Steps to an Ecology of Lifelong-Lifewide Learning for Sustainable, Regenerative Futures

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Abstract

We have reached a turning point in our history where an urgent and critical priority has emerged – not only do we have to learn for ourselves and for the health of society and economy, we also have to learn for others and the health and vitality of our planet. The wicked problem of our future survival is framed by the United Nations 2030 Agenda for Sustainable Development, which offers 17 Sustainable Development Goals (SDGs). Education has its own goal – SDG#4, to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." The aim of this SDG is to educate the world to encourage and support sustainable development, but it also contains within it a new and important role for lifelong learning – to enable individuals and societies to learn how to sustain themselves and the world. It's a vision and culture that reaches beyond promoting lifelong learning opportunities for all, to the idea that "the

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whole of life is learning therefore education can have no ending" (Lindeman, C. (1926). *The meaning of adult education.* New York, NY: New Republic (1989 edn) Oklahoma Research Center for continuing professional and higher education. Retrieved from https://openlibrary.org/books/OL14361073M/The_mean ing_of_adult_education).

Optimistic views of the future guide us toward a new Ecological Age (Berry, T. (1988). *The dream of the earth.* Berkley, CA: Counterpoint), an emergent Ecological Civilization (Lent, J. (2021). What does an ecological civilization look like? *YES Magazine* Spring 2021. Retrieved from: https://www.yesmagazine.org/issue/ecological-civilization/2021/02/16/what-does-ecological-civilization-look-like), and a universal culture of lifelong learning (UNESCO. (2020b). *Embracing a culture of lifelong learning: Contribution to the futures of education initiative report. A transdisciplinary expert consultation*. Paris, France: UNESCO Institute for Lifelong Learning. Retrieved from https://www.sdg4education2030.org/embracing-culture-lifelong-learning-uil-september-2020). But to achieve this cultural transition and live our lives in a sustainable, regenerative way, humanity must embrace an ecological world view within which all human activities, including learning, are understood in relationship to the world in which they are enacted. This chapter advocates that we are ecological interbeings, enacting life within and with an ecological world of relationships, connectivity, and interdependency. If we are to succeed in "learning for sustainable regenerative futures," we need a vision and concept of lifelong learning and action that embraces consciously and explicitly the lifewide dimensions of learning in everyday life and its fundamentally ecological character. We also need systems and institutions for education that encourage and support an ecological worldview and a broader moral purpose that includes learning for others and encompasses the health and vitality of our life sustaining planet.

Introduction: Learning for a Fragile, Unsustainable World

The history of mankind is a history of learning and using learning to achieve things of value at all scales from individuals, through groups and communities, to nations and beyond. As a species we are who we are, for better or worse, because of what we have learnt. For much of our history as a species our learning has been deeply connected to the ecological principles that enable all life to flourish. But as human populations have grown and more technologically advanced societies have emerged, we have become progressively decoupled from these principles (Berry 1988, 1999). Only now is science revealing the full extent of the damage we have caused to many

of the systems that support life on our planet (Rockström et al. 2009). So great are the effects of humans on the planet that science accepts we have entered a new geological era. "We now live in the Anthropocene, in which humans constitute the largest force for change on the planet, exceeding the variability and shocks caused by shifts in Earth's orbit, earthquakes, and volcanic eruptions" (Gaffney and Rockström 2022, p. 68).

We have reached a tipping point in human history in which our past and current behaviors are upsetting the balance of a fragile world and are likely to bring about our own demise unless we change what we are doing. But changing what we are doing is fundamentally dependent on our ability to learn and become wiser and adapt to this new reality. "Unless we re-design our ability to learn together in a way that cultivates our collective potential, we diminish prospects of the continuation of the human experiment on Earth" (Luksha et al. 2017, p. 2). We can look at this situation in despair – why have we brought ourselves to the edge of destruction? Or, as this essay chooses, we can look at our situation with optimism – the transition we have to make is a necessary part of our evolution as an intelligent species. This essay shares ideas about learning that might help us make this transition.

A significant part of the wicked problem of our future survival is framed by the United Nations 2030 Agenda for Sustainable Development (UN General Assembly Resolution 70/1), which offers 17 Sustainable Development Goals (SDGs) Table 1.

Education has its own goal – SDG#4 "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UNESCO 2015). Furthermore, this SDG gives education a new role – to encourage behaviors that will support sustainable development. An important part of this new role is to educate the world into new ways of understanding, which actively embrace learning as the core regenerative process of mankind. Learning and creating meaning from and through our interactions with our world is perhaps the fundamental difference between ourselves and the intelligent machines that are increasingly displacing human activity – especially work (Susskind 2020). A world in which there is less work for humans to do is another important reason for why a new paradigm and culture of lifelong learning must be sought.

The rational, data-driven approach that underpins our present unsustainable culture tends to keep us stuck in the past and the present reducing sustainability to mere extrapolation of what already exists (Zammit-Lucia 2013). This view is consistent with a critical review of literature on learning for sustainable development undertaken by Boström et al. (2018) who identify a bias toward an individualistic and cognitive view of learning as the transfer of information, and a notion of learning outcomes as adaptation within current structures. In their view (ibid., p.13) the conditions for the transformative learning necessary for a culture that supports learning for sustainable futures requires us to: (1) acknowledge that learning and change are anchored in practice; (2) emphasize that transformative learning is a process of examining, questioning, and revising frames of references and perspectives hitherto taken for granted; (3) acknowledge that learning includes cognitive and social, moral and affective components; and (4) acknowledge that social context, social relations, and power conditions are integral to learning processes.

Table 1 United Nations 17 Sustainable Development Goals (UN General Assembly Resolution 70/1)

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable, and modern energy for all
8. Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient, and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
15. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation, and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Prompted by the SDGs, education systems all over the world are beginning a journey to support the societal and cultural transformations necessary to achieve a more sustainable world (UNESCO 2020a), but can this happen without fundamental changes in the way we educate people and develop their understandings of what learning means? UNESCOs most recent proposals for renewing education recognize that "Curricula must embrace an ecological understanding of humanity that rebalances the way we relate to Earth as a living planet and our singular home" (UNESCO Futures of Education Commission 2021, p. 4). But the report fails to recognize that learning itself is the fundamental ecological phenomenon that connects us to our living planet and its continuous formation (Barnett and Jackson 2020).

What Do We Mean by Sustainable Regenerative Futures?

To "sustain" means to keep something going or provide support so that somehing endures. In the context of this essay we are concerned with securing a future that enables the Earth's biosphere and human civilization to coexist and this depends on maintaining the balance in both living and nonliving systems like the atmosphere

and hydrosphere. The term "regenerative" takes us beyond the idea of maintenance to processes and practices that grow, restore, renew, or revitalize themselves. Daniel Wahl, drawing on the ideas of Bill Reed, has done much to explore the idea of sustainability he says that what we are trying to sustain is the underlying pattern of health, resilience, and adaptability that maintains our planet in a condition where life as a whole can flourish. He sees the issue as not so much about maintaining the status quo but of creating environments, conditions, and cultures for regeneration (Wahl 2016, p. 43).

> Regenerative design engages and focuses on the evolution of the whole of the system of which we are part. Logically, our place – community, watershed and bioregion – is the sphere in which we can participate. By engaging all the key stakeholders and processes of the place – humans, other biotic systems, earth systems, and the consciousness that connects them – the design process builds the capability of people and the 'more than human' participants toengage in continuous and healthy relationship through co-evolution (Reed 2007, p. 677)

Our contributions to sustainable regenerative practices begin with awareness of the living and nonliving systems of which we are a part and mindful of the consequences of particular actions in the contexts, situations, and circumstances that make up our lives. By participating in experiments aimed at sustaining and regenerating the world around us, we learn through our experiences and in the process regenerate ourselves. "Regenerative practice starts and continues with [learning and] personal development. It is not a tool but a practice of conscious participation and co-creation" (Wahl 2021).

It is our persistent intention to be generative: that is to try to create more value than we consume, that builds a world of increasing possibilities. In this way practices that aim to be sustainable and regenerative today improve possibilities for the future.

We cannot hope to solve the multitude of sustainability problems without human imagination, creativity, ingenuity, and resourcefulness. Imagination and creativity lie at the heart of our generative capacity. "The world must resort to the ultimate renewable resource: human ingenuity and creativity. Creativity is at the heart of sustainability, rooted in sustainable social, economic, environmental and cultural practices. It is a special kind of renewable resource and human talent" (d'Orville 2019, p. 65).

The recognition that education and learning for sustainable regenerative futures is a whole of life commitment and practice (UNESCO 2020b) means that any policy that is focused only on formal education will not develop the culture that is necessary to achieve the SDGs. What is required is an expanded vision of lifelong learning and action as a lifewide (every part of life at any point in time) lifelong (every point in time along the journey of life) process, and a culture that values learning in all its forms and in every aspect of life. It's a vision and culture that reaches beyond the SDG#4 goal – "promote lifelong learning opportunities for all" to "the whole of life is learning therefore education can have no ending" (Lindeman 1926, p. 6). As noted above, a person's generative capacity and motivations for being creative grow out of the situations in the lifewide dimension of their life so an enhanced concept of

lifelong learning for sustainable regenerative futures needs to explicitly recognize the lifewide dimension of learning and action.

But this democratic and inspiring vision for lifelong learning is far removed from the way policy makers or even educators understand lifelong learning. According to Elfert (2020),

> although lifelong learning has become pervasive as an educational policy paradigm in the past decades. . .. it remains a highly misunderstood and obscure concept. . . What is missing in the current policy attention to lifelong learning under SDG 4 is a debate about what lifelong learning means and about the many challenges that remain in the realization of lifelong learning in its full potential, characterized by . . .the "maximalist" vision of a learning society, which involved "a fundamental transformation of society" (Cropley 1979, p. 105). . .We will have to make a decision whether we want lifelong learning to be a transformative vision, as promised by the SDGs. . .. or just another passing fad in the never-ending cycle of development agendas

So how do we get from where we are now to a world in which people are able to learn in order to transform themselves and the planet? The UNESCO Futures of Education initiative aims to rethink education, knowledge production, and learning from a future-oriented perspective. The first report of this initiative (UNESCO 2020b) presents a future-focused vision that demands a major shift toward a culture of lifelong learning by 2050. It argues that the unprecedented challenges humanity faces, require societies to embrace and support learning throughout life and people who identify themselves as learners throughout their lives.

> This 2050 vision is of a world that has undergone a deep cultural shift based on a strong awareness of the innate potential of learning. Societies self-consciously strive to be learning societies and people identify as lifelong learners. With a continuous learning ethos pervading all spheres of life. (UNESCO 2020b, pp. 12–13)

The political and educational challenge for UN/UNESCO is to encourage, educate, guide, and nurture at a global scale, a multitude of educational systems, cultures, communities, and societies to practically embrace the co-created vision of lifelong learning for all within a context where learning through and across life contributes positively to the UNs 17 Sustainable Development Goals.

> "Lifelong learning is about the sustained and sustainable freedom of individuals, linking social freedom to environmental responsibility. At an individual level, lifelong learning now contributes to a greater awareness of all the dimensions of sustainability. Individuals are empowered by lifelong learning to change behavioural patterns,"
>
>   "learning for oneself, for others and for the planet. . . has a key role in driving sustainability" (UNESCO 2020b, p. 14)

This Chapter draws inspiration from this vision of lifelong learning for the regeneration of ourselves, our social groups and communities, the natural environments containing living and nonliving things, and the planet more generally. It draws attention to two important ideas that can contribute to an enriched and actionable

concept of lifelong learning for sustainable regenerative futures. The first is the explicit recognition that learning and action take place in a multitude of contexts, situations, and environments across the lifewide dimension of our everyday life and that this continues throughout our lifespan. The second explicitly recognizes that learning, practice, and achievement are ecological phenomenon and that we are ecological beings/interbeings, living and acting in an ecological world.

Lifewide Learning

The concept of lifewide learning was first described by Reischmann (1986, p. 3), "To make [us] aware of this wide 'universe', the whole life embracing understanding of the learning of adults, I will use the expression 'lifewide learning'." The idea was subsequently developed and applied in higher education (Jackson et al. 2011). Lifewide learning entered the policy literature in 2000.

> *The term 'lifelong' learning draws attention to time: learning throughout life, either continuously or periodically. The newly-coined term 'lifewide' learning enriches the picture by drawing attention to the spread of learning, which can take place across the full range of our lives at any one stage in our lives. The 'lifewide' dimension brings the complementarity of formal, non-formal and informal learning into sharper focus. It reminds us that useful and enjoyable learning can and does take place in the family, in leisure time, in community life and in daily worklife. Lifewide learning also makes us realise that teaching and learning are themselves roles and activities that can be changed and exchanged in different times and places.* (Commission of the European Communities 2000, pp. 8–9 emphasis is in the original document)

In 2010 the EU commissioned a Foresight Study drawing on leading thinkers in the world of education and informal learning. The report of this study, "The Future of Learning: Preparing for Change" (Redecker et al. 2011) incorporated the concept of lifewide learning into its central learning paradigm.

> The overall vision is that personalisation, collaboration and informalisation (informal learning) will be at the core of learning in the future. . .. The central learning paradigm is thus characterised by lifelong and lifewide learning and shaped by the ubiquity of Information and Communication Technologies (ICT). (Redecker et al. 2011, pp. 9–10)

Unfortunately, the policy world has continued to subsume the idea of lifewide learning within the concept of lifelong learning, perhaps because it adds too much complexity to the idea. The new context of learning for sustainable regenerative futures creates a new environment to develop the richer concept of lifelong-lifewide learning to achieve, "a more holistic understanding of lifelong learning" (UNESCO 2020b). Lifewide learning adds the detail and purpose to the lifelong pattern of human development (Jackson 2011a, p. 2) by recognizing that most people, no matter what their age or circumstances, simultaneously inhabit a number of different spaces – like work or education, being a member of a family, being involved in clubs or societies, caring for others, participating in their local community, engaging in
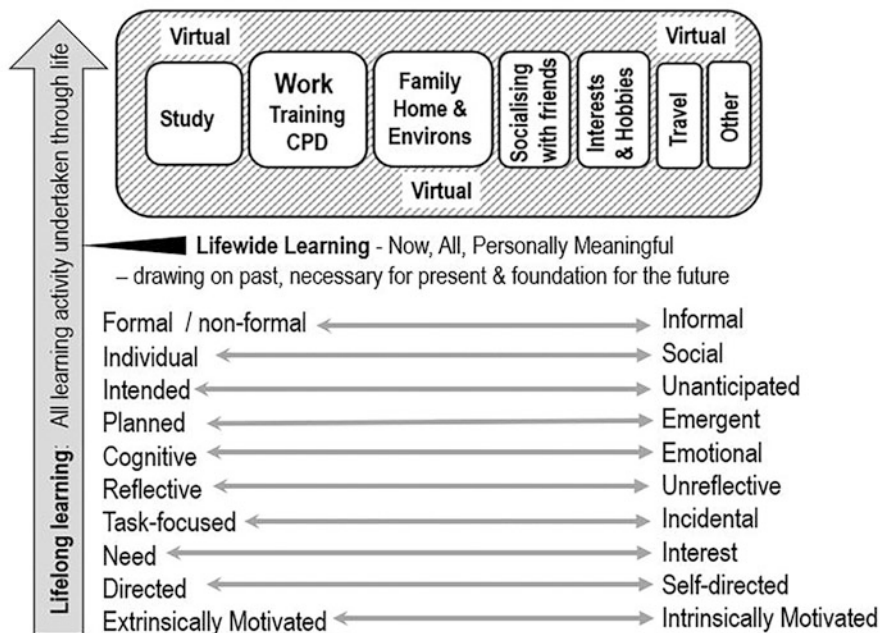
Fig. 1 A conceptual framework for lifewide learning (Jackson 2011a). By making the lifewide learning explicit we recognize all forms of learning and all the contexts and environments in which learning occurs

sport and other activities to keep fit, traveling, and looking after their own well-being mentally, physically, and spiritually (Fig. 1). In this way the multiple timeframes of lifelong learning and the multiple spaces and places (environments) for lifewide learning intermingle and who we are and who we are becoming are the consequences of this intermingling. This last idea is crucial to the idea that lifelong learning for a sustainable (or unsustainable!) future is a continuous process of becoming that is revealed and enacted in the lifewide dimension of our life.

The concept of lifewide learning provides the most comprehensive and inclusive framework within which we can understand learning, personal development, and action. Because of this lifewide learning provides the foundation for a better understanding of the holistic nature of lifelong learning. Figure 1 illustrates some of the environments that typify our lives. Each environment is characterized by its own rhythms and time frames, places and spaces, people, activities, and experiences. In these different parts of our life, we think and interact with different people, have different sorts of relationships, adopt different roles and identities, experience the full range of human emotions including failure as well as success. In these different places and spaces we inhabit, we engage in different sorts of challenges and problems, seize, create, or miss opportunities. We try to achieve specific goals and aspire to achieve our longer-term ambitions. We learn to love and ultimately experience our own demise.

It is in the lifewide dimension of our life where our positive and negative effects on our natural and social world are manifest – for example when we travel, when we care for our garden, when we go shopping, or engage in a building project. It is in this dimension of our life that we can experiment and learn to change our behaviors in ways that minimize the damage we cause to others or our environment and optimize potential future benefits.

It is in the lifewide dimension of our life that we learn what it is to be human in the contexts of our own lives. We learn how to deal with setbacks and tragedies and learn to be resilient when confronted with significant disruptions and challenges. Through our lifewide experiences we create the multiple narratives that give meaning to our life and use our imaginations to contemplate what has been and what might be.

Because every individual's lifewide learning is a product of themselves interacting with their unique environments and set of circumstances, learning, development, and achievement are unique to every individual on the planet. It is this uniqueness that is our unique source of creativity that is the generative force for a sustainable regenerative world. Illustrations of how people use their imaginations and creativity to generate solutions to sustainability problems in their everyday lives are described by Meroni (2007).

> Creativity is the disposition of thought and behaviour that enables us to imagine and put into practice [sustainable] solutions [such] as: time banks, home nursery playgroups, car-sharing, ethical purchasing groups, producer markets, self-help groups for the elderly, shared gardens, eco-sustainable villages, vegetable gardens in parks, weblogs, co-housing, neighbourhood self-management, home restaurants, local micro-logistics, community supported agriculture, tool exchange, elective communities, small producer networks...and more! (Meroni 2007, p. 9)

Lifewide Education

Lifewide Education is the pedagogical incorporation of lifewide learning into formal education (Barnett 2011; Jackson 2011a, 2014). It recognizes the lifewide dimension of learning, development, and achievement and enables the learner to view themselves as the designer of an integrated, meaningful life experience that incorporates formal education as one component of a richer set of experiences that embrace all forms of learning and achievement across their life.

The foundation of lifewide education is a "lifewide curriculum" (Jackson 2011b and Fig. 2). A lifewide curriculum encourages learners to see the whole of their life experiences as opportunities for their own development and achievements: such as making a positive impact on their world. A lifewide curriculum enables learners to integrate learning, development, and achievement from any aspect of their lives into their educational experience. It also enables learners to apply in their daily life what they have learnt in formal educational settings. It blurs the boundaries between formal, nonformal and informal learning and views all experiences as sites with potential for learning and development. We must however acknowledge that these terms are generally not used by higher education institutions or practitioners but they
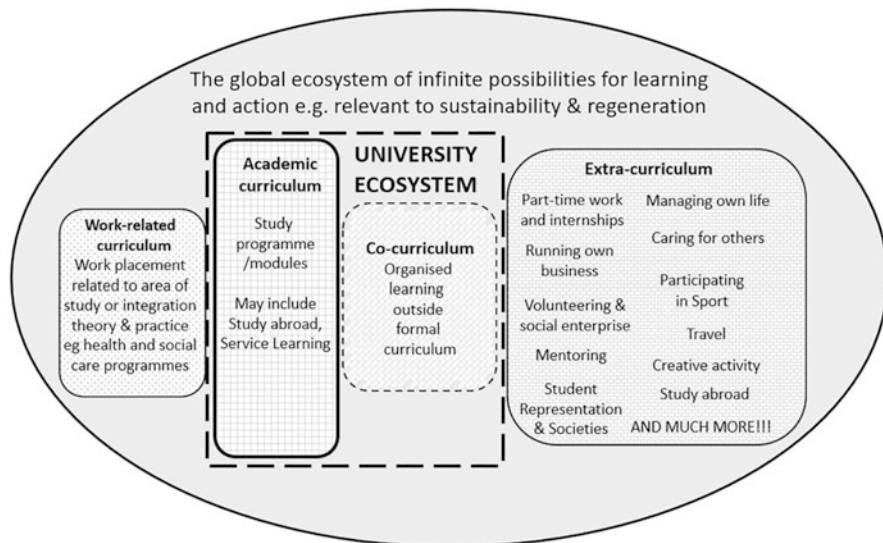
Fig. 2 Representation of a lifewide curriculum in a higher education context. (Adapted from Jackson 2011b)

must become part of the vocabulary if a new culture of lifelong-lifewide learning is to be nurtured.

A lifewide curriculum shifts the focus for learning from a "skills, standards and outcomes model of curriculum and learning [to] a reflexive, collective, developmental and process-oriented model" (Barnett and Coate 2005, p. 18). It shifts learning from a single academic context to learning in and for a range of contexts some of which are located in the institutional environment and some in the world of infinite possibilities outside this environment. A lifewide curriculum focuses attention on the importance of developing agency for acting in the continuous stream of situations that make up learners' lives and it shows learners that their educational institution values the choices they are making about how they are conducting their lives. In framing the curriculum in this way, we are championing the idea that agency and capability are, "essentially one of freedom – the range of options a person has in deciding what kind of life to lead" (Dreze and Sen 1995, p. 11). In revealing their lifewide curriculum an individual is choosing to reveal how they are authoring their life (Magolda 2011). In implementing a lifewide curriculum an educational institution is laying the foundation for the explicit recognition of the lifewide dimension of lifelong learning and a new culture that values and supports this concept of learning.

According to Barnett (2004), education that is focused on the present is formed around knowledge-rich and skills-based curricula necessary to perform in a world that is known. Whereas a curriculum that is future-oriented engages learners with the ontological dimension of being human in a world of uncertainty that is constantly reforming, in which they are constantly undergoing as they learn how to adapt to what is constantly emerging. His argument provides a philosophical foundation for a

"pedagogy for future learning" and the idea that lifelong learning is a never-ending process of becoming. I argue that we only come to understand how we undergo or become a different (better or worse) version of ourself, by embracing the lifewide dimension of living and learning.

Illustration of Lifewide Education in Higher Education

The challenge for education is not only to recognize that "the whole of life involves learning therefore education can have no endings," it is also to value and recognize learning, development, and achievements that emerge in the personal interpretation and implementation of a lifewide curriculum. There will be many different ways of achieving such recognition but Jackson, Betts, and Willis (2011) provide one example, in the form of a university "lifewide learning award," based on a lifewide curriculum and a process in which the learner:

(a) Maps the domains for potential learning and development in their own life
(b) Identifies aspects of themselves they would like to develop in the context of their own lifewide curriculum through a lifewide experience plan
(c) Executes the plan and records their experiences and the development they gained
(d) Creates a narrative that synthesizes their experiences and what they have learnt and makes claims for their own learning and development.

This experiment provided the foundation for the Lifewide Education community of interest and a generic Lifewide Development Award which can be accessed at https://www.lifewideeducation.uk/lifewide-development-award.html

Lifewide Learning and Education for Sustainable, Regenerative Futures

One of the biggest barriers to learning how to sustain ourselves and the planet are the beliefs and habits that make us reproduce what we do in an unsustainable way.

> We seem not to get rid of unsustainable behaviour patterns in our daily lives. Time after time we manage to collectively create results nobody wants. This is true with regard to environmental and social problems, for instance, climate change and refugee waves sweeping over Europe. These problems, and the unwanted results seem to be linked to our narrow understanding of the complex interactions between environmental, social, economic and cultural issues. But this does not explain the continuing bad decisions and detrimental behaviour patterns; we do not seem to learn from our mistakes (Laininen 2019, pp. 161–62)

The way we challenge and change our beliefs, abandon old habits, and create new habits is in the lifewide dimension of our life through a combination of education for sustainable development and experiments in trying to live for a sustainable future.

This is why the development and implementation of lifewide education and lifewide learning is so important to the achievement of the SDGs.

Laininen also makes this point in her argument for transformative learning for a sustainable future.

> *Transformative learning for a sustainable future is defined as learning that transforms our existential understanding and conceptions about the interdependence of humans and nature, the essence of humanity, fundamentals of wellbeing, and the role of economy in our world and daily lives*
>
> *The centre of knowledge content is not subjects or sciences, but the wholeness of our world and our lives. Learning focuses around understanding the connections between humans, nature, society and the economy with an aim to develop solutions for our sustainability challenges and making a sustainable world real while learning. Learners' own life experiences have to become part of the learning substance, and participation in change processes within society must become part of learning.* (Laininen 2019, p. 180 author's emphasis)

It is in the lifewide dimension of our life that we can appreciate ourselves as a whole person in relationships with others and the world through which we can develop a "deep realisation and coherence of the purpose, direction, values, choices and actions of [our] life" (Laininen 2019, p. 180).

We can chose to act in ways that sustain ourselves, others, and the world or act in ways that are in opposition to this goal.

Illustration of Adult Lifewide Learning for Sustainable Regenerative Futures

In late 2021, an international collective of adult learners undertook an experience-based inquiry into the ways in which they engaged with and experienced the sustainable development goals in their own lives (Jackson et al. 2021). Participants produced a personal statement of past and current engagements with the 17 SDGs and one vignette each week over 3 weeks describing how they had engaged with one or more of the SDGs. The inquiry demonstrated that all participants were engaging with the goals in a multitude of ways but that some goals were more important than others to individuals.

A mapping tool was developed (Table 2) to show the potential environments and sites for SDG-related activity in a person's life and the ways in which this activity influenced, or had potential to influence, the world at three levels (micro – only self and immediate environment, meso – local environment, macro – wider environment). In a demonstration project the tool was used to analyze a sample of vignettes (Jackson and Willis 2022). The exercise revealed the lifewide nature of individuals' engagements with the SDGs strengthening the argument for making the lifewide dimension of learning explicit within the concept of lifelong learning.

But the question remains as to what motivates us to act and learn in ways that are consistent with the SDGs. We need to be motivated to act to change existing and

Table 2 Tool to map SDG-related activity across the lifewide dimensions of a person's life (Jackson and Willis 2022)

Potential Environments & Sites for SDG-related Activity *Lifewide Learning and Action*	MICRO	MESO	MACRO
Work/professional life & practice community/networks			▓
Formal study /CPD			
Self-education/informal learning individual (micro) & social (meso)	▓		
Research – finding out about things (academic & non-academic)	▓		
Virtual world – email, internet searches and sites, forums	▓		
Family & friends – conversations and other social interactions, doing things together, parenting, eating, playing,	▓		
Home & garden, allotment – doing things like fixing, making, growing, experimenting	▓		
Local environs – doing things like shopping, walking and exercising, interactions with community or natural environment, meetings with a purpose, socialising			
Hobbies & interests - leisure activities and pursuits, entertainment	▓		▓
Travel - experiencing other cultures, supporting indigenous people			
Providing donations, gifts and other forms of support - for local, national or international organisations who help people in need (or non-human life).	▓		
Working in partnership with others			▓
Political and/or environmental activism – including using democratic right to vote and to campaign for social and environmental justice			

Explanation: The shaded cells show the sites that were active in my vignette 1 story of engaging with SDG. Micro – what we do in your personal/work life that impacts only on ourselves and those immediately around us, Meso – what we do in our personal/work life that impacts on our neighborhood or your local environment, Macro – what we do in your personal/work life that impacts regionally, nationally, or internationally

develop new habits, and to commit to sustained and repeated action. The same study reported above used a modified version of Alderfer's Existence, Relatedness and Growth theory (Alderfer 1969) to map the needs and concerns that motivated action (Jackson and Willis 2022, p. 74), recognizing that the needs that motivate us must extend beyond ourselves into caring for the world around us.

Toward an Ecological Concept of Learning

While a new culture of learning that values and integrates all forms of learning throughout and across a person's life is an important and necessary goal, if people are to own and participate in the SDGs, we also need a concept of learning that educates people to see themselves as ecological beings acting in an ecological world. In fact, we are not just beings – isolated entities moving through the world, we are interbeings, deeply connected, related to, and interdependent on other people and living and nonliving things. We are also deeply connected to ourselves to our life histories and experiences, to our values and beliefs, our emotions, our concerns, and the things we care about. In the words of Thich Nhat Hanh "Everything relies on everything else in the cosmos in order to manifest—whether a star, a cloud, a flower,

a tree, or you and me." "We cannot just be by ourselves alone. We have to inter-be with every other thing" (Hanh 2017, p. 14).

Such an ideal was elaborated in a Foresight Paper commissioned by the UNESCO Lifelong Learning Institute.

> this paper calls for education to be reimagined and reconfigured around the future survival of the planet. To this end, it offers seven visionary declarations of what education could look like in 2050 and beyond. These declarations proceed from three premises. Firstly, human and planetary sustainability is one and the same thing. Secondly, any attempts to achieve sustainable futures that continue to separate humans off from the rest of the world are delusional and futile. And thirdly, education needs to play a pivotal role in radically reconfiguring our place and agency within this interdependent world. This requires a complete paradigm shift: from learning about the world in order to act upon it, to learning to become with the world around us. Our future survival depends on our capacity to make this shift. (Common Worlds Research Collective 2020, p. 2)

The proposition underlying this chapter is that by understanding learning and practice as ecological phenomena, we are more likely to be able to make this transition. The Foresight Paper offers seven speculative but visionary declarations of what education and learning beyond education should be like if the premises were accepted and acted upon (summarized in Table 3). Declarations 2, 3, and 5 are particularly important from an ecological perspective.

Table 3 Visionary declarations for education by 2050. UNESCO commissioned Foresight Working Paper (Common Worlds Research Collective 2020, pp. 2–8)

1. By 2050, we have critically reassessed and reconfigured the relationship between education and humanism. We now retain the best aspect of education's previous humanist mission – to promote justice – but extend it beyond an exclusively human or social framework
2. **By 2050, we have fully acknowledged that humans are embedded within ecosystems and that we are ecological, not just social, beings. We have dissolved the boundaries between the "natural" and "social" sciences, and all curricula and pedagogies are now firmly grounded in an ecological consciousness**
3. **By 2050, we have stopped using education as a vehicle for promulgating human exceptionalism. We are teaching that agency is relational, collectively distributed, and more-than-human**
4. By 2050, we have discarded education's human development/al frameworks. Instead of championing individualism, we now foster collective dispositions and convivial, reparative human and more-than-human relations
5. **By 2050, we have recognized that we live and learn in a world. Our pedagogies no longer position the world "out-there" as the object we are learning about. Learning to become with the world is a situated practice and a more-than-human pedagogical collaboration**
6. By 2050, we have re-tasked education with a cosmopolitical remit. This has moved it far beyond the universalist and anthropocentric claims of humanist, humanitarian, and human rights perspectives
7. By 2050, the goal of education for future survival has led us to prioritize an ethics of collective recuperation on this damaged Earth

Any attempt to recognize that "humans are embedded within ecosystems and that we are ecological, not just social, beings" (point 2 Table 3) must embrace an ecological "world view." Du Plessis and Brandon (2015, pp. 55–56) suggest that three main narratives underlie the ecological world view. The first is the need to consider the earth as a whole – an interdependent and interconnected living system in which humans are an integral part of nature and partners in the processes of co-creation and co-evolution.

> Humans, their social structures, and their biophysical environment, form one integrated social-ecological system in which humans and their artefacts are an indivisible part of the biosphere and they, like any other organism, participate in and co-create the metabolic and change processes that shape the biosphere. However, the addition of the human mind introduces properties of self-reflection and symbolic thought that allows the intentional creation of novelty and the ability to direct change within the system (ibid, p. 55)

The second narrative is that the ecological worldview is first and foremost a relational view.

> Implied in 'ecological' is an understanding that we are dealing with living systems and all that comes with such systems, including connections, flows, relationships, interdependence, evolution and consciousness. The ecological worldview sees the phenomenal world as constantly regenerated through interactions within systems at all scales and levels of existence (physical, intellectual, emotional, social and spiritual). These interactions result in and from flows of matter, energy, information and influence, as well as processes of adaptation and self-organisation, which in turn allow these systems to evolve. In this world, phenomena do not exist independently, but come into being through different types of relationship and the processes they provoke. (ibid, p. 56)

The third narrative in the ecological world view is the world is dynamic, ever-changing, emergent, and therefore continually in a state of formation.

> Because of the inherent complexity and non-linear dynamics found in the systems that constitute the world, the world is not only impermanent and ever-changing, but also largely uncertain and unpredictable. In addition, our knowledge of the world is uncertain, constantly changing and relative to the viewpoint of the observer. Thus, accurate prediction and certainty are elusive goals at best. In such a world it is necessary to be able to respond and adapt to perturbations and fluctuations (ibid, p. 56)

Encouraging people to develop an ecological world view makes it easier for them to appreciate that learning and related practices are ecological phenomenon brought about by our unique interactions and relationships with the world, in which wholeness, relationships, and continual formation (creation) are a feature of a thriving individual and society (Du Plessis and Brandon 2015). It would also encourage us *to see ourselves as ecological interbeings* (Hanh 1992) living and interacting with and within an ecological world (UNESCO 2020b). Fundamental to achieving this perceptual shift is understanding that the way we interact with the world and the learning that emerges from such interactions are themselves ecological phenomenon.

Ecologies for Learning and Practice

Learning that is oriented toward creating sustainable futures is achieved through experiences of doing and experiencing the effects of our doings. It's an experiential phenomenon. Dewey explains that this is always a dynamic two-way process, "An experience is always what it is because of a transaction taking place between the individual and, what at the time, constitutes the environment" (Dewey 1938, p. 43). "When we experience something we act upon it, we do something; then we suffer or undergo the consequences. We do something to the thing and then it does something to us in return" (Dewey 1916, p. 104).

Dewey elaborates on this two-way process, suggesting that experience involves both "trying" and "undergoing" (Dewey 1916, p. 104). "Trying" refers to the outward expression of intention or action. It is the purposeful engagement of the individual with their environment or in Dewey's words, "doing becomes trying; an experiment with the world to find out what it is like." Through action an attempt is made to have an impact on the world. "Undergoing," the other aspect of the "transaction" in experience, refers to the consequences of experience on the individual. In turn, in attempting to have an impact, the experience also impacts on us. "Undergoing" refers to the consequences of the experience for us (Ord 2012, p. 60). A visual representation of John Dewey's transactional/interactional model of human experience is shown in Fig. 3.

This transactional view of experience involving people situated in and interacting with their environment, using resources and modifying their environment and the things and people in it, provides the foundation for the ecological perspective on learning and action.
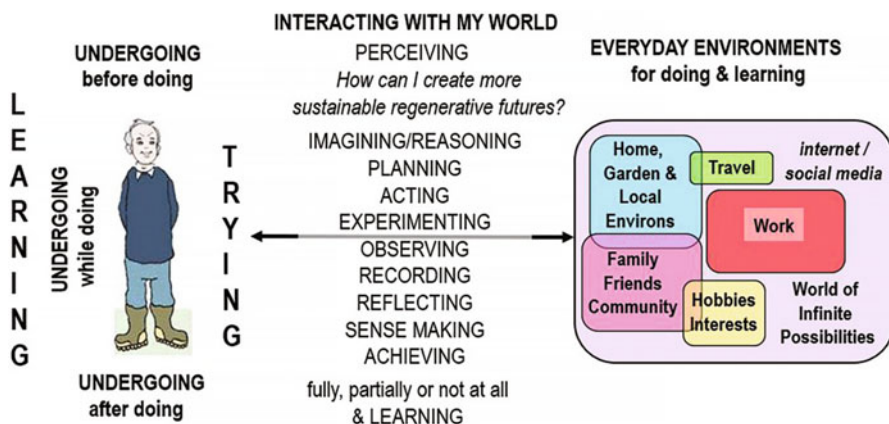
Fig. 3 Representation of Dewey's interactional model of experience in which the individual perceives and interacts with their everyday world. Learning, creativity and other achievements emerge through this interactive process (Dewey 1934). I use myself as the subject and the world that has meaning to me

> The very essence of life itself constitutes an unfolding personal ecology or, more accurately, a multiplicity of overlapping and intermingling ecologies that prompt challenge, disjunction, creativity, and development. The act of learning is an ecological phenomenon that brings forth new meanings and understandings of the world and of one's own being and identity in and with the world. The very act transforms us and the world around us. (Jackson and Barnett 2020, p. 1)

Learning and meaning emerge as we interact with our environment: there can be no learning or meaning without an environment or reason to act.

> A properly ecological approach ... is one that would take, as its point of departure, the whole-organism-in-its-environment. In other words, 'organism plus environment' should denote not a compound of two things, but one indivisible totality. That totality is, in effect, a developmental system . . .and an ecology of life . . . is one that would deal with the dynamics of such systems. (Ingold 2000, p. 16)

When a person encounters a new challenge or opportunity, they attempt to comprehend the situation and act in appropriate ways. Effectively, the person creates an ecology – a related and interdependent set of responses, processes, structures, tools and other resources, and agency that enables them to "practise" – to relate to, perceive, and interact with their environment in order to understand it, and perform and achieve in it, usually with an intention in mind. A learning ecology is an ecology of practice in which the primary purpose is learning. Jackson (2016, 2020a, b) developed a model of a learning ecology and Fig. 4 attempts to synthesize the elements it contains.

The model embraces all three themes in the ecological world view – wholeness, relationships, and continual formation. It *relates* a *whole* thinking, feeling, acting,
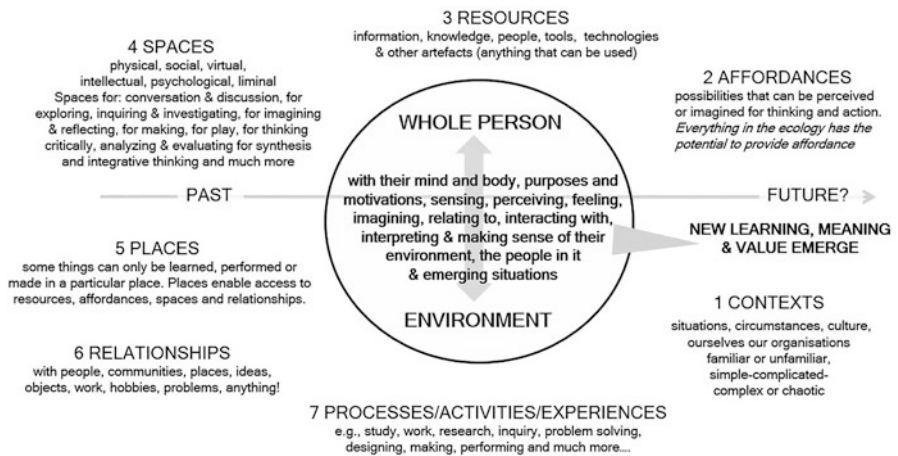
Fig. 4 Generic model of a learning ecology or an ecology for practice within which learning is embedded (source Jackson 2016, 2020a). The labels (1–7) explain the key dimensions of the ecology

caring person to their environment, contexts, needs, interests, desires, and what they are trying to achieve in the particular situations in which they are acting. Learning and achievement (*development/new agency/change*) emerge through meaningful interaction. The same framework can be used to characterize any complex practice where learning is intended or necessary to achieve desirable outcomes.
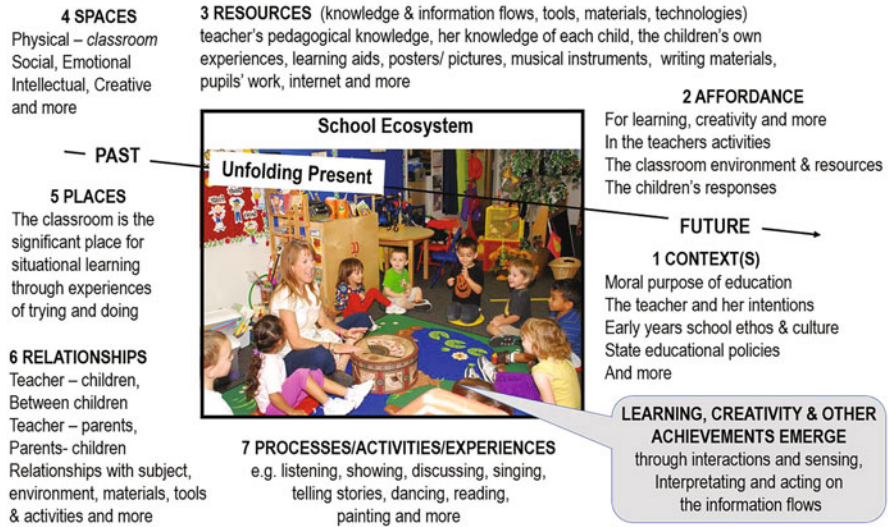
Another expression of wholeness and relatedness is the way that ecologies for learning and practice have both temporal and spatial dimensions. They enable whole people to connect and integrate different spaces, resources, tools, situations, relationships, activities, and themselves in ways that they find meaningful and effect various transformations (personal, social, material, and virtual). They also enable people to connect and integrate their past, present, and future, and connect thoughts and actions experienced in a moment and organize and integrate them into more significant experiences of thinking and action. They are the means by which people weave their moments into the fabric of a whole meaningful life, a life they feel is worth living. The components of an ecology for learning, summarized in Fig. 4, are woven together by the maker in a part deliberate, part opportunistic act of trying to achieve something and learning how to do it in the process. This is the origin of our unique creativity and the generative force that humans bring to bear on the world they co-create.

A Teacher's Ecology of Practice

To illustrate the workings of an ecology of practice we might observe a teacher in her classroom with children joyfully immersed in generative activity for the purpose of learning (Fig. 5). The teacher is the agent for the children's undergoing and she achieves this through the ways in which she engages them in purposeful and meaningful activity and interacts with them as they interpret and respond to their environment. Without being conscious of the ecology of practice outlined above, she creates her own regenerative culture by skillfully relating and weaving together, in a part deliberate, part opportunistic way, herself, her pupils, and other elements she carefully selects from her environment. There is no better illustration of the human generative force in action and her efforts are directed to developing the generative capacities of learners who will deploy their capabilities in the future.

The teacher's ecology of practice has a past – her own life experiences and particularly those experiences that have enabled her to undergo and become a teacher. The knowledge and skills she brings to the situation are the result of her past undergoing. Furthermore, prior to entering the situation she will have planned the activities and anticipated their effects, i.e., she will have "undergone" in a more specific way.

Her ecology of practice has a present as it unfolds in her classroom as she causes or interacts with each new situation. In her near future she is likely to reflect on her experiences and learn from them. And in her more distant future she will draw on the experience and what she learns as she plans new actions.

4 SPACES
Physical – *classroom*
Social, Emotional
Intellectual, Creative
and more

3 RESOURCES (knowledge & information flows, tools, materials, technologies)
teacher's pedagogical knowledge, her knowledge of each child, the children's own
experiences, learning aids, posters/ pictures, musical instruments, writing materials,
pupils' work, internet and more

2 AFFORDANCE
For learning, creativity and more
In the teachers activities
The classroom environment & resources
The children's responses

— PAST —

School Ecosystem

Unfolding Present

5 PLACES
The classroom is the
significant place for
situational learning
through experiences
of trying and doing

FUTURE —

1 CONTEXT(S)
Moral purpose of education
The teacher and her intentions
Early years school ethos & culture
State educational policies
And more

6 RELATIONSHIPS
Teacher – children,
Between children
Teacher – parents,
Parents- children
Relationships with subject,
environment, materials, tools
& activities and more

7 PROCESSES/ACTIVITIES/EXPERIENCES
e.g. listening, showing, discussing, singing,
telling stories, dancing, reading,
painting and more

**LEARNING, CREATIVITY & OTHER
ACHIEVEMENTS EMERGE**
through interactions and sensing,
Interpretating and acting on
the information flows

Fig. 5 Applying the model of an ecology for practice within which learning is embedded to a teacher engaging her pupils in her classroom for the purpose of learning

The teacher's thinking and actions are shaped by many things. She is embedded in a number of contexts, for example, her own professional life, the ethos and culture of the school, the various policies that affect what and how she teaches and the particular educational context of what she is trying to achieve.

As she takes in the information flows from her environment through her senses, she can perceive affordances – opportunities for action as the children participate in the activities she has created. There are abundant resources in this environment to stimulate and support learning but the most important resource is the teacher and the children. The classroom is a special place for learning in a school that is also a special place for learning: the children expect to learn when they come to this place. The teacher and children inhabit a physical space but the teacher also creates cognitive, psychological, emotional, and playful spaces for interaction and learning. Everyone and everything in this environment is related and these relationships are used and developed through the particular activities and interactions that are orchestrated and facilitated by the teacher in order to promote learning.

Using her knowledge, skill, and imagination, the teacher creates the ecology for learning and associated generative culture that encourages and supports learning, but every child who participates is also involved in its co-creation. But the teacher only comes to understand the effects of her ecology as it unfolds, so she monitors her effects and adjusts her actions where appropriate. Through her actions and the tools she uses, she extends her mind and body into this environment and through her actions and the feedback she receives she becomes indivisible with it, "one indivisible totality. That totality is, in effect, a developmental system . . .and an ecology of life" (Ingold 2000, p. 16). Her ecology of practice and the experiences that emerge,

enable both the teacher and the children to learn and change – they "undergo" together.

This model of an ecology of practice within which learning is embedded, can be applied to any complex practice (Jackson 2020a). It reveals the very nature of our interbeing (Hanh 1992) and the ways in which our learning, our creativity, and other developmental phenomenon emerge through purposeful interactions in and with our environment. It helps us appreciate that we and our environment are one indivisible entity (Ingold 2000) in the manner so wonderfully described by Thomas Berry (1992, p. 34).

> The idea that we live in something called 'the environment' . . . is utterly preposterous. . . .'Environment' means that which surrounds or encircles us; it means a world separate from ourselves, outside us. . . . The real state of things, of course, is far more complex and intimate and interesting than that. The world that environs us, that is around us, is also within us. We are made of it; we eat, drink, and breathe it.

This appreciation of that we live with and through our environment is an important concept to grasp if we are to develop an enhanced concept of lifelong-lifewide learning for sustainable regenerative futures.

Conclusions

Children of today will live well into the next century. What they learn today, and particularly the attitudes they develop to learning across and throughout their lives, will provide the foundation for 100 years or more of learning to adapt to, and thrive in, a world whose characteristics we cannot imagine. Education in a formal sense needs to be fully integrated into concepts of learning, self-education, and collective-education across and throughout the lifespan. "A more holistic understanding of the concept of lifelong learning is needed – one which puts the innate capability to learn at the core and recognizes any learning activity throughout life as important" (UNESCO 2020b, p. 19). Two ideas are offered in this chapter for generating a more holistic understanding of lifelong learning, namely, making the lifewide dimension of lifelong learning explicit and recognizing learning itself, in all its manifestations and contexts, as an ecological phenomenon.

The actions we undertake in the present satisfy our needs in the present, but they also have consequences for the future and there is no escaping the science that tells us that the way we are behaving in the present will create a future that is unsustainable for our species and many other forms of life. We have reached a point in human history where the moral purpose of education and individuals' commitment to learning throughout their life, needs to be broadened to encompass the health and vitality of the planet and the life it supports. As humanity is the living conscious expression of a world in continuous formation, we have a moral responsibility to embrace what Berry (1988) calls the new Ecological Age and actively participate in the next "Great Work" for humanity (Berry 1999), namely, the

construction of an ecological civilization (Lent 2021). Underlying this essay is the belief that understanding learning as an ecological phenomenon is an important stepping stone to this imagined future.

The UNESCO vision for a sustainable future in which we "learn for oneself, for others and for the planet" (UNESCO 2020b, p. 14) highlights the essential role of individual's lifelong learning to achieving a future that is sustainable and regenerative. However, in order to achieve this cultural shift lifewide learning should be explicitly recognized within the overall paradigm of lifelong learning. This dimension of learning contains the everyday activities within which people impact their environment for better or worse and are able to learn to adjust their behaviors, drawing on their own imaginations and creativity to contribute to more sustainable and regenerative futures.

Individually and collectively we need to learn how to participate in and with our environment in a way that minimizes damage and optimizes affordance for a sustainable regenerative future (Reed 2007, p. 674). To achieve this cultural shift, educational thought leaders, policy makers, and practitioners must embrace an ecological world view within which learning, along with all other human activities and phenomenon, can be understood as ecological phenomenon. The model of an ecology for practice offered in this chapter (Fig. 4), attempts to show that we are fundamentally interbeings – thinking and acting in an ecological – relational and interdependent manner with the world around us. Such interactions and relationships connect us physically, cognitively, emotionally, and spiritually to the living and nonliving things in our environment and enable our imagination and creativity to perceive new affordances and generate new possibilities. The adoption of a lifewide approach to education, together with an ecological concept of learning, is essential to laying the foundations for an enhanced concept of lifelong learning for an ecological civilization committed to sustainable regenerative futures.

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