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Constructing a Transformative Sustainability Pedagogy: Teacher Empowerment for a Sustainable Future

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Abstract

The article demonstrates an action research approach for constructing Transformative Sustainability Pedagogy (TSP) to empower teachers for a sustainable future. The starting point for the TSP was a Transformative Education for Gross National Happiness (GNH) teacher action research project in Bhutan (2010–2013) – a collaboration between the author, co-researcher and the Royal Education Council. Two Leadership Training Courses (LTC) were developed for teachers from seven schools based on critical/transformative pedagogy. The aim of the courses was to empower the teachers to carry out action research to infuse their schools with GNH principles and practices. The project concluded in 2013, and the results showed that the LTC transformative pedagogy and action research approach had successfully empowered teachers to act and promote GNH in their schools. Nine years on, the author re-analyzed the project data to identify the empowering pedagogical principles and construct TSP grounded in ecological principles and values.

Keywords: action research, critical pedagogy, Gross National Happiness, teacher empowerment, transformative sustainability pedagogy

Introduction

Action research has been an effective approach used by the author to develop transformative pedagogy to empower teachers to promote non-discrimination, equity and social justice (Bedford, 2009). Building on this research, the article demonstrates the construction of Transformative Sustainability Pedagogy (TSP) with not only a social dimension of sustainability but also environmental, economic and cultural dimensions. The starting point was to revisit the Transformative Education for Gross National Happiness (GNH) teacher action research project in Bhutan (2010–2013).

GNH is Bhutan's unique overarching development goal with socio-economic, cultural, environmental, and political pillars. This holistic strong sustainability paradigm is attributed to the 4th King of Bhutan, Jigme Singye Wangchuck, who in 1972 stated that GNH was more important than GNP (Gross National Product). In other words, happiness and well-being are more important than material wealth.

Teachers from seven Paro schools participated in two week-long Leadership Training Courses (LTC) with the aim to carry out action research to infuse their schools with GNH principles and practices.

The article begins with a summary of the GNH project including: (1) the initial theoretical framework and methodological approach for constructing the LTC transformative pedagogy; (2) the content areas of the LTC and (3) an evaluation of the empowerment of LTC participants to promote GNH in their schools. It is followed by a re-analysis of project data collected (nine years after its conclusion) to identify the empowering pedagogical principles of the LTC, which are then incorporated into constructing the Transformative Sustainability Pedagogy (TSP) framework, grounded in ecological principles and values. This TSP is then discussed and its relationship to other critical sustainability pedagogies.

Transformative Education for GNH Action Research Project

The Transformative Education for GNH project provided a fitting context for constructing TSP given Bhutan's strong sustainability paradigm of GNH. In addition to the 4 pillars of GNH: good governance, sustainable socio-economic development, cultural preservation, and environmental conservation, there are nine domains which include ecological diversity and resilience, living standards and community vitality. There are also 33 indicators grouped under these nine domains¹.

The Transformative Education for GNH project was a partnership between the author, co-researcher, the Royal Education Council, and teachers from seven schools in Paro, Bhutan. The aim of the project was to develop the capacity of the teachers to design and implement initiatives to infuse their schools with GNH practices and principles (Cooper & Bedford, 2017).

Theoretical Framework and Methodological Approach for Constructing the LTC Transformative Pedagogy

The project commenced in 2010 with an initial theoretical framework for constructing the LTC transformative pedagogy consisting of:

- (1) Ethical principles and values of GNH: ecological diversity, resilience and integrity, well-being of all sentient beings, cultural diversity, community vitality, peace, compassion, dignity and esteem, equality, rights protection, democracy (Ura, 2009, 2012, 2021);
- (2) Empowerment concepts: transformative, active, latent empowerment (Bedford 2009);
- (3) Critical pedagogy theories: e.g., Freire (1970, 1973, 1994, 1998), Shor (1992);
- (4) GNH content areas (4 GNH pillars).

Critical pedagogy theories provide a relevant starting point as they are concerned with consciousness raising and actions to transform the world (Kincheloe & McLaren, 1994). The methodological approach for constructing the LTC transformative pedagogy was based on critical action research (e.g., Carr & Kemmis, 1986, 2005), adopted because of its aim to empower individuals and groups to engage in actions for personal, institutional, and societal change.

The author collected and analyzed data prior to and during the courses, as well as afterwards when the teachers returned to their schools to carry out their action research plans. The data were used to further develop the *LTC transformative pedagogy* with two action research cycles each with four phases as follows:

Phase 1: Planning:

Planning the LTC based on the initial theoretical framework for constructing the transformative pedagogy.

Phase 2: Action:

Carrying out the LTC with teachers.

Phase 3: Observation:

Evaluation of LTC transformative pedagogy and post-course actions in schools and the empowerment of participants.

Phase 4: Reflection:

Reflection on phases 1 to 3 followed by the second cycle beginning with Phase 1 – Planning of the next LTC.

Overall, the action research approach was a critical praxis, which provided a vehicle for reflective action to promote a sustainable future, and was characterized by the following principles:

- A catalyst for fostering personal, school and societal change for GNH/sustainability;
- Consciousness raising, empowerment, and activism of participants;
- Collaborative, experiential, and democratic participation in a self-critical community;
- Spiralling cycles of planning, action, observation, and reflection to construct empowering pedagogical theory and practice to foster teacher empowerment for GNH/sustainability.

The Transformative Education for GNH Leadership Training Courses

The first LTC took place in May 2011 in Paro, Bhutan, with 25 teachers from seven local schools. The main objective was for teachers to develop action research, transformative pedagogy, media literacy and ICT skills across the curriculum to promote GNH/sustainability in their respective schools. At the end of the LTC, teachers had developed a GNH action research plan to implement on returning to their schools supported by the Royal Education Council.

Participants were introduced to planning, action, evaluation, and reflection phases of action research cycles, and discussed methods and tools for accomplishing each phase. At the end of the course, participants from each school had developed a GNH action research plan with concrete ideas they could use not only to affect their own teaching, but also influence the whole school to promote GNH/sustainability.

The action research projects carried out after the course mostly had an environmental focus and included creating a recreational area, providing clean and safe water, waste management and planting trees.

Participant feedback collected during the first LTC, evaluations by the local coordinators, the authors and co-researcher's evaluations and reflections, the teachers' first cycle action research reports, second cycle draft action plans and project correspondence were analysed from a pedagogical and empowerment perspective and provided the basis for further development of the second Leadership Training Course, which took place in 2012 with mostly the same teachers. During the course transformative pedagogy, media literacy and ICT skills were explored in more depth. In addition, participants engaged in GNH documentary film-making to later introduce in their schools and developed a new one-year GNH action research plan.

By the end of the second Leadership Training Course, the teachers had revised and presented their second GNH action research plans. Additionally, each school group made and showed a short film depicting how GNH values were infused in daily school life (Cooper & Bedford, 2017).

Teacher Empowerment and Evaluation of Actions in Schools

As part of the final project evaluation, the author and co-researcher spent two weeks in Paro in May/June 2013 visiting participating schools and interviewing the teachers about their action research. This provided an opportunity to collect more data on the empowerment of the teachers and actions they carried out.

We visited the six schools that had participated in both Leadership Training Courses with a local coordinator and carried out one-hour, semi-structured open question interviews with each group of teachers. We also discussed the action research and Education for GNH with most school principals, toured the schools and observed some lessons. We used the data gained to evaluate the participants' second LTC activities and reports on post-course actions during the second cycle. Content analysis was applied to the data using the author's empowerment concepts summarized in Table 1.

Table 1

Types of Empowerment (Bedford, 2009)

Empowerment type	Description
Latent empowerment	A feeling of having more drive, ability, and possibility to act individually and/or collectively to foster GNH/sustainability that has not yet led to actions (activism)
Active empowerment	Having more drive, ability, and possibility to act individually and/or collectively to foster GNH/sustainability that has led to actions (activism)
Transformative empowerment	Having more drive, ability, and possibility to act individually and/or collectively to promote GNH/sustainability that has led to action (activism) and the desired transformation

Immediately after each LTC, all teachers expressed an increase in drive, ability and possibility to promote GNH in their schools (latent empowerment). Within the year after each Leadership Training Course, all participants had engaged in some form of activism (active empowerment). Furthermore, the teachers mostly reported that their

GNH actions had achieved their desired outcomes, which demonstrated transformative empowerment.

However, some participants had faced barriers to carrying out their actions, such as opposition within their own schools or lack of time and resources; therefore, they sometimes did not feel empowered.

The Empowering Pedagogical Principles of the LTC

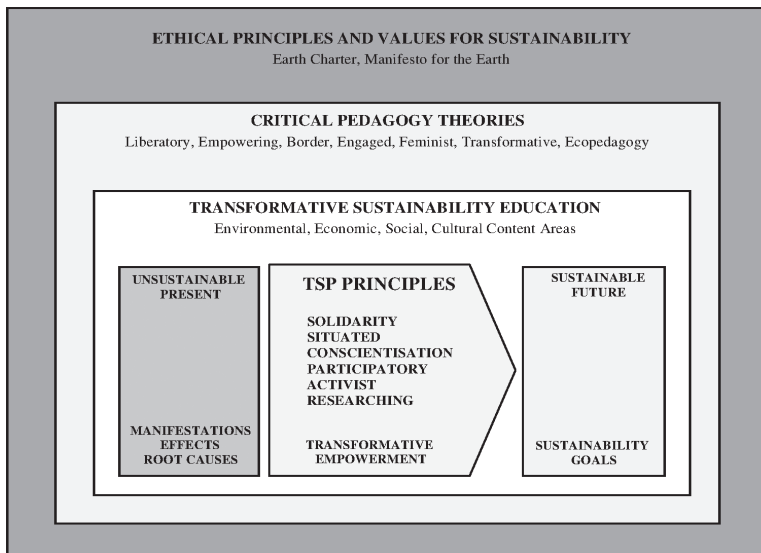
Nine years after the conclusion of the action research in Bhutan, the author undertook a re-analysis of data on the empowering pedagogical principles of the LTC. The relevant data included: (1) the project training manual with descriptions of all the workshops and course materials; (2) written documents created during workshops; (3) individual workshop observations; (4) participant evaluations of the LTC course and (5) semi-structured interviews with the participants at the end of the project.

Beginning with a theory-guided content analysis of the training manual, the data were coded using the initial pedagogical principles, and looking for redundant or emergent categories, or whether to combine the categories. It was proceeded by an abductive process to code the rest of the data above, which reflected the participants' and training team's views on what actually happened during the LTC. The result was the following six empowering pedagogical principles of the LTC: Solidarity, Conscientising, Activist, Situated, Participatory, and Researching. These are the principles that guided the teaching of the Leadership Training Courses and subsequently incorporated into the Transformative Sustainability Framework to empower teachers to foster a sustainable future.

Framework for Transformative Sustainability Pedagogy

The pedagogy constructed for the Bhutan project is a specific empowering TSP with a foundation of GNH principles and values for a sustainable future. In this section, a general TSP framework is presented with a foundation of ecological principles and values, four pillars of Transformative Sustainability Education and the six transformative pedagogy principles above (grounded in critical pedagogy) to foster transformative empowerment for sustainability (see Figure 1).

The TSP framework also shows the desired transformation from an unsustainable present to a sustainable future, with an emphasis on raising awareness of the manifestations, effects and root causes of unsustainability. The five main parts of the framework are discussed below: (1) ethical principles and values for sustainability; (2) transformative empowerment concept; (3) critical pedagogy theories; (4) content areas of transformative sustainability education and (5) the empowering principles of the TSP.

Figure 1*Framework for Transformative Sustainability Pedagogy***Ethical Principles and Values for Sustainability**

Ethical principles and values for sustainability are the foundation of the TSP drawing on two relevant sources. The first source is the Earth Charter (Earth Charter Commission, 2000), which is a declaration of fundamental ethical principles for building a just and sustainable world. The charter has sixteen principles organized under four pillars: Respect and Care for the Community of Life, Ecological Integrity, Social and Economic Justice, and Democracy, Nonviolence, and Peace.

The second source of principles with an ecological worldview is the 'Manifesto for the Earth' (Mosquin & Rowe, 2004). This Manifesto contains six core principles similar to the Earth Charter and notably from a critical pedagogy perspective five action principles: (1) Defend and Preserve Earth's Creative Potential; (2) Reduce Human Population Size; (3) Reduce Human Consumption of Earth Parts; (4) Promote Ecocentric Governance; (5) Spread the Message. The Charter and the Manifesto emphasize that the principle of ecological integrity is paramount as the foundation of sustainability education. They reflect the fact that the planet can sustain ecology without an economy, but it cannot sustain an economy without ecology (Daly, 1990, 2005 Reddy & Thomson, 2014).

Transformative Empowerment Concept

Transformative empowerment of individuals and groups to act and promote sustainability is the aim of the TSP. This has previously been defined as having more drive, ability, and possibility to act individually and/or collectively to promote sustainability that has led to action (activism) and the desired transformation (Bedford, 2009). Drive is motivation, inclination, determination or enthusiasm to act. Ability is mental

or physical capacity or skills to act. Possibility is opportunities or chances to act. The existence of all three components of empowerment are important for transformation to occur. For example, without drive or possibility there will be no action, and without ability action will be ineffective. The definition reflects the instrumental value of empowerment, which is agency that gives rise to transformative action.

Critical Pedagogy Theories

Critical pedagogies share the aim of empowerment and conscientisation that develop an understanding of the root causes of problems, such as climate change, biodiversity loss and pollution, and create an inner power that enables individuals and groups to become activists to radically change the world. Therefore, critical pedagogies provide a solid foundation for TSP. While critical pedagogies share some common assumptions, aims, and practices, they also have their own nuances and emphases. A variety of pedagogies are shown in the framework and include liberatory pedagogy (Freire, 1970, 1973, 1994, 1998), engaged pedagogy (hooks, 1994), border pedagogy (Giroux, 1991, 1997), feminist pedagogy (Weiler, 1991), empowering education (Shor, 1992), transformative (Bedford, 2009) and ecopedagogy (Kahn, 2010).

Content Areas of Transformative Sustainability Education

The content areas are specific to a particular course or project of Transformative Sustainability Education. In general, these are environmental, economic, social and cultural content areas.

Empowering Pedagogical Principles of the Transformative Sustainability Pedagogy

Based on the analysis of Transformative Education for GNH action research project, there are six empowering pedagogical principles of the Transformative Sustainability Pedagogy.

Table 2

Transformative Sustainability Pedagogy Empowering Pedagogical Principles

Pedagogical Principle	Description
1. Solidarity	Shared ethical principles and values bind learning communities together with strength and unity in diversity to act with a common purpose and mutual support to promote sustainable living. Solidarity is also expressed in a harmonious and caring relationship between humans and non-humans.
2. Situated	Education needs to be relevant to the life experiences of learners. This includes place-based and indigenous education with authentic learning about real-world sustainability problems, i.e. interdisciplinary, holistic, and makes connections between the local and global.

See next page for continuation of table

Continuation of Table 2

3. Conscientisation	Conscientisation develops critical awareness of social and environmental problems facing the world that through reflection leads to critical action. It is a systemic approach that focuses on the manifestations, effects and root causes of problems of unsustainability and alternative ecological paradigms such as de-growth, post-growth and steady state economy. Visioning for a sustainable future and back-casting assists the development of strategies for transformation.
4. Participatory	Teaching and learning that are inquiry-based, experiential, constructivist, dialogical, engaged, democratic, cooperative and collaborative.
5. Activist	Developing a critical understanding of sustainability problems that impels to action to transform schools and society.
6. Researching	Critical action research connects the theory and practice of sustainability through project-based learning and reflective practices.

Discussion

The world faces considerable sustainability challenges, including climate change, environmental degradation, deforestation, pollution, loss of biodiversity, poverty, inequality, and mass extinction. Due to an increase in population, production, consumption and waste, planetary boundaries have been exceeded (Rockstrom et al., 2009). The demand for resources is currently 1.56 times more than the amount that Earth can regenerate (Almond et al., 2020, p. 56). Unequal access to and use of natural resources drive both global poverty and environmental destruction. The wealthiest 20 per cent of the world's population account for 80 per cent of consumption of global resources (Christian Aid, 2012). Furthermore, the richest one percent is responsible for more than twice as much carbon pollution as the 3.1 billion people who make up the poorest half of humanity (Oxfam International, 2020).

UNESCO has been at the forefront of developing education for sustainable development (ESD) to address these global problems, and since 2019 has promoted Education for Sustainable Development Goals (ESDG) or 'ESD for 2030' (UNESCO, 2016, 2017). However, ESGD is fundamentally flawed because the SDGs (United Nations, 2015) are built on a foundation of economic growth, and as such are unsustainable (Kopnina, 2020). Given limits to decoupling growth from ecological impacts, more economic growth will lead to an increase in material and energy use, further depleting natural resources and exacerbating environmental degradation. As Bogović and Čegar (2012) point out, in the long run a 'sustainable economy may exist only in a sustainable symbiosis with the natural system, upholding natural laws and respecting natural limits of economic growth.' Therefore, as economic growth is the means to achieve the SDG goals, this will result in further harm to the planet.

To create sustainable societies, excessive consumption of resources needs to be curbed in order to live within the earth's carrying capacity. Given the ESGDs promote a failing economic model that does not respect planetary boundaries and impedes the implementation of deep structural change needed for sustainability, this calls for radical rethinking of ESD. However, ESD having become entangled with SDGs makes it unlikely that the hegemonic principles underpinning sustainable development will be critically examined, debated, tested, and applied.

However, in October 2021 UNESCO released its latest report by the International Commission on the Futures of Education (UNESCO, 2021). Significantly, the report acknowledges that education has been complicit in supporting an economic growth model that has been harmful to the planet and calls for a paradigm shift from an anthropocentric towards an ecocentric education:

For too long, education itself has been based on an economic growth-focused modernization development paradigm. But there are early signs that we are moving towards a new ecologically oriented education rooted in understandings that can rebalance our ways of living on Earth and recognize its inter-dependent systems and their limits (p. 33).

The report also mentions the need for new approaches to learning beyond the teacher-centered transmission model. Amongst these approaches, there is action research that can contribute to an education that is ‘understood not merely as a field for the application of external experimentation and study, but as a field of inquiry and analysis itself’ (p. 123). Furthermore, the report goes on to say that ‘action-research pedagogies can engage students in acquiring, applying, and generating knowledge simultaneously’ (p. 99), and also that action research can help ‘to reinvent the school as a learning organization itself’ (p. 101).

The action research described in this article proved to be a powerful methodological approach to promote sustainability education and develop TSP. Action research based approaches have been used in other areas of sustainability education. Gedžūne & Gedžūne (2011) carried out educational action research with 39 first-year students of pre-school and primary school teacher education programs taking part in the course “Environmental Pedagogy” at Daugavpils University, Latvia. The study aimed at encouraging students’ reflection on ecological consciousness and building sustainable inclusive relationships with the world. The study found that educational action research is a useful tool for reorienting teacher education towards sustainability, and that it was an ‘important step towards helping pre-service teachers become conscious, dedicated, wise and creative agents of change, able to recognize unsustainability and exclusion in human activity and reorient it towards inclusion and sustainability’ (p. 57).

Koutoulas-Makrakis (2011) carried out a study based on action research with 30 pre-service teachers participating in the course “Teaching Methodology and Education for Sustainable Development” at the University of Crete, Greece. The research was aimed at transforming thinking and action towards sustainability, including creating conditions for systems thinking when dealing with sustainability issues, and developing an awareness of the interrelations between the social, cultural, environmental and economic dimensions of sustainability. Through reflective practice, participants were able to deconstruct and reconstruct their theories and practices of teaching in more emancipatory ways addressing issues of education for sustainable development (ESD). This case study also helped towards understanding the nature of change process towards teaching and learning for more sustainable futures.

Educational action research was conducted by Salite et al. (2009) with the participation of three researchers and 38 first-year pre-school students and basic school teacher education programs at Daugavpils University, Latvia. The research focused on the characteristics of phronetic processes and attitudes towards own and other species. One outcome of the study was ideas about how higher education could promote implementation of

the idea of teacher-researcher, and also how it was possible to propose educational action research that was grounded in the process of phronesis or a strategic approach for the development of phronetic skills important to sustainability education.

Omeje et al. (2020) carried out collaborative action research focused on construction waste reduction awareness as a step within Education for Sustainable Development at the University of Nigeria, Nsukka. This study involved investigating the knowledge of the building construction students and site-workers. Both cause and reduction of construction waste were noted to be human related, thereby necessitating a campaign against construction waste at various sites, with the aim of raising motivated and inspired change agents. The research showed that reduction measures could ‘help a community, team or individuals change actions, catch a vision in line with waste reduction, define approaches to undertake and join the global move for sustainability consciousness’ (p. 80).

Salite et al. (2016) aimed at establishing an open transdisciplinary research framework in ESD necessary for undertaking action research, which ‘can open a new perspective for understanding and interpretation of the complex phenomenon of sustainability’ (p.135). Participatory action research has the potential to expand university cooperation with a stakeholder approach and develop research around sustainability phenomenon. Furthermore, participatory action research is viewed as a means to achieve quality education for sustainable development by reorienting the society and education towards sustainability.

These cases show that action research can play a part in bringing about a paradigm shift towards an ecologically orientated education. Action research belongs to one of the six principles of TSP which is based on critical pedagogy with a foundation of ecocentric ethical principles and values for sustainability. As such TSP can be described as an ecopedagogy, which Hung (2021) defines as the joining of ecology and pedagogy – an education based on an ecological worldview and *ecojustice*. Misiaszek (2020) concurs and goes on to define ecopedagogies as grounded in critical, Freirean pedagogies that raise awareness of the root causes of environmental destruction and human actions and geared towards increased social and environmental justice and planetary sustainability.

Kahn (2010) traces the roots of ecopedagogy back to the second Earth Summit in 1992 held in Rio de Janeiro, Brazil, from which later emerged the Earth Charter in 2000. Antunes and Gadotti (2005) from the Paulo Freire Institute in Brasil argue that ecopedagogy is the appropriate pedagogy to the Earth Charter – a set of ethical principles and values for sustainability, which are part of the TSP.

Conclusion

The author’s Transformative Sustainability Pedagogy (TSP) is an inclusive, integrated ethical framework for an education to guide the transition to a sustainable future. The construction of the TSP is grounded in both theory and practice. The initial theoretical ideas were based on critical pedagogies and the context for the practice was two Leadership Training Courses to empower teachers to promote GNH. Action research provided the methodology for teachers to carry out their GNH action plans in their schools, and it was also the approach for developing the pedagogy for the LTCs.

The results demonstrated the effectiveness of action research and transformative pedagogy to empower teachers to identify, implement, and evaluate changes in teaching

and school practices. All the teachers had carried out actions within their schools to promote GNH demonstrating transformative empowerment. Furthermore, the analysis of the second LTC showed that it was characterized by six pedagogical principles: Solidarity, Situated, Conscientisation, Participatory, Activist, and Researching.

These six principles were incorporated into constructing the TSP framework along with (1) ethical principles and values for sustainability; (2) transformative empowerment concept; (3) critical pedagogy theories; (4) content areas of transformative sustainability education. The resultant TSP is a radical and empowering pedagogy to uncover the root causes of sustainability challenges and to promote actions for a sustainable future. As such, TSP represents both ‘an education that takes us into the depth of things’ (Schumacher, 1997, p. 206), and ‘deep ESD’ (in contrast to ‘shallow ESD’), which is rooted in fundamental principles such as equity, resilience, de-growth, planetary conscience, ecological integrity, earth rights and democracy (Nagata, 2017). TSP represents a paradigm shift towards a critical education with an ecological worldview and is part of the ecopedagogy family.

Ecopedagogies are diverse, but as Grigorov and Fieuri (2012) point out ‘the common thing in the different ecopedagogy contexts is their participatory anti-hegemonic perspective promoting a new Earth’s paradigm’ (p. 439). Furthermore, ecopedagogies (like the TSP) have often been co-constructed in learning communities with a participatory place-based approach – as the ‘International Handbook of Ecopedagogy’ (Grigorov, 2012) is a testament to. These initiatives are what Nagata and Singer (2017, p. 30) call ‘esd with lower case letters’ as opposed to ‘ESD with capital letters’. The latter is mainstream ESD of UNESCO, governments and international organizations. The former is grassroots esd and includes formal and informal education, endogenous development and human-scale education that seek to make a difference despite the fundamental flaws of ESD and its attachment to unsustainable growth-based SDGs.

Given the scale of the task to create a sustainable future, there needs to be an urgent paradigm shift in mainstream ESD towards an education that fosters sustainable well-being for all within the limits of a finite planet. Until then, hope for a sustainable future rest with local grassroots ‘lower-case esd’ ecopedagogy initiatives.

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Note

(1) The nine domains of GNH: Ecological diversity and resilience, good governance, psychological wellbeing, health, education, time use, cultural diversity and resilience, community vitality and living standards. There are also 33 indicators grouped under these nine domains. See the Transformative Education for GNH website at: <https://education4gnh.webs.com>

References

- Almond, R.E.A., Grooten, M., & Peterson, T. (Eds.). (2020). Living Planet Report 2020 – Bending the curve of biodiversity loss. World Wildlife Fund.
- Antunes, A., & Gadotti, M. (2005). Ecopedagogy as the appropriate pedagogy to the Earth Charter process. In P. Blaze, M. Vilela, & A. Roerin (Eds.), *The Earth Charter in action: Toward a sustainable development* (pp. 135–137). Kit Publisher.
- Bedford, T. (2009). *Promoting educational equity through teacher empowerment. Web-assisted transformative action research as a counter-heteronormative praxis*. Doctoral Dissertation. University of Oulu. <http://herkules.oulu.fi/isbn9789514290572/isbn9789514290572.pdf>
- Bogović, N., & Čegar, S. (2012). Education principles in a model of strong sustainability. *Problems of Education in the 21st Century*, 44, 10–19. <https://doi.org/10.33225/pec/12.44.10>
- Carr, W., & Kemmis, S. (1986). *Becoming critical: Education, knowledge and action research*. Falmer. <https://doi.org/10.4324/9780203496626>
- Carr, W., & Kemmis, S. (2005). Staying critical. *Educational Action Research*, 13(3), 347–358. <https://doi.org/10.1080/09650790500200316>
- Christian Aid. (2012). The rich, the poor and the future of the Earth: Equity in a constrained world. https://www.christianaid.org.uk/sites/default/files/2017-08/rich-poor-future-earth-equity-constrained-world-april-2012_0.pdf
- Cooper, R., & Bedford, T. (2017). Transformative education for gross national happiness: A teacher action research project in Bhutan. In L. Rowell, C. Bruce, J. Shosh, & M. Riel (Eds.), *The Palgrave international handbook of action research* (pp. 265–278). Palgrave Macmillan. https://doi.org/10.1057/978-1-137-40523-4_17
- Daly, H. E. (1990). Toward some operational principles of sustainable development. *Ecological Economics*, 2, 1–6. [https://doi.org/10.1016/0921-8009\(90\)90010-R](https://doi.org/10.1016/0921-8009(90)90010-R)
- Daly, H. E. (2005, September). Economics in a full world. *Scientific American*, 100–107. <https://doi.org/10.1038/scientificamerican0905-100>
- Earth Charter Commission. (2000). *The Earth Charter*. Earth Charter International Secretariat. <http://www.environmentandsociety.org/node/2795>
- Freire, P. (1970). *Pedagogy of the oppressed*. Continuum. https://doi.org/10.1007/978-1-4614-5583-7_610
- Freire, P. (1973). *Education for critical consciousness*. Seabury Press.
- Freire, P. (1994). *Pedagogy of hope: Reliving pedagogy of the oppressed*. Continuum.
- Freire, P. (1998). *Pedagogy of freedom: Ethics, democracy, and civic courage. Critical perspectives series*. Rowman & Littlefield Publishers.
- Gedžūne, I., & Gedžūne, G. (2011). Exploring and promoting ecological consciousness in teacher education: The possibilities of educational action research in education for sustainable development. *Journal of Teacher Education for Sustainability*, 13(1), 43–61. <https://doi.org/10.2478/v10099-011-0004-2>
- Giroux, H. A. (Ed.). (1991). *Postmodernism, feminism, and cultural politics: Redrawing educational boundaries*. State University of New York Press.
- Giroux, H. A. (1997). *Pedagogy and the politics of hope: Theory, culture, and schooling. A critical reader*. Westview Press. <https://doi.org/10.4324/9780429498428>
- Grigorov, S. (Ed.). (2012). *International handbook of ecopedagogy for students, educators and parents. A project for a new eco-sustainable civilization*. BCSLDE. www.bcslde.org

- Grigorov, S., & Fleuri, R. (2012). Ecopedagogy: Educating for a new eco-social intercultural perspective. *Visão Global, Joaçaba*, 15(1–2), 433–454.
- hooks, b. (1994). *Teaching to transgress: Education as the practice of freedom*. Routledge.
- Hung, R. (2021). Ecopedagogy and education. In R. Hung (Ed.), *Oxford research encyclopedia of education*. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190264093.013.1502>
- Kahn, R. (2010). *Critical pedagogy, ecoliteracy, and planetary crisis: The ecopedagogy movement*. Peter Lang.
- Kincheloe, N., & McLaren, P. (2000). Rethinking critical theory and qualitative research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp. 303–342). Sage.
- Kopnina, H. (2020). Education for Sustainable Development Goals (ESDG): What is wrong with ESGDs, and what can we do better? *Education Sciences*, 10(10), 261. <https://doi.org/10.3390/educsci10100261>
- Kostoulas-Makrakis, N. (2011). Developing and applying a critical and transformative model to address ESD in teacher education. *Journal of Teacher Education for Sustainability*, 12(2), 17–26. <https://doi.org/10.2478/v10099-009-0051-0>
- Misiaszek, G. W. (2020). *Ecopedagogy: Critical environmental teaching for planetary justice and global sustainable development*. Bloomsbury Academic.
- Mosquin, T., & Rowe, S. (2004). A manifesto for Earth. *Biodiversity*, 5(1), 3–9. <https://doi.org/10.1080/14888386.2004.9712713>
- Nagata, Y. (2017). A critical review of education for sustainable development (ESD) in Japan: Beyond the practice of pouring new wine into old bottles. Educational studies in Japan. *International Yearbook*, 1, 29–4.
- Nagata, Y., & Singer, J. (2017). Formal ESD in Japan: Dissolving walls between classroom and community. In J. Singer et al. (Eds.), *Educating for sustainability in Japan: Fostering resilient communities after the triple disaster* (p. 330). Routledge.
- Omeje, H., Okereke, G., & Chukwu, D. (2020). Construction waste reduction awareness: Action research. *Journal of Teacher Education for Sustainability*, 22(1), 66–83. <https://doi.org/10.2478/jtes-2020-0006>
- Oxfam International. (2020). *Carbon emissions of richest 1 percent more than double the emissions of the poorest half of humanity*. <https://www.oxfam.org/en/press-releases/carbon-emissions-richest-1-percent-more-double-emissions-poorest-half-humanity>
- Reddy, T. L., & Thomson, R. J. (2014). Social and economic sustainability: Implications for actuarial science. Presented at the Actuarial Society of South Africa's 2014 Convention. Cape Town International Convention Centre.
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S. III, Lambin, E., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H., Nykvist, B., De Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., ... Foley, J. (2009). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society*, 14(2), 32. <http://www.ecologyandsociety.org/vol14/iss2/art32/>
- Salite, I., Drelinga, E., Iliško, D., Oļehnoviča, E., & Zariņa, S. (2016). Sustainability from the transdisciplinary perspective: An action research strategy for continuing education program development. *Journal of Teacher Education for Sustainability*, 18(2), 135–152. <https://doi.org/10.1515/jtes-2016-0020>

- Salite, I., Gedžūne, G., & Gedžūne, I. (2009). Educational action research for sustainability: Seeking wisdom of insight in teacher education. *Journal of Teacher Education for Sustainability*, 11(2), 14–30. <https://doi.org/10.2478/v10099-009-0037-y>
- Schumacher, E. F. (1997). *This I believe' and other essays* (essay first published in 1974). Green Books.
- Shor, I. (1992). *Empowering education: Critical teaching for social change*. University of Chicago Press.
- UNESCO. (2016). *Education for people and planet: Creating sustainable futures for all*. <https://en.unesco.org/gem-report/report/2016/education-people-and-planet-creating-sustainable-futures-all>
- UNESCO. (2017). *Education for sustainable development goals*. <https://www.sdg4education2030.org/education-sustainable-development-goals-learning-objectives-unesco-2017>
- UNESCO. (2021). *Reimagining our futures together: A new social contract for education*. <https://unesdoc.unesco.org/ark:/48223/pf0000379707>
- United Nations. (2015). Resolution 70/1: Transforming our world: The 2030 agenda for sustainable development. https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf
- Ura, K. (2009). *A proposal for GNH value education in schools*. <http://www.grossnationalhappiness.com/PowerPoints/value-education.pdf>
- Ura, K. (2021). Gross national happiness represents the holistic potential of our mind and body: Dasho Karma Ura. India Today Web Desk. <https://www.indiatoday.in/happiness-quest/story/gross-national-happiness-represents-the-holistic-potential-of-our-mind-and-body-dasho-karma-ura-1859259-2021-09-30>
- Ura, K., Alkire, S., Zangmo, T., & Wangdi, K. (2012). An extensive analysis of GNH index, Thimphu: Centre for Bhutan Studies. <https://doi.org/10.35648/20.500.12413/11781/ii036>
- Weiler, K. (1991). Freire and a feminist pedagogy of difference. *Harvard Educational Review*, 61, 449–474. <https://doi.org/10.17763/haer.61.4.a102265jl68rju84>

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