



Bridging Generations:

A Dialogical Model for Intergenerational Sustainability Education

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Abstract. Sustainability is an ancient concept. Contemporary approaches to sustainability education often overlook the rich reservoirs of ancestral knowledge on how to be sustainable. In numerous cultures, including many Asian cultures, the advice of elders regarding resource conservation and financial prudence is commonplace, yet it is often excluded from formal sustainability education. Furthermore, age-segregated learning environments limit valuable opportunities for meaningful intergenerational exchange, hindering a holistic understanding of sustainability stewardship that transcends temporal boundaries.

Drawing on insights from existing literature and Paulo Freire's critical pedagogy, this conceptual paper proposes a dialogical model for intergenerational sustainability education. The model seeks to cultivate cross-generational solidarity by empowering students, educators, and community elders to integrate both lived experiences and contemporary knowledge collaboratively. The paper proposes sustainability modules co-designed by students, educators, and community elders for integration into schools and universities. Drawing on pilot initiatives in lifelong learning centres and university outreach programs, the paper outlines a range of participatory strategies, including joint problem-solving workshops, intergenerational mentoring schemes, and reflective narrative circles. These interactive methods can create dialogical spaces where lived experience, ancestral knowledge, and contemporary environmental concerns intersect.

The proposed model has the potential to not only deepen sustainability education but also nurture empathy, mutual respect, and a shared sense of collective responsibility towards the planet. This paper concludes that intergenerational dialogue is not merely a desirable pedagogical supplement but rather a fundamental democratic and collaborative imperative within education for sustainability, fostering a more inclusive and effective approach to addressing global sustainability concerns.

Keywords: Co-design, Critical pedagogy, Dialogical models.

1 Introduction

1.1 Context and Rationale

The severity of the global sustainability crisis requires educational interventions that extend beyond technical knowledge transfer and encourage cultural, ethical, and behavioural shifts. The UN's Agenda 2030, particularly Sustainable Development Goal (SDG) 4.7, highlights the transformative role of education in fostering knowledge, skills, values, and agency for sustainability (Assembly, 2015). Yet, despite ambitious international agendas, much education for sustainable development (ESD) remains narrowly rooted in scientific or technological discourse, marginalising ancestral practices and community wisdom (Sterling, 2010).

Across cultures, particularly in Asia and Indigenous communities, elders embody practices of sustainable living that have developed over centuries, such as water harvesting, crop rotation, and community-based resource management (Berkes, 2017). However, these voices are often excluded from standardised curricula that prioritise abstract, decontextualised knowledge (Tilbury, 2011).

1.2 The Problem of Age-Segregated Learning

Age-segregated educational systems create barriers between generations, reducing opportunities for cross-generational dialogue and mutual learning. This not only erodes respect for elders but also deprives younger generations of contextual perspectives necessary for long-term stewardship (Vanderbeck, 2007). Such silos conflict with relational pedagogical ideals (West et al., 2024), limiting the development of empathy and responsibility.

1.3 Research Gap

While Education for Sustainable Development (ESD) literature has increasingly embraced participatory, experiential, and place-based approaches (Chawla & Cushing, 2007), structured pedagogical models that explicitly embed intergenerational dialogue as a core educational strategy remain comparatively underdeveloped. Existing initiatives such as school gardening projects, community sustainability workshops, and eco-club activities often involve students and educators, yet older local community adults are rarely positioned as intentional co-educators, knowledge holders, or dialogical partners within formal sustainability education. For example, programs like UNESCO's whole-school sustainability frameworks and many university-led climate action projects prioritise youth engagement and peer collaboration but seldom provide a systematic model for reciprocal learning between students and elders. Similarly, while Indigenous and local ecological knowledge is increasingly acknowledged in sustainability discourse, it is often referenced conceptually rather than operationalised through structured elder-student pedagogies. Intergenerational programs such as community gardening or oral history projects demonstrate promise, but these are typically fragmented, context-specific, and not theorised as transferable curriculum design models for ESD. Consequently, there is limited scholarly development of pedagogical frameworks that intentionally integrate elders' lived experience, cultural memory, and sustainability practices into contemporary educational design. This conceptual and practical gap underpins the contribution of the current paper, which proposes intergenerational dialogue

not merely as a supplementary activity, but as a deliberate pedagogical model for sustainability education.

1.4 Theoretical Underpinnings

Intergenerational learning is grounded in theories of social learning, community of practice, and critical/dialogical pedagogy. Co-creation approaches (often derived from experience-based co-design and design thinking) explicitly position older adults as active partners rather than passive recipients, which strengthens mutual agency and ownership of educational content. Empirical co-design studies show this increases relevance and uptake of interventions aimed at social or health problems and can be adapted to sustainability curricula (Wu et al., 2022).

This paper builds on Paulo Freire's critical pedagogy (Freire, 2000), which positions education as a dialogical, liberatory process. Freire emphasises mutual learning between educators and learners, grounded in lived experience. Applying these principles, elders and students are conceptualised as co-creators of sustainability knowledge, with the dialogical model serving as a corrective to hierarchical or age-exclusive education. In an intergenerational context, Freire's framework enables dialogue across age groups to become a process of critical consciousness-raising, where both younger and older participants interrogate inherited assumptions, power relations, and socio-environmental responsibilities. This reciprocal exchange not only values elders' experiential wisdom and youth perspectives equally but also fosters collective agency for envisioning and enacting more sustainable futures.

1.5 Objectives

This paper aims to:

1. Develop a dialogical pedagogical model that integrates ancestral and scientific sustainability knowledge through intergenerational engagement.
2. Provide adaptable strategies for schools, universities, and community learning settings.
3. Position intergenerational dialogue as a democratic foundation in sustainability education.

These three objectives contribute to a significant extend in promoting empathy, mutual respect, and shared responsibility between different generations, all understood as learners.

2 Main Part

2.1 Methodology

This study adopts a conceptual, exploratory methodology. Rather than empirical testing, it synthesises existing literature on ESD, intergenerational learning, and critical

pedagogy to construct a dialogical model. Conceptual papers are appropriate for addressing gaps in theory, advancing new frameworks, and guiding future empirical research (Gilson & Goldberg, 2015). The methodological process involved:

- Literature mapping across ESD, intergenerational education, and critical pedagogy.
- Comparative analysis of pilot projects in community learning centres and higher education outreach programs.
- Model-building using Freirean dialogical principles to integrate these insights into a coherent pedagogical framework.

2.2 Research Design

The proposed dialogical intergenerational model is structured around three pillars:

1. **Co-design:** Students, educators, and elders collaboratively develop a sustainability module. Though intergenerational learning processes can take place organically in families, communities, or informal social contexts without educator mediation, educators remain a critical component in formalising, sustaining, and maximising its pedagogical potential within structured educational settings. Educators' role is vital in intentionally designing inclusive spaces for dialogue, ensuring reciprocity between generations, scaffolding critical reflection, aligning exchanges with sustainability learning outcomes, and preventing the reproduction of unexamined hierarchies or misconceptions. Thus, although educators are not strictly indispensable for intergenerational exchange to occur, their involvement significantly enhances its transformative capacity, coherence, and educational equity. Co-design between youth, educators, and elders yields several documented benefits relevant to sustainability education: curricular relevance (local knowledge incorporated), intergenerational trust, and increased cultural connectedness. Projects that employ co-creation methods report that elders contribute place-based ecological knowledge and socio-cultural narratives that contextualise sustainability concepts for younger learners, while students contribute contemporary scientific framing and digital competencies, a reciprocal complementarity that enhances sustainability literacy. Case studies and pilot co-design interventions (across health, product design, and education) indicate feasibility and improved participant engagement when elders are given genuine decision-making roles (Veloria & Boyes-Watson, 2014). Practically, this pillar may be operationalised through curriculum hackathons, intergenerational advisory panels, and case-based teaching strategies, which create structured opportunities for shared curriculum ownership and collaborative sustainability problem framing.
2. **Dialogical Practice:** Structured dialogical practices include reflective circles, mentored problem-solving workshops, and intergenerational mentoring pairs/groups. Circle practices in particular are associated with humanising classroom climates, deeper listening, and narrative sharing processes that support pro-social norms and moral imagination necessary for sustainable behaviour change. Intergenerational mentoring also appears promising: recent scoping reviews show Intergenerational Mentoring (IM) can enhance collaboration, empathy, and transfer of tacit knowledge, although authors call for stronger outcome measurement in future studies.

These practices may be enacted through reflexive circles, dialogical journaling, and community eco-walks, each of which provides concrete pedagogical mechanisms for fostering critical reflection, situated learning, and reciprocal exchange across generations.

3. Collaborative Action and Integration: Embedding intergenerational modules into schools, universities, and community centres increases reach and sustainability of initiatives. EU-funded programmes and school-based pilots demonstrate practical pathways for integration (e.g., teacher professional development, modular lesson packs, and community science partnerships). Successful integration typically requires institutional buy-in, flexibility in timetabling, and recognition of older-adult partners within safeguarding and accessibility policies. Studies of school-community partnerships for sustainable design and household practice adoption show that multi-site integration can scale local learning into community behaviour change. At the implementation level, this integration can be strengthened through collaborative problem-solving initiatives, mentoring schemes and scenario labs that connect curricular learning with real-world sustainability challenges and community action.

The proposed model is depicted below in Figure 1.

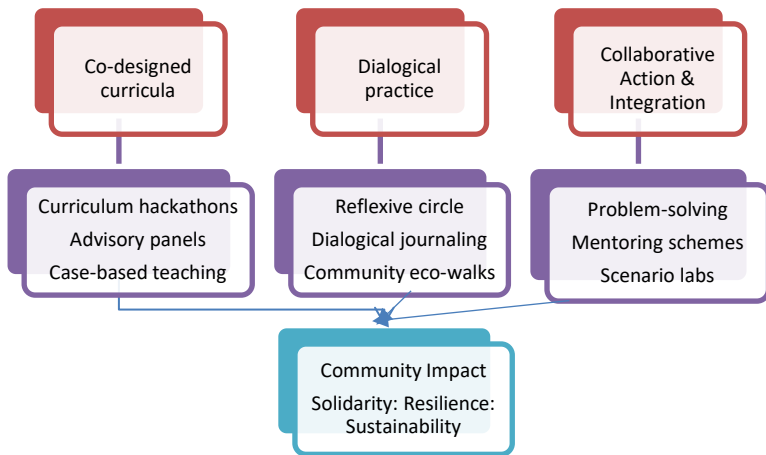


Fig. 1. Dialogical Intergenerational Model

Pilot initiatives such as the ILCES Project (Intergenerational Learning for Community and Environmental Sustainability) (Sikorska, 2018) informed the framework. This Erasmus+ initiative explicitly models elder–youth co-creation to implement Education for Sustainable Development across adult learning centres and community organisations. Descriptions and project reports highlight outcomes aligned with the proposed model: improved sustainability literacy, enhanced cross-generational respect, and practical changes to organisational practices in participating centres. Other recent pilots (e.g., i-GESS, IL4SH, campus/community co-creation events) report complementary findings, namely that intergenerational activities can deepen place-based environmental

stewardship and student environmental leadership skills. These pilots provide empirical justification for the three-pillar architecture of the proposed model while also underscoring the need for robust, mixed-methods evaluation.

2.3 Results

The proposed dialogical model yields several important outcomes, which are illustrated across various cultural and institutional contexts.

Knowledge Integration. In India, intergenerational community learning circles in rural villages have enabled youth to document ancestral practices of water harvesting and resource conservation, aligning these with contemporary climate adaptation strategies (Berkes, 2017). Indigenous communities in Canada use “story-sharing circles” where elders transmit ecological stewardship knowledge, such as sustainable hunting and forest management, while young learners introduce scientific monitoring techniques (Balantyne & Packer, 2009). In European outreach programs, elders have acted as co-facilitators in university-based sustainability projects, contributing narratives of resilience during times of scarcity (e.g., post-war resource rationing) that enrich contemporary sustainability debates (Sikorska, 2018).

Empathy and Solidarity. Engaging across generations fosters empathy and solidarity. Students gain respect for elders’ lived experiences, while elders feel valued as knowledge contributors. This dynamic strengthens collective responsibility towards sustainability (West et al., 2024). This is further explained by Table 1, which summarises the key outcomes of intergenerational sustainability education across different contexts.

Table 1. Outcomes of Intergenerational Sustainability Education

Knowledge Integration	Merging ancestral knowledge with scientific insights.	Water harvesting in India (Berkes, 2017)
Empathy & Solidarity	Building relational respect and shared responsibility.	Story-sharing in Canada (Tilbury, 2011)
Curriculum Innovation	Designing hybrid modules linking practice and theory	Intergenerational gardening in Japan (Shimpo, 2021)
Democratic Participation	Elders as co-educators in structured curricula.	ILCES Europe (West et al., 2024)

Curriculum Innovation. For example, in a paper titled ‘Garden of Hope: Ecoinertia, Nature Awareness, and Garden-Based Learning Among University Students in Kyoto, Japan’, students participating in garden-based learning developed stronger nature awareness, were more likely to make environmental lifestyle changes, and reported greater willingness to engage in sustainability practices than non-participating peers (Stevenson III, 2024). Similarly, at the community garden Seseragi Nouen in suburban Tokyo, school children and other community members are involved in composting,

kitchen waste reuse, and collaborative food cycle activities that provide environmental education and strengthen community-institution collaboration (Shimpo, 2021). The co-designed curriculum increased student engagement and fostered long-term community partnerships. Building on these pedagogical outcomes, Table 2 introduces key strategies for embedding intergenerational dialogue into sustainability curricula.

Table 2. Pedagogical Strategies for Intergenerational Dialogue

Strategy	Application in Education Context	Expected Impact
Reflective Narrative Circles	Community learning centres, universities	Mutual empathy, contextualised sustainability
Joint Problem-Solving Workshops	Schools, NGOs, urban youth projects	Practical solutions to local environmental issues
Intergenerational Mentoring	Universities, vocational training programmes	Long-term cultural transmission, mentorship
Co-designed Curriculum Units	Primary/secondary schools	Inclusive, place-based sustainability literacy

Democratic Participation. The model reframes education by positioning elders as co-educators, disrupting hierarchical teacher–student binaries. This aligns with Freire’s vision of dialogical, liberatory education (Freire, 2000). Figure 1 (Dialogical Intergenerational Model) illustrates the conceptual structure of the model, and Figure 2 (below) discusses its application pathways across educational contexts.

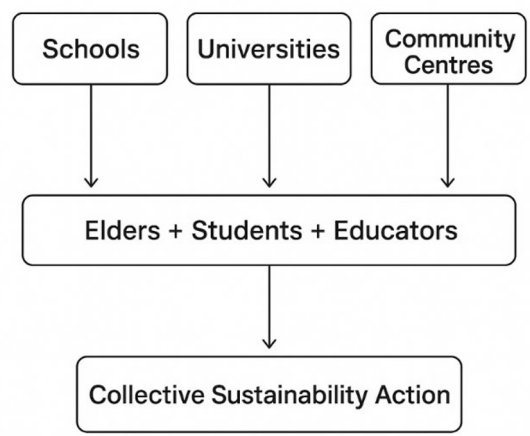


Fig. 2. Application Pathways of the Dialogical Model

3 Discussion & Reflection

3.1 Contributions to Education for Sustainability

The paper contributes to ESD by reframing intergenerational dialogue as foundational rather than supplementary. Integrating ancestral knowledge validates community wisdom, aligning with UNESCO's call for culturally relevant ESD (UNESCO, 2020). This approach challenges technocratic dominance, offering more holistic and democratic learning.

3.2 Future Applications

The model is adaptable to diverse contexts:

- Schools: Elders co-teach sustainability modules (gardening, energy saving).
- Universities: Intergenerational mentoring schemes link academic theory with lived knowledge.
- Community Centres: Reflective circles foster local ecological activism grounded in historical practice.

Scaling this approach requires partnerships between universities, local governments, and civil society. Future research could test the model empirically by evaluating student outcomes, elder participation, and long-term community impacts.

4 Conclusion

This paper has argued that sustainability education must transcend disciplinary silos and age-segregated structures by embracing intergenerational dialogue. Drawing on Freire's critical pedagogy, the proposed dialogical model integrates ancestral wisdom with contemporary knowledge, fostering empathy, respect, and shared responsibility.

By positioning elders as co-educators, the model democratises sustainability education and enriches curricula with the lived cultural experiences of older adults. Ultimately, intergenerational dialogue should not be regarded as an optional pedagogical supplement but as a democratic imperative for cultivating inclusive, transformative, and culturally grounded sustainability education.

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