climate change education' and 'sustainable development education'. We use the term 'environmental education' in this paper to refer broadly to education about the climate and the environment across diverse curriculum areas in formal education, including geography, biology, social sciences, health and

population, agriculture, etc. In the JustEd study, we analysed policies, curricular resources, teaching and learners' experiences across mainstream subject matters as they related to environmental and climate change issues.

In the first part of the paper, we discuss the identified limitations to dominant curricular and pedagogical approaches to environmental education. We then explain our justice approach to considerations of environmental education, particularly within the context of secondary schooling in the Global South. The methodology section provides an overview of the wider study's research design and the specific methods for identifying the theoretical pedagogical dimensions discussed within this paper. We then present the three main barriers that we identified in the JustEd study for effective environmental education and propose six pedagogical dimensions to respond to these barriers. In our conclusions we consider the implications of the dimensions for policy and practice, and for future research.

Limitations to dominant models of environmental education

With the schooling of 40 million children and young people worldwide being interrupted periodically by the physical impacts of climate change, there is a critical need to support schools to address their own security and resilience, removing climate related access barriers whilst improving the relevance of the education being received (UNICEF 2023). Situated in diverse geographic regions -Asia, South America, and Africa - the schools and communities where our study is based exemplify the daily realities and inequalities caused the global climate crisis and environmental degradation. Among the young people interviewed we encountered experiences of regular landslides and floods in northern Nepal, burning of trees for charcoal and wetland reclamation in Uganda, logging, mining and agriculture; glacial melt, air, water and land pollution in Peru.

Environmental education in mainstream education predominantly focuses on actions and skills, and engage learners in practising specific behaviours (i.e. promoting 'action competence'), rather than dwelling on cognitive aims (e.g. Heimlich and Ardoin 2008; Olsson, Gericke and Boeve-de-Pauw, 2022). In our analysis of policy and curriculum documents for JustEd, we identified multiple references to the role of education as a driver for wider development challenges. For example, in Nepal, the education policy highlights the role of education to promote environment protection and to mitigate effects of climate change. Similarly, in Peru and Uganda, education is charged with enabling 'environmentally responsible' citizens (JustEd 2023). However, critics maintain that mainstream environmental education does not typically engage sufficiently with political, economic and democratic interests in environmental damage and protection.

The primary need for a critical perspective in environmental education to understand whose interests are being served, and which inequalities are being perpetuated, within transmissive teaching methods and curricula set at national level has been a concern of scholars since the beginning of this century (Jickling and Wals 2008; O'Donoghue and Lotz-Sisitka 2006; Sterling 2003). A 'radical social learning-centred transformation' of education systems (Lotz-Sisitka et al. 2016) was called for to addressing complex climate change and sustainability challenges such as those being

experienced in Nepal, Uganda and Peru, with educational approaches which can engage sufficiently with political, economic and democratic interests in environmental damage and protection. This includes a wide scope of questions addressing local, regional and global practices and systems that contribute to climate and environmental crises (e.g. Reid 2020; Singh 2020), as well as the diverse and systemic (in)justices to both humans and more-than-human natural organisms and ecosystems affected by environmental concerns (Ajaps 2023; Singh 2020). Literature suggests that environmental education may require a fundamentally different foundation in terms of values and objectives for education compared to the increasingly managerial result-oriented logic of dominant educational subjects (Reid 2020; Van Poeck and Lysgaard 2018). Ollsen, Gericke and Boeve-de-Pauw write:

> when teachers integrate holism in their teaching – meaning the environmental, social, and economic dimensions of sustainability issues – as well as focus on their past, present, and future, and on their local, regional, and global nature, learners gain an improved self-perceived action competence for sustainability (2022, 417).

The incongruence of this transformational agenda with traditional transmissive pedagogy, however, has presented challenges in terms of how environmental education can be integrated in mainstream schooling. The schism between good practices for environmental education and dominant educational practices is not entirely unique – similar voids are evident in other subjects that are typically treated as peripheral in education, for example comprehensive sexuality education, social and emotional learning, and mental health and wellbeing (Reid 2020). As written by Aitkins, McKenzie and Vaughter, 'when educational mandates focus on testing and performance this not only de-prioritizes sustainability education but also, through a reliance on individual attainment and competition, discourages an ethic of environmental and social care' (2016, 348). This highlights the tension of trying to embed an educational agenda that promotes solidarity and care within a system that valorises rational choice, whereby learners are encouraged to make the decisions that will best result in their own, individual advantage.

Our review highlights the necessity of embedding understanding of multiple forms of justice within mainstream environmental education to more effectively address the complex challenges posed by climate change. Beyond imparting scientific knowledge and individual behavioural change, environmental education must explore the interconnected political, economic, and social inequalities that contribute to climate change and environmental degradation. Using a justice lens, learners engaging in environmental education curricula are encouraged to critically assess the underlying causes of environmental crises, from individual experiences of violence and inequality, local issues of extreme weather and pollution, to global challenges like climate migration and economic exploitation, along at all levels with the power structures that shape them.

A justice approach to environmental education and pedagogy

Our understanding of justice within the context of environmental education has been developed through our reading of the authors cited in the previous section, and which draws on both notions of climate and environmental justice. We recognise that

there are multiple definitions of environmental justice, including but beyond climate change, and they are often contested, they can be multi-disciplinary, and consider diverse subjects of justice (e.g. Schlosberg 2007, Walker 2012). Considerations of environmental and climate justice are dominantly anthropocentric – that is, they consider how environmental and climate concerns relate to human survival, wellbeing and experience. For example, they consider how the distribution of environmental resources is aligned with and helps to perpetuate inequalities among human groups (e.g. Holifield, Chakraboty, and Walker 2018; Horsthemke 2009). Climate justice is a particular manifestation of this as it focuses attention on the uneven, disproportionate and intersectionally distributed impacts of climate change among humans and seeks to redress the resulting injustices in fair and equitable ways (Islam and Winkel 2017; Sultana 2022, 2022). Biocentric conceptualisations of environmental justice – which recognise that more-than-human natural entities and ecologies have rights themselves to survive and thrive – are gaining support and present a persuasive challenge to the ideas of human exceptionalism and nature as a utility for human development (Borràs 2016). Therefore, our understanding of environmental justice in education is through an education system that responds to both the environmental and social impact of climate change, environmental degradation and biodiversity loss. It considers the extent to which education is or can contribute to the survival and flourishing of the natural environment alongside considerations of equality and fairness in how humans experience, benefit from and are held accountable for the natural environment (Schlosberg 2007; Milligan et al. forthcoming).

The key conclusion of the JustEd project was that it is not enough to focus on just one justice if we are to enable justice through secondary education, particularly in contexts of multiple and intersecting injustices. Instead, we have argued for the value of an enriched and broader conceptualisation of justice in education which is grounded in Fraser's (2009) dimensions of redistribution, recognition and representation (JustEd 2023; Wilder et al. 2024; Milligan et al. forthcoming). The defining characteristic of Fraser's (2009) approach to social justice is that economic, cultural, and political dimensions of justice cannot be separated. Similarly, we argue that environmental justice cannot be achieved without a consideration of social, epistemic and transitional justice concerns within education (Schlosberg 2007; Fricker, 2007; Hall, Godrie and Heck, 2011; Sriprakash et al. 2020).

As discussed above, social justice concepts are well-represented in theorisations of climate justice. However, those related to epistemic and transitional justice have arguably been less visible in environmental justice discussions. Wilder et al. (2024) draw on JustEd data from Peru and Uganda to argue that epistemic justice is particularly interconnected to environmental and climate justice. This is because individuals and groups who most often carry the burden of environmental injustices also tend to be those who knowledges are marginalised, undervalued and silenced, particularly within formal education systems that promote Western knowledges and languages. Milligan et al. (forthcoming) further argue for the similarities in arguments made by scholars focused on environmental and transitional justice in education and the need for pedagogies that are contextualised, critical and relational and curricular content that acknowledges past violationsIn this paper, we argue that a particular focus on reparative pedagogies (Paulson 2023) – those that seek to redress historical injustices

and violence – make a valuable contribution to environmental education. Through such a multiple justices approach, we have, therefore, defined a just education as one that: is environmentally and physically safe, and free from discrimination, for everyone; recognizes and responds to children's lived experiences and is situated in the place where children live – including the histories of conflict and inequalities and contemporary experiences of violence, climate change and environmental degradation – and enables all young people to participate fully in the consumption and production of knowledge(s) needed to help prevent violent conflict, foster transformative climate action and reduce inequalities.

The key findings that we present in this paper to explain our pedagogical dimensions were broadly issues related to injustice that we identified across different curricular areas. For example, the persistent marginalisation of young people's experiences of injustice and the overemphasis on individual behaviour change were also identified in relation to the subjects of history and politics. In this paper we focus on the core aspects of the multiple justices approach specifically for environmental education and make the case for the six pedagogical dimensions that could enable justice in and through environmental education. We focus on environmental education for two reasons. Firstly, it is the part of the curriculum in all three countries where there was greatest scope for pedagogical renewal since topics are consistently included. This compares with, for example, the patchy discussion of transitional justice issues across the three countries. Secondly, the application of the multiple justices approach has particularly gained traction with policymakers and teacher trainers in Nepal and Uganda when applied to environmental education.

We follow Giroux in seeing pedagogies as encompassing the 'how' of teaching and learning, rather than only 'what' we teach which has dominated more conservative perspectives where pedagogy is described as 'a set of strategies and skills to use in order to teach prespecified subject matter' (2013, 28). A clear theme from the literature reviewed above is that current pedagogical approaches are often incompatible which what is needed to bring about meaningful climate action (see, for example, Ajaps 2023; Baldwin, Pickering, and Dale 2022; Heimlich and Ardoin 2008). The use of transmissive approaches to teaching and teacher-centred pedagogies that consider teaching merely as a one-way transfer of knowledge from teacher to learner, and exam-driven teaching strategies that highlight the importance of academic performance over transformative learning that requires change in the actions of learners and societies reinforce this viewpoint.

In line with the study's justice approach, the concept of pedagogy employed in this study closely aligns with the definition of critical pedagogy that highlights 'the importance of understanding what actually happens in classrooms and other educational settings by raising questions regarding: what the relationship is between learning and social change, what knowledge is of most worth, what it means to know something and in what direction should one desire' (Giroux 2013, 29). With these questions in mind, inspired by Gruenewald's socio-ecological insights (2003), our notion of pedagogy expands beyond instructional techniques to embrace a holistic understanding of the educational process, integrating social, cultural, and contextual dimensions and their relations with ecosystems in challenging injustices, ecological degradation, and the misrepresented historical understandings. Our concept of

pedagogy is also supported by the critical pedagogy of place aiming decolonisation- 'unlearning much of what dominant culture and schooling teaches and learning more socially just and ecologically sustainable ways of being in the world' (Gruenewald 2003, 9). Echoing Freire's (1970) transformative approach, we acknowledge the critical aspect of pedagogy in addressing societal injustices and Vygotsky's (1978) sociocultural framework finds resonance in our conceptualization, emphasizing collaborative interactions and shared learning experiences, while Piaget's (1973) stance on learners actively constructing knowledge through practical engagement adds a crucial layer to our pedagogical approach.

The six pedagogical approaches we discuss here are also discussed and presented in a practitioners-oriented handbook (JustEd 2023), which has been accredited by the Uganda National Curriculum Development Centre and which has been piloted in both Uganda and Nepal. This is not exclusively a theoretical proposal for thinking about environmental education; it is a practical tool that can and is being taken up by government education agencies with a view to realising greater justice in and through education. As we argue below, environmental education must be place-based, and therefore there must necessarily be a contextualising process that accompanies any adoption of these principles, but it is a framework that we suggest can be implemented and aligned with a wide variety of educational systems.

While a justice approach to environmental education is not limited in its applicability to learners in the Global South, we particularly focus our arguments in here because it is here that we find the millions of young people who are bearing the disproportionate share of the consequences of climate change, and witnessing environmental injustices in their daily lives (Kwauk 2020; UNICEF 2023). These young people are often living at the 'sharp-end' (Crossley and Louisy 2019) of climate emergencies and need particular pedagogies and content to support their understanding of their daily experiences and develop contextually appropriate routes to climate action. In Nepal, Peru and Uganda where the JustEd study was based, we clearly see these examples of young people living in diverse environmentally and economically precarious contexts.

Methodology

In this section, we discuss the iterative analysis process that we used to develop the six pedagogical dimensions of our proposed justice approach to secondary education. We first outline the methodology of the wider study that produced the key findings that underpin our arguments in this paper. The main research study - the JustEd project - utilised a sequential exploratory mixed methods research design (Cresswell and Clark 2011) to explore multiple aspects of secondary education and its intended and actual contribution to sustainable development goals 10 (reduced inequalities), 13 (climate action) and 16 (peace, justice and strong institutions) in Nepal, Peru and Uganda. This involved critical content analysis of policy and curriculum, case studies of classroom practice and learners' experiences of (in)justice inside and outside of twelve schools across the three countries, and a survey to explore how knowledges and experiences of justice issues correlated with young people's intended actions related to the SDGs.

Table 1. Summary of data collection process in the main study.

Quantitative data collection	Measurement of curriculum knowledge, justice experiences, attitudes, and intended actions. Questionnaire with 4142 young people across 30 schools per country.
Qualitative data collection	Document analysis: Policy, curriculum, pedagogy, learner experiences, and intended actions in secondary education.
	Individual and group participatory, arts-based activities, and discussions with young people. Interviews with teachers and head teachers.
Nepal	Four schools across Rasuwa, Lalitpur, Mahottari districts (Mountain, Hill, Terai regions). 67 classroom observations, interviews with 24 students, and 15 teachers and 4 headteachers.
Peru	Four schools across Lima, Ucayali, and Ayacucho. Interviews with 24 students, 18 teachers, and 12 school managers.
Uganda	Four schools across Kitgum and Amuru. Individual interviews with 98 learners and 20 teachers and 4headteachers, focus groups with 32 learners.

Our critical content documentary analysis (Bacchi and Goodwin 2016; Schmidt 2006), supported by policymaker interviews, included a focus on environmental education policies and curricula and textbook content in subjects where environmental issues are taught in secondary education in the three countries (see JustEd 2023 for the full dataset). We also generated qualitative data with young people ranging from 14 to 17 years old, through a series of encounters with a select group of young people by purposive sampling, including individual and small group participatory and arts-based activities and discussions focused on young people's experiences with environmental, epistemic and transitional justice, alongside interviews with teachers and head teachers (see Balarin and Rodríguez 2024; Paudel et al. 2024; Wilder et al. 2024). Across the three countries, in-depth data with 146 learners and 61 teachers and head teachers was generated. For the quantitative part of the study, 4142 learners took part in the survey. Data was analysed using structural equation modelling and multilevel regression (Shields et al. 2024). The qualitative data was analysed first by country, using NVivo to identify initial codes related to each of the justices. We then looked thematically at country level, and across the whole dataset, to identify core concepts that cut across the justices. Core concepts were then further explored through questions designed for the survey (Table 1).

Ethical approval of the study was granted by the Social Science Research Ethics Committee at the [institution name] in the UK (REF #S21-024 and S21-110), and this was accepted as a sufficient ethical review by the partner research institutions in Peru and Nepal. Ethics approval was also granted by the Ethics Committee at Gulu University, as required by the institution.

The findings presented in this paper are one part of the final theory development and data integration stage of the sequential mixed methods design (Fetters, Curry, and Creswell 2013). Our aim is to conceptualise the pedagogical dimensions of a justice approach to environmental education based on the core concepts developed through the JustEd study. To this end, the research questions can be specified as:

1. What are the key elements of a multiple justices approach for understanding the ways that secondary education can enable environmental justice?
2. How can these elements be integrated into a justice-based approach to environmental education?

The iterative analysis that was used throughout the larger study's phases was also used to develop the six dimensions discussed in this paper. We saw iteration as being 'a deeply reflexive process … sparking insight and developing meaning …[by] … visiting and revisiting the data and connecting them with emerging insights, progressively leading to refined focus and understandings' (Srivastava and Hopwood 2009, 77). The development of the six dimensions included moving iteratively between the core concepts from the JustEd study, the broader pedagogical literature related to each of the justices, and a series of discussions between the four authors. Discussion with the wider team members from a range of theoretical expertise and disciplinary backgrounds also supported the construction of our approach. The process of iterative dialogue connected the core concepts with key literature on pedagogies (e.g. Freire 1974; Gruenewald 2003; Paulson 2023; Sultana 2022; UNESCO 2021; UNICEF 2023) associated with various forms of justice. It also supported to deepen the understanding of how these pedagogies could support different justices such as environmental, epistemic, and transitional justice. For instance, reparative pedagogy is considered to be directly linked to transitional justice as it addresses the concept of violence in students' lives as an injustice and suggests related learning activities. In the findings section, we discuss the six pedagogical dimensions specifically in relation to the three key barriers we identified for environmental education. In table x we show the connections between these barriers, the pedagogical dimensions, core concepts and where we have discussed the wider evidence base from other papers generated from the JustEd study (Table 2).

Findings

Our analysis has identified six theoretical pedagogical dimensions for a justice-based approach to environmental education (see Figure 1). While we primarily discuss these separately below to show the relevance of each, they are interconnected to each other, and it is difficult to separate them out. The importance of a justice approach to environmental education comes from including all these dimensions interrelatedly together with social, epistemic and transitional justice issues.

Disconnections between what young people learn about environmental issues and their experiences of environmental (in)justices and violence

The qualitative data generated through interviews with learners and teachers and classroom observations in Nepal, Peru and Uganda indicated that curricular content and learning activities are disconnected from learners' lived experiences. Moreover, there are multiple contradictions between their experiences of injustice and the learning content, and these contradictions are rarely acknowledged or used as a starting point for classroom discussion (JustEd 2023). For instance, in a classroom observation in Kathmandu, Nepal, it was observed that while teaching about air pollution, teachers failed to link lessons to the immediate causes and effects of air pollution in Kathmandu, despite the recent school closure due to severe air pollution. Another notable example of contradictions is observed in Northern Ugandan schools. While many learners' family income was dependent on charcoal production through

Table 2. Barriers to transformative environmental education in Nepal, Peru and Uganda with their connections to core concepts.

Barrier 1: Disconnections between what young people learn about environmental issues and their experiences of environmental (in)justices	
Connects to core concepts:	Place is significant and mediates experiences and learning about (in)justices; violence in young people's lives as injustice
Identified pedagogical dimensions:	Critical pedagogy of place; Reparative pedagogy
Sources of wider evidence base:	Paudel et al. (2024); Wilder et al. (2024); Nuwategeka, Mirembe, et al. (2024)
Barrier 2: Environmental education is predominantly delivered using shallow pedagogies which limit learners' critical thinking, analysis and evaluation	
Connects to core concepts:	School as a place of epistemic injustice; limitations in formal schooling for teaching and learning about the three justices
Identified pedagogical dimensions:	Critical thinking; Interdisciplinary learning
Sources of wider evidence base:	Balarin and Rodríguez (2024); Balarin and Milligan (2024).
Barrier 3: Environmental education misrepresents the potential of individual actions for protecting the environment.	
Connects to core concepts:	Limited understanding of the relative roles and interactions across social structures and beyond individualistic responsibility; depoliticisation of justice issues
Identified pedagogical dimensions:	Individual agency and collective responsibility; systemic thinking
Sources of wider evidence base:	Wilder et al. (2024); Shields et al. (2024); Milligan et al. (2024)

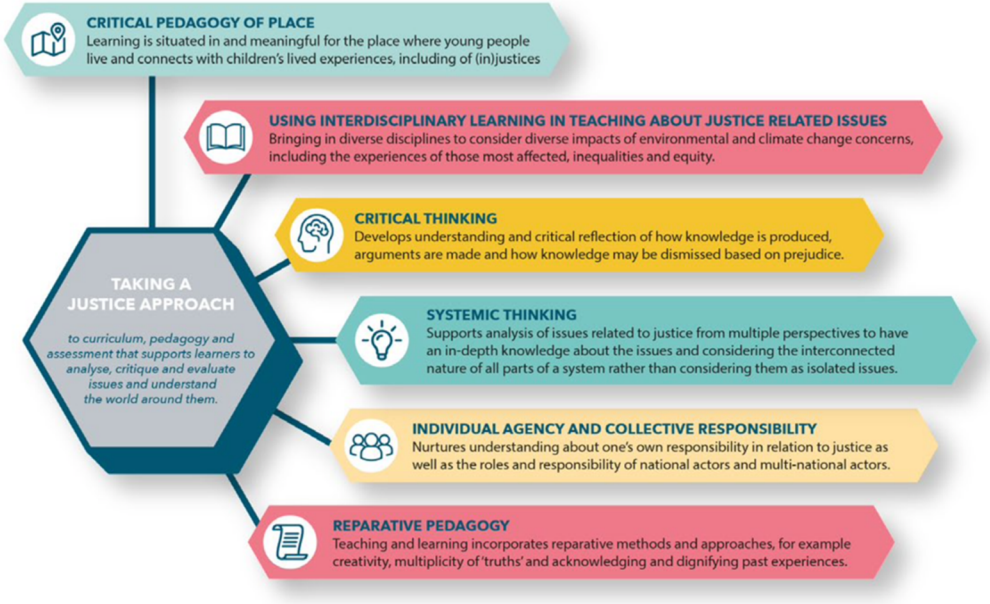

Figure 1. Six pedagogical dimensions for a justice approach to environmental education.

burning trees, curriculum analysis and interviews with teachers indicated the highlighted significance of planting and protecting trees. The data of the interviews conducted with Peruvian learners from rural and urban areas also indicate that gender issues discussed at school does not reflect the real picture of inequality of women

living in the country. At schools, although celebrating cultural, ethnic and racial diversity is emphasised, learners shared that in their lived experiences diversity is associated with social injustices. The critical part here is that teachers neither discuss these contradictions nor encourage learners to approach them with a critical perspective.

As a response to this identified barrier, the first dimension of our justice approach is the use of **critical pedagogy of place** in learning environments. Critical pedagogy of place brings together the sociological aspects of critical pedagogy (Freire 1974) and environmental aspects of place-based education (Sobel 2005). Critical pedagogy highlights the importance of relating learning in educational settings with everyday life and emphasising critical reflection between 'knowledge, authority and power' (Giroux 2011, 29) in challenging the connections between learning and social change. Place-based pedagogies promote the use of physical environments to which learners are connected (Gosselin et al. 2015; Semken 2012) and encourage learning about the local environments through field trips and the use of practical examples. However, the absence of concern for environmental matters in the critical pedagogy and the absence of social dimensions due to the emphasis mostly on ecological and rural contexts in place-based education indicated the importance of critical pedagogy of place in education (Gruenewald 2003). As critical pedagogy of place encourages a comprehensive examination of learning contexts considering local, cultural, economic, political, and ecological perspectives as interconnected elements, our approach suggests the use of it for integrating environmental justice with other forms of justice in learning environments.

These aspects of learning were remarkably absent from the secondary schools in all three countries, often despite these being aspects included in the expected curriculum delivery. Without situating school learning in the place where young people live, we repeatedly found young people struggled to express the relevance of environmental knowledge they learned in school or how they could translate this into potential routes to climate action within their own communities. By drawing on critical pedagogy of place, teachers could provide critical perspectives by analysing their local environments to encourage learners to read their local areas and take action in their communities after deciding 'what needs to be transformed or what needs to be conserved' (Gruenewald 2003, 10).

Gruenewald's concept of reinhabitation - 'learning to live well socially and ecologically in places that have been disrupted and injured' (2003, 9) - is also relevant here and connects closely with our second proposed pedagogical dimension of **reparative pedagogy**. This is particularly important in contexts of contemporary violence and/or recent histories of violence and contemporary experiences of transitioning to peace. Reparative strategies include addressing learners' histories, memories, and past and present experiences of violence (Zembylas 2017) with the importance of dignity, truth-telling, multiplicity of truths and responsibility (Paulson 2023) integrated in learning environments. They encourage the discussion of injustice issues such as racism, colonisation and discrimination to address historical and recent injustices for healing or change (Soysal & JustEd 2023). In this way, school curriculum and pedagogies can support learners walk through the past, present and future and repair the memories or experiences needed to guide what sort of action they can take for the

future. However, it should be noted here that the use of reparative pedagogy can be challenging for teachers due to its complex nature. They need to have a deep knowledge of the local and global transitional justice issues and be sensitive on embedding this dimension into their teaching environments (Soysal & JustEd 2023).

If we expect environmental education to lead to such action in the future, we see reparative pedagogies as particularly important for the young people in this study given that many of them experienced both violence and environmental degradation in their daily lives. For example, the young people in Ugandan secondary schools frequently cited examples of corporal punishment due to their mistakes in speaking English correctly as the medium of education (see, Milligan et al. 2024). Other examples include learners having their clothes stripped if they wear the wrong uniform, or being made to sit in the midday sun which is often more than 40-degree C. Learners in Nepal and Peru also discussed examples of violence, including gender-based violence, in the communities where they live. Reparative pedagogies can support young people to respond to violence in their lives, understand the interconnected nature of environmental and social injustices, and support actions for the future.

Environmental education is predominantly delivered using shallow pedagogies which limit learners' critical thinking, analysis and evaluation

The data generated in all three countries indicated the use of shallow pedagogies which aligned with Balarin and Rodrigues's (2024) description that highlighted the gap between classroom learning and students 'lived experinces combined with insufficient complexity and critical thinking hindering students' ability to engage meaningfully in learning and knowledge production. It has been observed that rather than using learner centered pedagogies, and fostering the use of higher-order thinking skills such as questioning, analysis and synthesis for active learning, teachers mostly used teacher-centred pedagogies through knowledge transmission. In Nepal and Uganda, we consistently found an overloaded curriculum that is based on content knowledge with many subjects to be covered in a limited time that created a pressure on teachers and made them use knowledge transmission streatgies in teaching with no place for critical analysis and active learning startegies. Overcrowded classes resulting in a disproportionate focus on teacher-led teaching with minimal learner interaction and maximum emphasis on content knowledge transmission for exam-based teaching and overreliance on coursebooks are among the main reasons for the limited use of critical thinking and active learning strategies that leads to knowledge production of students in learning environments. In the Ugandan schools, the fact that there are 60 learners in each class and the lessons are only 40 min are indicated by teachers among the reasons that makes it difficult for them to have discussion activities. Teachers also indicate the tight syllabus to be covered in a limited time as a burden for developing critical thinking skills in classes. The Nepal data also indicates teachers' recognition of their barriers to using necessary pedagogies to enhance critical thinking, including lack of school support and having too much to cover in the curricular content.

In Peru, learners are rarely engaged in analysing the causes and effects of environmental and social issues and the use of sustainable practices is recommended

imprecisely. Teachers mostly avoid mentioning complexities and contradictions in injustice issues such as contributions of industries to environmental and social injustices. Learners are not encouraged to contrast their ideas, to go deeper to make distinctions or understand the problems from multiple perspectives which prevented them from seeing the complexity of justice issues.

As a response to these findings, our pedagogic dimensions suggest the use of **critical thinking** and **interdisciplinary learning** in educational settings. We draw on Lai's (2011) definition of critical thinking as the ability to analyse arguments and claims and make inferences using inductive or deductive reasoning to evaluate and make decisions and solve problems. It is particularly important within environmental education because it support learners to examine the relationships between human/nonhuman environments, societal power relations and the causes and effects of everyday problems, alongside supporting learners to consider solutions (Jickling 1997; Saul 2000). Learners' transferring their critical thinking skills to new contexts is highly vital for the solutions of real-world problems.

Because of the shallow pedagogies (Balarin and Rodríguez 2024) that include rote memorization of curriculum content, it became clear in the interviews with young people that they could not consider the complex relations of environmental justice issues and transfer their knowledge and problem-solving skills to similar contexts. Instead of this, with the use of authentic examples, they can observe, interpret and evaluate the issues and make logical judgments on them. Here comes the need to emphasize the importance of the affective domain in addition to the cognitive domain for developing critical thinking skills (Hofreiter, et al. 2007). The pedagogies used in classes can encourage the use of affective domain by relating the curriculum content to learners' daily lives and making learning meaningful and purposeful for them to transfer their knowledge and skills to new environments.

In addition to this, studies indicate that interdisciplinary learning activities enhance critical thinking (Howlett, Ferreira, and Blomfield 2016; Newell 1992). Justice related issues are complex due to the economic and environmental causes and consequences. For learners to be able to interpret and evaluate justice related issues from multiple perspectives, there is a need for interdisciplinary learning to support learners in understanding the complexity of these relations by bringing together skills from various disciplines (Soysal & JustEd 2023). The documentary analysis of curricula in all three countries data indicates that most of the curricular content related to environmental education is covered in natural science subjects but not in social studies which impedes the understanding of complexity of these issues. We argue that by contrast, what is needed is pedagogies which invite learners to be active in their learning process by guiding them in making critical judgements through interpretation, analysis and evaluation of the environmental justice-related issues they face in their daily lives from multiple perspectives in different disciplines. This can support them to see the whole picture.

Environmental education misrepresents the potential of individual actions for protecting the environment

Our analysis of secondary school curricula and education policies in all three countries suggests that environmental education inaccurately assigns the responsibility of

creating and responding to environmental degradation and climate change solely to individuals. Furthermore, they fail to indicate the role of national and global political and economic policies and systems (JustEd 2023). For instance, the interviews with teachers and learners in Peruvian schools indicate that environmental issues are presented as a uniform reality and are not addressed systemically. Individuals are also equally responsible and equally affected. We found examples of individualised solutions such as rubbish collection or recycling presented as merely slogans for them to take responsibility for their actions rather than indicating the importance of systemic change. Taken together with the barrier above whereby young people's experiences of environmental injustices rendered absent from classroom practice, we suggest young people are left unsupported to understand their potential to act beyond sloganistic messaging such as 'plant trees' or 'recycle'.

As a response to this, we suggest the dimensions of **individual agency and collective responsibility**, and **systemic thinking** to be used in educational settings. We follow Koskela and Paloniemi (2023) who have used Bandura's theory of human agency to indicate that education has a significant role in encouraging individuals and nurturing collective actions. Based on this, while there is an important role for learners' own responsibilities in (in)justice issues, it also indicates the roles and responsibility of national and multinational actors finding solutions to injustice issues (Soysal & JustEd 2023).

This connects to the next dimension of systemic thinking which requires understanding how changes in one part of a system can affect the whole system (Ateskan and Lane 2018). This guides learners in understanding the earth as a system including nature, human beings and non-human beings living together and surrounded by environmental, social, economic and political subsystems and indicate their interconnectedness and interdependence with each other (Soysal & JustEd 2023). This could support young people to understand 'the interconnections between … [people's] actions and their hidden impacts on the planet, … health, and … social system' (Goleman 2009, 44).

Through understanding their role as one part of a broader system, learners can feel empowered for social and environmental change. To foster this, our approach suggests the importance of learners feeling safe and comfortable in educational settings to express and discuss their own ideas (see also, Milligan et al. 2024); and they need to work on real-life local injustice issues through problem solving activities with local stakeholders to make them aware of their individual and collective actions. This will also help with addressing the overburdening of individual responsibility that we saw in the curriculum and policies across the three countries with young people positioned as the responsible citizens for the protection of environment rather than indicating the roles of institutions, governments and economic systems.

Discussion

In this paper, we have articulated six possible pedagogical dimensions that are grounded in a multiple justices approach to environmental education. This has been based on the analysis of the existing barriers to meaningful and impactful secondary education in Nepal, Peru and Uganda. It is evident that current pedagogical approaches

to environmental education – which are mainly decontextualised from young people's lived experiences and failing to develop critical consciousness – are unlikely to enable the transformative action that is often the hoped-for outcome expressed for education's role in sustainable development. In this way, we have followed recent authors who have argued for doing environmental education differently (Ajaps 2023; Lotz-Sisitka et al. 2016; Singh 2021). Bringing in considerations from transitional justice, specifically in relation to reparative pedagogy, and epistemic justice through considerations of how pedagogies support how knowledges are consumed, recognised and produced in environmental education, has enriched these authors' arguments for environmental justice in education. In another paper written from the JustEd study, Balarin and Milligan (2024) have further argued that if we want education to lead to transformative action, then it is essential that we focus on the 'epistemic core' of educational practices that can bring about this positive relationship. They articulate the epistemic core as rich pedagogies, a diverse range of epistemic resources and openness to learners' experiences and the place where they live and argue that this is one way that education *as* justice can enable education *for* justice.

In this paper, we have considered what pedagogies could enable transformative action and we have suggested six core dimensions that could be the basis for a justice approach to environmental education. Throughout this paper, we recommend a comprehensive integration of a justice approach into entire secondary school curriculum expanding the boundaries of conventional environmental education. Our approach aims to foster the interconnectedness between environmental, epistemic and transitional justice issues across disciplines. This theoretical approach with its six core dimensions can be integrated into every subject taught at secondary schools irrespective of its association with natural or social sciences. In this way, the principles of justice approach can become an integral part of secondary education. We have developed these dimensions further, including examples of how the dimensions could be incorporated into classroom practice, in a collaboratively produced set of resources for teachers and teacher trainers on 'embedding a justice approach in secondary education' (Soysal & JustEd 2023).

Additionally, our studies to test our theoretical approach in use in the field is in progress. A guide indicating how these dimensions could be integrated into classroom practice by the teacher educators and teachers in Uganda has been prepared and in use in Uganda and Nepal for teacher training. The guide has also been approved by the National Curriculum Development Centre in Uganda for use in all secondary schools. These studies are also expected to lead to the analysis of these dimensions in practice for justice approach to environmental education for future studies.

Conclusion

Our study advances a justice-oriented pedagogical framework for environmental education in secondary schools by embedding multiple and intersecting forms of justice namely social, epistemic, and transitional within six pedagogical dimensions. Drawing on young people's lived experiences in Nepal, Peu and Uganda, our approach recognizes the complexity of justice in education and by exploring three key barriers to transformative education, we highlight the urgent need to move beyond shallow

treatments of justice through our six pedagogical dimensions including systemic and interdisciplinary thinking, critical and reparative pedagogies of place, individual action and collective responsibility. Our study highlights that meaningful environmental education cannot be achieved without a pedagogy that centres justice in all its forms and prepares learners to engage critically and ethically with the challenges of our time. We propose that only through such a comprehensive pedagogical lens can environmental education meaningfully contribute to socially just and sustainable futures.

As the result of our study is based on the findings from Peru, Nepal and Uganda, its scope is limited to the selected secondary school contexts in these three countries. Further research is needed to test the applicability and adaptability of the proposed pedagogical framework in diverse geopolitical contexts.

In conclusion, while we hope that a focus on pedagogies could bring about transformative change, we finish by highlighting that pedagogies are just one part of the educational system. It should be accompanied by the transformative change in the national curricula and teacher education systems. It is also important that considerations are given to the school environment – for example, through making schools environmentally and psychologically safe, and to the curriculum and assessment so that they are aligned with pedagogical reform. These are significant changes, but we argue that they are necessary if environmental education can be transformative and enable a '*just and sustainable* world' (UNESCO 2021).

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