



WEEC2017 RESEARCH SYMPOSIUM  
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This first full day research symposium at the **World Environmental Education Congress** adopts a 'critical conversation' format to focus on questions of strategy and priority for the field of environmental education.

Using participatory session formats, it provides a range of insights and dialogue opportunities about the field, including its challenges, dilemmas and priorities in terms of *what environmental education is, what it could be, and might or must become.*

The first half of the day focuses on ***trajectories of environmental education***, through presentations and discussion that probe why the field of environmental education has become what it is, and where might it be heading.

The second half of the day will focus on ***priorities for environmental education***, through presentations and discussion that probe how to increase the contributions of research, policy, and strategy in advancing environmental education.

Short, pithy and provocative position papers from our invited speakers are being pre-circulated on our themes in this document.

The first two papers will be discussed in the first half of the day, the final two papers will be discussed in the second half.

*Please read these papers before the event, and be prepared to discuss them with their authors and other event participants.*

We would like to thank David Zandvliet, WEEC2017 Program Chair, for arranging our venue, the Morris J Wosk Centre for Dialogue, and our presenters for their good will, vision, and contributions to this inaugural research symposium at the Congress.

We look forward to your participation and dialogue!

The image shows two handwritten signatures in black ink. The signature on the left is 'A. Reid' and the signature on the right is 'MKenzie'.

**Alan Reid** and **Marcia McKenzie** (convenors)

**Cover Image © Monash University | Casey Hawkin**

# **Environmental education: paradox and proposition**

Stephen Sterling, *University of Plymouth*

The reflections and propositions in this paper are based on my immersion in the field of environmental and sustainability education for the past 40+ years.

These are ten propositions, which I hope will stimulate debate.

## **1) Environmental education has been unable to articulate and grow a rigorous and persuasive counter and alternative to dominant educational paradigms and practices**

It has been exactly 40 years since the UNESCO Intergovernmental Conference on Environmental Education at Tbilisi, USSR (1977) which can be seen as the key international launch platform for Environmental Education (EE), following the seminal Belgrade Charter of 1975. These meetings laid down a remarkably bold and holistic vision, albeit still focussed on ‘the environment’ as such, and were subsequently deeply influential as regards defining the field and lending status and momentum to its take-up. The decades since constitute a relatively short time for a movement or idea to have lasting global impact, particularly in educational systems, but its wide acceptance (if not always its implementation) appears solid, not least with current recognition of the role of education in achieving the Sustainable Development Goals (SDGs).

On the other hand, the ambitious Tbilisi goals to ‘provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment’ and to ‘develop and reinforce new patterns of environmentally sensitive behaviour amongst individuals, groups and society as a whole towards the environment’ unsurprisingly perhaps, remain years later as unfulfilled ideals. In 1975, the global ecological footprint was about 0.8 Earths, today it is 1.6 Earths – we are in a position of mounting ecological debt.

## **2) Whilst environmental education is evolving, its course is not one of continuous development and progress**

There tends to be an assumption—allied perhaps to the modernist myth of progress—that environmental education must inevitably be improving, developing greater insight, reaching more people, being more effective over time. This is partly justified. But my recent experience of going through the archives of the (now defunct) *Council for Environmental Education* in the UK persuaded me that many key ideas, values and issues of clarity and implementation that were articulated many years ago still ring true. We should be wary therefore of poorly-considered calls for ‘new thinking’ in environmental education, or more boldly, a ‘new vision for education’ where they overlook the building blocks of earlier insights and experience.

## **3) The term ‘Environmental Education’ both illuminates and obfuscates**

The term is necessary to communicate in shorthand a field of ideas, values, and practices. But all these years later, the majority of educators either have

little or no idea of what it means, its history, and its implications. This picture is complicated by the emergence of a raft of related and alternative terms over the past 30 or so years.

#### **4) The term ‘Environmental Education’ implies boundaries: which are useful in practice, but also exclusive**

Any term and definition suggests boundaries regarding what lies within its ambit, and what appears to lie without. So whilst ‘Environmental Education’ implies a set of ideas, values, and practices which has achieved a working consensus over the years, the field has nevertheless long reflected an ambiguity. On the one hand, the emergence of language and assumptions that define environmental education allow its practitioners to exchange ideas and develop the field within its parameters; yet at the same time, there is a persistent and persuasive notion that ‘*all* education is environmental education’ (or argument that it should be).<sup>1</sup>

This ambiguity is reflected in UNESCO documents. UNESCO remains the key player in legitimating the field, and although their preferred term is ‘education for sustainable development’ (ESD), they appear caught between asserting the integrity of ESD as such, and advocating the need for a ‘new vision of education’ as a whole (see UNESCO 2015; Bokova 2016).

At the same time, the understandable desire and tendency within the EE/ESD field to maintain identity and coherence has militated against more

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<sup>1</sup> The first mention of this I have come across is in Mark Terry (1971) *Teaching for Survival*, Ballantine Books (a book which was partly responsible for me becoming involved in environmental education). It was later echoed by David Orr in *Earth in Mind* (1994).

constructive interchange between the education community/discourse, and the sustainable development community/discourse (Sterling 2014). It took until 2016 for UNESCO to focus its annual authoritative Global Education Monitoring report (GEM) (UNESCO 2016) on the necessary relationship between education and building a more sustainable economy and society.

**5) The history of environmental education is one both of expansion and integration on one hand, and fragmentation and autonomy on the other**

If we track the emergence of this field, say from the local studies, rural studies, and environmental studies traditions of the 1940s (in the UK at least), there has been a trajectory of gradual inclusivity. The emphasis on the natural world and conservation was complemented by urban studies and a more political dimension in the 1970s, and from there a growing dialogue between environmental and development education was compounded from the time of the 1992 Rio Earth Summit onwards with the advent of 'education for sustainable development'. Yet while the bandwidth of the field stretched outwards, a jostling of identity and ownership led to contestation and a degree of retrenchment – made more complicated by the emergence of a range of 'adjectival educations' such as peace education, human rights education, anti-racist education, gender education, futures education, global education, and education for global citizenship, whilst other alternative labels such as 'education for a sustainable future' and 'sustainability education' all became part of the mix (see Sterling 2004). The latest Worldwatch report (Assadourian 2017), interestingly, goes for '**EarthEd**'.



We are now in a state of *bricolage* - which has obvious strengths and weaknesses.

#### **6) Environmental education can both reinforce dualism and counter it**

A very experienced Scandinavian educator wrote to me recently saying he didn't like the term 'environmental education' as the label itself tended to reinforce the idea of an environment separate from, or apart from people. This touches on an issue of momentous importance which concerns epistemology and ontology. The term 'the environment' is meaningful and useful in everyday employment, but it tends perpetuate the sense of dissociation, of the duality of people and environment. Gregory Bateson (1972) perhaps expressed this most powerfully in his notion of the 'epistemological error'—our perception of separateness—at the heart of the Western worldview and psyche. Bateson's insight mounts a radical challenge to the individualism, egotism, anthropocentrism and dualism which still prevails in Western and westernised cultures. At the same time, immersive environmental education—an encounter with the Other—can genuinely offer a transformative experiential sense of connection and even communion.

#### **7) Environmental Education discourse tends not to engage with deeper issues of Western culture and worldview—that render environmental education necessary as a remedial practice**

The main tension within environmental education, and particularly between EE and ESD, over the last 20 or so years has centred on *instrumentalism* versus *developmentalism*: either seeing education primarily as a means through

which pressing environment/sustainability issues can be addressed or ameliorated, or alternatively, seeing the quality of education and learning as the prime focus, with any change in behaviour or affect on social and environmental issues as a possible but not prescribed outcome. This has been a major fault-line, but with mounting evidence of global crises, plus increasing interest in transformative learning through experience, it might be safe to say the assumed conflict here is giving way to recognition of a necessary convergence and complementarity between these perspectives.

However, on the whole, environmental education has been more remedial than explorative with regard to the root causes of our culture's ability and tendency to engender so many systemic problems globally. Wilber's 'integral quadrant model' (**Figure 1**) of human knowledge and experience provides a helpful framework to appreciate the strengths and relative weaknesses of environmental education as it has been articulated and practised to date.

Environmental education has tended to concentrate on the individual rather than the collective, and the exterior (behaviour and systems) rather than the interior domain. In a nutshell, the bottom-left of Wilber's quadrant—the intersubjective domain of collective culture, worldview, belief and paradigm—has tended to be overlooked or underplayed in environmental education discourse, and also by influential bodies such as UNESCO. I would argue however that it is our collective dysfunctionality in this domain that makes environmental education necessary in the first place.



Figure 1: Wilber's quadrant model <sup>2</sup>

<sup>2</sup> Source: <http://personalityjunkie.com/wp-content/uploads/2012/05/wilber-quadrants-2.gif>

**8) Environmental education has been unable to articulate and grow a rigorous a persuasive counter and alternative to dominant educational paradigms and practices**

Environmental education has mounted a healthy critical debate over the years on the shortcomings of mainstream educational thinking, whether to do with excessive competition, specialism, transmissive pedagogies, narrow vocationalism, and more latterly the effects of neo-liberal thinking and policy-making. But perhaps because of its focus other than the cultural domain, (as noted above) Environmental Education has been poor at articulating a robustly different educational paradigm which would both give more depth to its critique and challenge, and substance to its ability to grow more ecological, holistic and humanistic alternatives. Also, and to some extent, this problem has enabled radical environmental education movements to be accommodated and neutered by the mainstream.

**9) After 40 years, environmental education should be confident enough to engage broadly and to drop the label 'Environmental Education' whenever it is advantageous to do so**

Perhaps the label doesn't matter as much as it did forty years ago when this seedling was struggling for life and recognition. Despite on-going issues, the environmental education movement should strive to encourage, welcome and interact with any education for change movement that affects environmental quality and social justice positively, irrespective of what it might call itself.

**10) The real business is not the protection or advancement of the field of environmental education but any strategy that can help shift consciousness and build positive pathways and action in this watershed moment in history**

There have been and are numerous calls for humanity, and particularly economic development patterns, to change course radically whilst the diminishing window of time still allows such change—squeezed by climate change, species loss, inequity within and between countries, resource scarcity, population pressures, global conflict and so on. The UN, launching the SDGs in 2015 notes with urgency that, ‘The survival of many societies, and of the biological support systems of the planet, is at risk’ (UN 2015, p.5).

The theologian and environmentalist Thomas Berry (2000, 3) writes of ‘the Great Work’, which he says is carrying out ‘out the transition from a period of human devastation of the Earth to a period when humans would be present to the planet in a mutually beneficial manner’.

This is immensely challenging—yet immensely necessary. Exactly 30 years ago, the Brundtland Report—seminal to the sustainable development movement—called for ‘vast campaigns of education, debate, and public participation’ (WCED 1986, xiv). It didn’t quite happen as intended, although undoubtedly the game changed in the wake of Brundtland. Now, the new Worldwatch State of the World report calls for ‘education reform on a planetary scale’, but the language still tends to be ‘what it would/could/should be like’.

So we are still ‘not there’ yet, and need to greatly accelerate educational change across formal and non-formal sectors, commensurate with the magnitude of the global challenges we face. This would involve environmental education being much more strongly and actively aligned to the ‘Great Work’, that is, to transition and well-being movements, to growing progressive and reconstructive movements in civil society, to bold futures research and redesign initiatives, and many other manifestations of life-affirming shifts and social learning, labelled as ‘blessed unrest’ by Hawken (2008).

This is anticipative learning, or learning by design, and is both necessary and wise. The alternative is learning by default—risking having to learn survival skills in conditions of volatility rather than having the capacity to build more sustainable communities. Forty years on from Tbilisi, time is short.

### **Summary of propositions**

- 1) Environmental education has been unable to articulate and grow a rigorous and persuasive counter and alternative to dominant educational paradigms and practices.
- 2) Whilst environmental education is evolving, its course is not one of continuous development and progress.
- 3) The term 'Environmental Education' both illuminates and obfuscates.
- 4) The term 'Environmental Education' implies boundaries: which are useful in practice, but also exclusive.
- 5) The history of environmental education is one both of expansion and integration on one hand, and fragmentation and autonomy on the other.
- 6) Environmental education can both reinforce dualism and counter it.
- 7) Environmental Education discourse tends not to engage with deeper issues of Western culture and worldview—that render environmental education necessary as a remedial practice.
- 8) Environmental education has been unable to articulate and grow a rigorous a persuasive counter and alternative to dominant educational paradigms and practices.
- 9) After 40 years, environmental education should be confident enough to engage broadly and to drop the label 'Environmental Education' whenever it is advantageous to do so.
- 10) The real business is not the protection or advancement of the field of environmental education but any strategy that can help shift consciousness and build positive pathways and action in this watershed moment in history.

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# **Environmental education: hyper-complexity, diversity, and moving trends**

Lucie Sauvé, *Université du Québec à Montréal*

In this short paper, I propose some fragments of responses to the questions *What has environmental education become?* and *Which avenues could be further explored in the current socio-ecological context?*

## **Mapping environmental education**

It seems that the expression “environment related education” (*education relative à l’environnement* in French) affords better coverage of the broad scope of this core educational dimension as it has unfolded in recent decades. Each of these three words opens a whole phenomenological world, reflecting the hyper-complexity and diversity of the field.

*Environment* is conceived for example, as *nature* (to protect and celebrate) or as a *system* (to understand), a *set of resources* (to manage), a *web of problems* (to solve), the *whole biosphere* (to consider globally), a *territory*, *place* or *milieu* (to inhabit), a “*common good*” (for collective governance), etc. Environment is either seen as an *object* out there, as a *matrix* we are part of (as in indigenous cultures), or as an *action project* to get involved in, be that in community, urban, rural, school, industrial or any other context.

*Education* may be associated with information, communication, interpretation, instruction, literacy, awareness, consciousness-raising, training, learning, advocacy, mobilization, transformation ...

And the diverse ways these two poles—education *and* environment—can be *related* add to this complexity, as in the classical typology of education *about*, *in*, *with* and *for* the environment ... a complexity that is further compounded by the diverse ontological, epistemological, cultural, ethical, methodological, strategical, pedagogical or political frameworks than can be adopted to define and enact these relations.

Mapping the whole “continent” of environmental education (EE) then, and relating it to other educational “regions” (like health or peace or consumption educations) and other environmental spheres of study and action (for example, ecodevelopment, agroecology, transition initiatives, eco-art, eco-design, etc.) is a huge and ever uncompleted task, given the evolving dynamics of these fields. This diversity is closely associated with the richness and resilience of the field (a well-known ecological principle!). For example, since its institutional recognition and promotion from UNESCO in 1975, the scale, depth, and diversity of how environmental education has been deployed has followed societal, political and educational trends, echoing a range of mainstream or marginal waves of influence.

Nevertheless, attempts to enclose environmental education in an ideological straitjacket—like that of sustainable development—have failed to constrain its deployment. Through interactions between its actors, the global field of environmental education has been a living arena of societal and educational criticism, and has displayed a critical awareness of itself (as in Jickling and

Sterling 2017). Yet it still remains in search of a comprehensive, well-affirmed and recognized identity, with and beyond the words that name it and whose semantics always remain problematical.

Correspondingly, environmental education has yet to adequately penetrate educational, environmental and social policies—despite its trajectory of more than 40 years, and despite the fact that the work to be carried out remains titanic. Among other problems, its integration into curricula is still very timid, teacher education is inadequate for this purpose, and NGO funding—which has so far assumed a major role in EE—has become scarce.

But rather than get mired in perceived failures, we should celebrate courageous journeys, the involvement and creativity of environmental educators, and take inspiration from it all, using these as stepping stones.

EE actors have multiplied and diversified,  
research and practice networks have been  
structured at local, regional and international levels,  
expertise has been deployed in so many different contexts  
while productions, projects and outputs in the field flood the web  
and could fill a huge library.

In fact, up to now, multifaceted EE initiatives have helped mitigate the effects of the dominant capitalist and individualist culture by working—reactively, proactively or creatively—towards the resolution of environmental problems, along with resource management or ecological transition, for example.

While beyond the often-shallow approaches of prevention and resilience, environmental education has contributed to the rising of a deep cultural wave, the emergence of an alternative societal paradigm.

Revisiting the trajectory of environmental education's advances and achievements—while completing the cartography of its diversified territory in different cultural spheres—could help fuel the impetus in pursuing this work, and strengthen our advocacy for the formal recognition of EE as a core educational project, which urgently needs to be widely supported.

As a contribution to mapping the huge landscape of environmental education, in 2005, I have identified and characterized fifteen theoretical and pedagogical currents as they were found in writings, discourses and practices (**Table 1**). This descriptive research is ongoing so as to include more recent trends (as in the fields of eco-art and design, transition movements, or ecological activism), to reshape the initial typology and extend this “observatory” to different cultural spheres.

**Table 1: Fifteen currents in environmental education** (Source: Sauvé 2005)

Among those currents with a longer tradition in EE:	Among those currents more recently emerged in EE:
1. Naturalist Current	8. Holistic Current
2. Conservationist/Resourcist Current	9. Bioregionalist Current
3. Problem-Solving Current	10. Praxic Current
4. Systemic Current	11. Socially Critical Current
5. Scientific Current	12. Feminist Current
6. Humanist/Mesological Current	13. Ethnographic Current
7. Value-centered Current	14. Eco-Education Current
	15. Sustainable Development/Sustainability Current

### **Building on heritage: Some further avenues**

1. Revisiting this typology, it seems that, well beyond an initial pragmatic environmentalism (often related with currents 2, 3, 4, 5), one of the strong trends in environmental education is that of the ever-renewed and deepened ecological paradigm that anchors our humanity within *oikos*.

Oikos signals a unique home which we all share, between us as humans and with all other life forms (as in ecophychology, ecoformation, ecopedagogy and other fields that could be related to currents 8, 11, 12, 13, 14). I

nspired by its naturalistic roots, ecology is now a well-grounded philosophical and political field aiming at reconnecting society and nature, and allowing us to better grasp the realities associated with, for example, environmental justice or socioecological equity.

Thus, drawing upon the concept of *ecological education* appears to be particularly relevant when attempting to explicate the aim of environmental education:

it focuses on our human relation with eco-social realities;

it opens towards an hermeneutical and ethical process that helps us clarify and even transcend the current dominant value of sustainability—as a side outcome of the politico-economic program of sustainable development.

2. In line with this ecological framework, it appears that the complex dynamics related to *identity* and *commitment*, and the close relations between these individual and collective psycho-social realities, raises important contemporary challenges for environmental education.

Working on the issue of *identity*—on personal and social crossed identities—is crucial in this moving and troubled world, where belonging benchmarks either fade or may be exacerbated.

This task is even more important considering that the various forms of our *commitment* in this world—cognitive, creative, artistic, spiritual, political, and others—are rooted in the diverse dimensions of our identities, and retroactively contribute to shape them.

Involvement remains a core issue in environmental education, especially when recognizing the intricate links between interiority (identity) and exteriority (commitment).

These questions need to be revisited in light of the current societal context (as in Berryman 2017, or Naoufal 2017). Here, the field of *ecological identity* becomes increasingly relevant to recognising our common insertion within the weave of life which we are part of. Mitchell Tomashow (1995) invites a more precise examination of the political dimension of our ecological identity, which refers to

our way of involving ourselves in collective affairs and power dynamics,

our way of conceiving our own action competence,

our areas and modes of commitment.

3. The more recently developed concept of ecocitizenship dwells on this political dimension of ecological identity. Here, the “city” widens to the whole living world, broadening the scope of citizenship education and insisting upon the collective dimension of our relationships with and within the environment.

Ecocitizenship education, as an ecopolitical education (Sauvé 2015), invites a commitment to collective action projects aiming at the transformation of eco-social realities as well as our own transformation (Sauvé 2014).

Learning in reflexive action is more than ever crucial in these times in which activism can be defined in contrast with passivity, and appears as an issue of high relevance in the current societal context, as a core ethical issue.

Centered on the complex relationship between identity and commitment, ecocitizenship education could offer a relevant and inspiring reference framework for further development in environmental education, so as to address the ever huge challenge of *being here together* (Sauvé 2009).

#### **A remaining major issue: advocating for environmental education**

The deployment of diverse currents in environmental education throughout recent years affords explorations of the depth and scope of this educational sphere. Environmental education is not simply a thematic education added to all the other ones. It concerns one of the three essential spheres of human development, all of which are closely intricate:

in-line with our relationship with the self (the sphere of identity construction)

and our relationship with others (the sphere of human alterity),

environmental education dwells on the sphere of our relations with *oikos*, our shared home, that opens to ecological alterity.

Environmental education carries an *ontogenetic* function (constructing our being-in-the-world), as well as *epistemological, aesthetic, critical, ethical, political, and heuristic* functions (reinventing the world). Without integrating this third sphere of interactions at the basis of personal and social development (as is, unfortunately, so often the case), education is truncated and we remain incomplete beings.

Through research and practice in various contexts, actors of the diverse field of environmental education have come to understand that they must constantly search for recognition of the necessity of such an educational project. In the current societal context of global economization and individualization, we must work to convince decision-makers in diverse fields of activity (education, environment, agriculture, natural resources, health, social services, culture, etc.) of the need to offer adequate formal support—without ideological limitations or otherwise alienating constraints—and provide the necessary resources in order to accelerate the deployment of environmental education, building on the rich diversity of its complementary currents, and convening all actors of our educational society to contribute to this core project. In this perspective, the influential international programs (from UN, UNESCO, OECD) would need to be revisited so as to enlarge the scope of their educational proposals (or prescriptions) and take adequate account of the fundamental ecological dimension to our human journey (Lotz-Sisitka 2017; Sauvé & Asselin 2017; Wals, Weakland & Corcoran 2017). The Anthropocene era not only pursues ecocide, but also could enable anthropocide: humans become objects of manipulations and various experimentations, while cultural homogenization restrains and constricts their relationships with the world. Environmental education, conceived as ecological education, becomes essential for envisioning a future Ecocene.



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# Monitoring Education for Sustainable Development and Global Citizenship in the New Education Agenda

Aaron Benavot, *University at Albany, SUNY* & Nihan Koseleci, *Unesco* <sup>3</sup>

## Background

In the two years since the adoption of the 2030 Agenda for Sustainable Development, UN member states have agreed on an elaborate global indicator framework (6 July 2017). This framework establishes clear links between each of the 169 SDG targets and specific global indicators to support national, regional and international reviews of progress in the coming years. That said, country obligations to measure the global indicators have been toned down: the new indicator framework is a “voluntary and country-led instrument” which mainly draws on national statistical systems with support from international agencies.

While many of the adopted global indicators have been extensively measured by international agencies over the years, others are newly defined, with exploratory measures being undertaken or with measures limited by country coverage or data comparability. Overall there is considerable variability in the status, history, political agreement and geographical coverage of the concrete

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<sup>3</sup> An expanded version of this paper is published in *SangSaeng*.

measurement of recently adopted global indicators. This is certainly true for Target 4.7.

### **Target 4.7 and the adopted global indicator**

Arguably target 4.7 <sup>4</sup>, which focuses on learning for sustainability and global citizenship, captures well the transformative aspirations of the new global development agenda. It touches on the social, humanistic, and moral purposes of education, and seeks greater alignment between national priorities and international commitments. If real progress in target 4.7 were to occur, this would likely have spillover effects in key areas of 2030 Agenda in the future.

Setting a global indicator for target 4.7 is no easy matter; there is no historical precedent. The currently formulated global indicator <sup>5</sup> focuses on inputs and (some) processes, but sidesteps the target's main intent of ensuring that all learners, young and old, acquire knowledge and skills aligned with the 2030 Agenda for sustainable development.

Before considering current efforts to measure the global indicator the authors believe that a broader discussion of measuring target 4.7 is needed: for

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<sup>4</sup> By 2030 ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development.

<sup>5</sup> Global indicator **4.7.1**: Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment.

*example, what kinds of country level measures would best capture the intent and language of target 4.7? Do such measures need to be internationally comparable or would country reports against a comprehensive template suffice? Will creating international measures of target 4.7 affect significant change in policy and practice? We will briefly return to these issues in the conclusion.*

#### **Description and critique of current measure of the global indicator for target 4.7**

UNESCO member states' reports on the implementation of the 1974 Recommendation concerning Education for International Understanding, Co-operation and Peace and Education relating to Human Rights and Fundamental Freedoms now constitutes the mechanism to monitor the global indicator for 4.7.

An analysis of 57 national reports submitted under the fifth consultation covering the period 2009-2012 sheds some light. The reports were coded using a protocol with a set of key terms. Over 85% of countries reported including human rights and fundamental freedoms in their education policy and curricula. On the other hand, education for sustainable development and cultural diversity and tolerance were less common. Only 65% of countries reported integrating education for sustainable development in policy and 33% in curriculum. In general, many terms that are common in curricula are not taken up in teacher education programmes.

The questionnaire was revised for the sixth consultation to include fewer open-ended and more multiple-choice questions as well as an online

reporting process. The 83 national reports received represented a 51% increase in the response rate since 2012. But low response rates and submission quality mean the process is weak and needs to be complemented by a more systematic and rigorous approach.

### **Other efforts to measure and monitor target 4.7**

**The 2016 Global Education Monitoring (GEM) Report** presented concrete analyses of curricular policies and textbooks related to target 4.7. It also discussed monitoring strategies of teacher education programs as well as surveys of learner knowledge, values and skills related to sustainability.

*Curricular policies:* To provide a global picture of the prevalence of content related to target 4.7 in national curricula the GEM Report team and UNESCO's International Bureau of Education reviewed over 110 national curriculum framework documents at the primary and secondary education level from 78 countries.<sup>6</sup> The national curriculum documents covering the period of 2005-2015 the documents were analysed with a special protocol to determine whether key Target 4.7 themes were included: human rights, gender equality, peace, non-violence and human security, sustainable development, and global citizenship.

Among 78 countries, 92 per cent included one or more key terms relating to human rights in their curricula with rights (89 per cent) and democracy (80 per cent) being the most prevalent ones. Countries also placed some emphasis

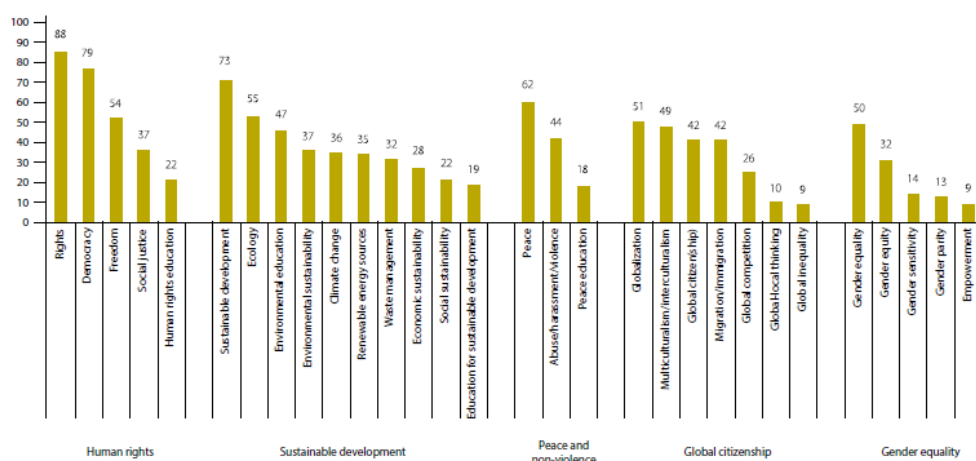
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<sup>6</sup> In the sample, there are 18 countries from Latin America and the Caribbean, 16 from Europe and Northern America, 15 from sub-Saharan Africa, 11 from the Pacific, 7 from Eastern and South-eastern Asia, 6 from Southern Asia, 3 from North Africa and Western Asia, and 2 from Caucasus and Central Asia.

on sustainable development issues. About three-quarters of the countries incorporated sustainable development and sustainability, but key terms like social and economic sustainability were present in less than one-third of countries' national curricula.

Gender equality appeared to be less highlighted in national curriculum frameworks. Less than 15 per cent of the countries integrated key terms such as gender empowerment, gender parity or gender-sensitiveness in their national curricula, and only 50 per cent of countries mentioned gender equality. Countries also make less reference to key terms related to global citizenship. Around 10 per cent of the countries included notions such as global inequalities or global thinking in their curricula, and globalisation, and multiculturalism and interculturalism were mentioned in half of the countries' national curricula (**Figure 1**).

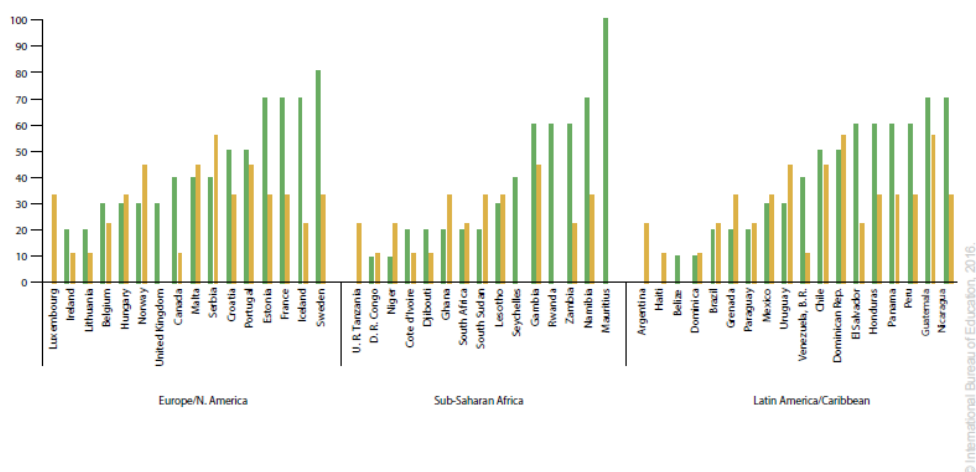
**Figure 1: Percentage of countries including each of the key terms in their national curriculum frameworks, 2005-2015 (Based on sample of 78 countries)**



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The prevalence of selected key terms in the curricula varied by region and country (**Figure 2**). Among the Latin America and the Caribbean countries, key terms related to sustainable development are common in Guatemala and Nicaragua, but much less so in Argentina, Belize, Dominica and Haiti. In sub-Saharan Africa, almost all key words related to sustainable development are found in Mauritius, but none in the United Republic of Tanzania and 10 per cent in the Democratic Republic of the Congo and Niger. In Europe and Northern America, none are found in the United Kingdom, and only 30 per cent were included in Croatia, France and Hungary.

**Figure 2: Percentage of key terms related to sustainable development and global citizenship in national curriculum frameworks, selected countries, 2005-2015**



A global mechanism to monitor curriculum content would require a systematic listing of national curriculum frameworks and a coding protocol to analyse curricular materials. Such a mechanism would also require close collaboration between education ministries and regional or international organizations to ensure that the information is valid and robust.

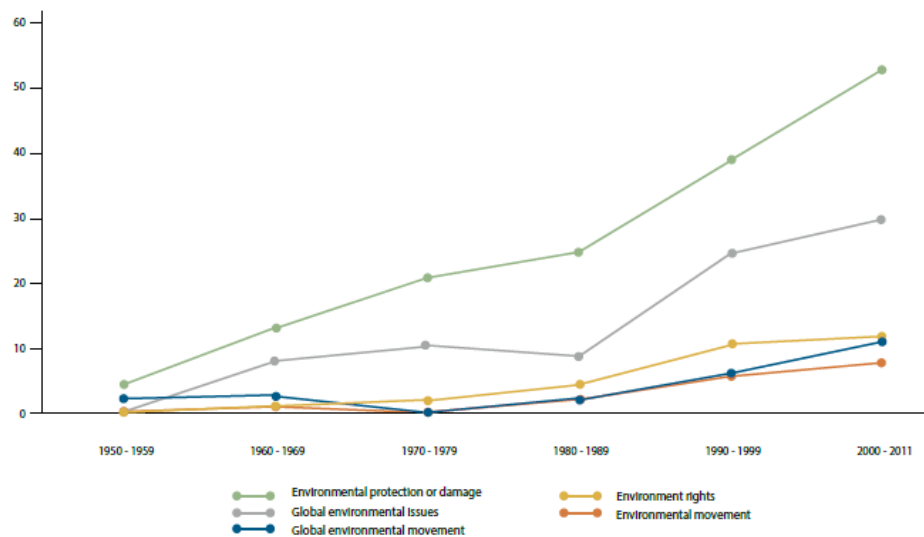
*Textbook content:* in many respects, textbooks reflect classroom reality more closely (in terms of both contents and teaching methods) than official policy statements. Analysis for the 2016 GEM Report compiled three datasets on secondary school textbooks in history, civics, social studies and geography. The vast majority of textbooks were drawn from extensive textbooks collections, notably the Georg Eckert Institute for International Textbook Research in Germany.

This analysis shows that by the latest decade, close to 50 per cent of the textbooks mention human rights, in contrast to around 5 per cent earlier in the century. In addition, the proportion of textbooks mentioning women's rights has increased since 1980, but with significant regional variation: only 10 percent of textbooks in the Arab States embrace gender equality in contrast to 40 percent in Europe and North America and sub-Saharan Africa.

Five indicators were used to measure the extent to which textbooks include an explicit emphasis on environmental issues. They include: whether environmental protection or damage is discussed in at least a paragraph, whether this issue is linked to rights, and whether it is discussed as a global issue. Coverage of environmental protection or damage in textbooks has increased dramatically since the 1950s. While in the 1950s, only close to 5 per cent of textbooks discussed this issue in at least one paragraph, 50 per cent did so over the 2000-2011 period **(Figure 3)**.



**Figure 3: Percentage of textbooks that include an explicit statement on environment**  
(Source: Bromley et al. 2016)



*Teacher preparation:* Preparing teachers to teach topics related to sustainable development and global citizenship is equally important to mainstreaming relevant content in curricula and textbooks. Yet, data collection tools of the content of teacher education programmes are rarely used to gauge teacher preparation in these areas. New tools would be needed to allow for greater standardization and comparability.

The application of a standard coding protocol to the curricula of teacher training institutions or to professional development opportunities would be a positive step in this direction. Sustainability knowledge and skills could also be included as a global competence in future rounds of the Teaching and Learning International Survey (TALIS). Knowledgeable and skilled teachers are critical for progress in Target 4.7.

## **Testing for sustainability knowledge and skills**

There are challenges to testing knowledge and skills for sustainable development. They include the scarcity of relevant student assessments or specially developed opinion or value surveys, the difficulty in developing test items that are context-relevant but not culturally biased, and the broad scope of target's topics and the relative lack of research on adult learning.

Learners' knowledge of basic facts in world history, geography, international institutions and globalization could serve as a starting point to measuring and monitoring target 4.7. Yet, few assessments in this area exist. The 2009 International Civic and Citizenship Education Study (ICCS) included a specific item on knowledge of the Universal Declaration of Human Rights, which could be adapted in different settings, together with other items, to assess learner knowledge of global issues. Preparing learners for a future of climatic and environmental instability begins by helping them understand issues such as why and how climate change takes place, and its likely effects on habitats and ecosystems.

The 2006 PISA provided internationally comparable data on students' knowledge of the environment and related problems, the sources of this knowledge, their attitudes on environmental issues and the relationship between their results in environmental science and their environmental attitudes. In 2016, UNESCO and the International Association for the Evaluation of Educational Achievement (IEA) collaborated in the area of measuring global citizenship and sustainable development. In the 2016 ICCS assessment, students were asked to rate the seriousness of a broad range of threats such as the extent of poverty, living standards, human dignity, economic well-being, and environmental health. These ratings provide an

indication of students' awareness of global issues, and responses to individual items provide a perspective on profiles of concern.

The Southeast Asia Primary Learning Metrics is developing a student assessment of literacy, numeracy and global citizenship in grade 5. In 2016–2017, at least six countries in the region are piloting the assessment tools. By 2020, all countries of the Southeast Asian Ministers of Education Organization and the Association of Southeast Asian Nations are expected to join.

Data on adult knowledge and skills related to global citizenship and sustainable development are limited in the extreme. Most data sources focus on older children and adolescents. Exceptions includes the Global Values Survey and International Social Science Programme's survey of environmental attitudes and behavior.

Another assessment of sustainability knowledge is the Sustainability Literacy Test (Sulitest), which aims to provide higher education institutions, companies and other organizations with an internationally comparable and locally relevant tool. A pilot phase was conducted between 2014 and 2016 with the participation of 260 universities in 35 countries. More than 55,000 students and faculty members from 550 higher education institutions in 57 countries have taken the test so far, 47% of whom in examination mode. On average, participants answered correctly 54% of core questions in examination mode and 60% in learning mode. While scores do not differ significantly by gender or socio-economic status, there is some variation by subject. Participants performed much better in questions related to human rights and the economy than to environmental issues. Since September 2016, the matrix of topics and the format of Sulitest are aligned with the SDGs framework. A new specialized module is fully dedicated to the SDGs. 16,575 candidates from 170

universities in 31 countries took the Sulitest between September 2016 and July 2017, with an average score of 55% of expected answers.

If we are to capture target 4.7's intent to provide *all* learners with knowledge and skills to promote sustainable development and global citizenship, efforts are needed to strengthen the knowledge base on out-of-school youth and all adults.

### **Concluding observations**

The global indicator framework of SDGs was adopted under the assumption that country compliance (participation) is voluntary and should be based on country data instruments. This is currently not the case. Even if UIS validates country reports to the revised and updated UNESCO survey of the 1974 resolution, the resulting information will be of limited value. We do not suggest trying to improve on this data collection strategy, which is flawed in many respects. We believe that the 2016 GEM Report provide evidence, which while still partial, gives a more accurate view of country efforts and commitment to the areas mentioned in target 4.7. International comparability may not be achieved but a more nuanced template of information is more likely to affect change in policy and practice at the national level. Whether, as a result, schools and teachers develop new models of learning experience and pedagogy is unclear and not been demonstrated. Aggregating best practices and school initiatives in this regard will be critical in the future.

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# Connecting Research and Practice in Environmental Education: Recognizing and supporting boundary work

Nicole Ardoin, *Stanford University*

## Introduction: The space between research and practice

Now more than ever, our world is facing pressing environmental and sustainability issues in a range of spaces, from water quality and quantity, to habitat destruction and land-use transitions, to declining ocean health, to climate change (Steffen et al. 2017; Rockstrom et al. 2009). As natural scientists from numerous disciplinary and interdisciplinary perspectives struggle to keep pace with these rapidly shifting systems, equal if not greater challenges are occurring with applying dynamic models and projections to practical dimensions.

This week, for example, a lead editorial in *Nature* proclaimed extreme weather events to be the “new normal” while concurrently lamenting the challenges of applying climate science to such issues (Imperfect Storm, *Nature*, 31 Aug 2017). The editors begin by discussing two key reasons for this mismatch: *insufficient resources* and *incompatible politics*. The third reason the editors give behind challenges of applying science to practice seems particularly resonant for environmental education: they describe climate science as existing at “the front line of a *cultural switch* that sees science as listening to society’s questions, instead of simply offering answers” (emphasis added, Imperfect Storm, *Nature*, 31 Aug 2017, p. 499).

Relatedly, a current *Nature Climate Change* commentary (Hewitt, Stone & Tait, September 2017) explores solutions in this space. When asking how to improve the use of climate science data in decision-making, the authors emphasize the importance of creating a dialogue between information users and providers to enhance the “uptake and use of climate information for decision-making and policymaking” (Hewitt, Stone & Tait 2017, p. 614).

Reflecting on these, and similar, calls for enhanced engagement between researchers, policymakers, and practitioners suggests that perhaps we are indeed at the precipice of a cultural shift in the broader socio-scientific sphere. Knowledge mobilization, research translation, knowledge co-production, and community-based research are just a few of the approaches that encourage more permeable relationships between research, practice, and policy; nonprofit organizations, funders, government agencies, and scholars increasingly use these terms and frameworks to signal a connection between research, practice, and policy during the research production and use processes. In fields from museum studies (Sobel & Jipson 2016) to public health (Wethington & Dunifon 2012) and education (Vanderlinde & van Braak 2010; Levin 2013), the desire, need, and recognition of greater engagement between those working on the ground and those researching and evaluating phenomena has grown over the past several decades (Weiss 1979; Walter et al. 2005).

Although initial discussions in these diverse contexts suggested a linear view of direct transmission, drawing from a biomedical perspective of translational research (Wethington, Herman & Pillemer 2012), more recent work highlights contextual complexities inherent in connecting research with practice (Ball 2001) or policy (Bridges et al. 2008). Brokkamp and Van Hout-Wolters (2007) describe a common refrain related to this challenge, saying, “educational research yields

few practical results [and] is limited in practical use” and, at the same time, “practitioners make little (appropriate) use of educational research” (in Vanderlinde & van Braak 2010, p. 302).

These challenges have motivated researchers to seek creative approaches to research dissemination, including reconsidering knowledge production processes, encouraging more collaborative work, and exploring mediating uses of technology (Englert & Tarrant 1993; Hewitt, Stone & Tate 2017; Nutley et al. 2007). In the health sciences, discussions of translational research have given way to research-and-practice models, community-centered models, and publicly engaged scholarship (Wandersman & Lesesne 2012; Crosnoe 2012). Such approaches focus on the community context and capacity as core considerations in research design, implementation, and outcomes, emphasizing that, when done well, the research findings are naturally applicable to practice.

### **Connecting research and practice in environmental education:**

#### **Trajectories and opportunities**

Shifts and tensions are evident though too, in the growing interest in connecting environmental education research with practice and policy. A field resulting from the nexus of two areas focused on the public good—education and environmental conservation—environmental education sits at the confluence of social and natural science, built on a platform of action and engagement. Yet, inherent in the process of educational and social-scientific research is a stretch between theoretical questions and practical application. As described, similar to educational studies, or those applying climate science to practice, the content, quality, and nature of the dialogue between information users and providers in



environmental education is key in considering the role of research in the field's future directions.

Assuming that enhancing this relationship between research, practice, and policy is a worthwhile endeavor in terms of improving the quality of the process of environmental education as well as its outcomes, one might ask:

*How might we effectively facilitate and bolster the contributions of research to advancing the policy and practice of environmental education?*

Having worked at the intersection of environmental education research/practice for nearly two decades provides some grounded perspectives to address this question. The perspectives draw on interactions with a range of disciplines, organizations, and individuals, each offering slightly (or vastly) different ideas of the nature, purpose, and application of knowledge; the role of research and of practice; and strategies for navigating the territory betwixt the two.

Across that diversity, however, some overarching concepts emerge as centrally important to an effective practice/research interface, particularly with regard to influences on the future direction of the environmental education field.

The literature on knowledge mobilization (Levin 2013; Bennet & Bennet 2007), research translation (Wethington & Dunifon 2012), boundary work and science communication (McGreavy et al. 2013), and related areas offer similar suggestions.

## **Grounded in experience: Three principles for connecting environmental education research and practice**

- 1) ***Research and practice are and must be engaged in a dialogical relationship.*** For effective change to occur, research must influence and have uptake in practice; and similarly practice can and should influence and inform research.

Even for those committed to connecting research with practice, the relationship is all-too-often considered a one-way mechanism, as reflected in the common phrase “research to practice.” The term “research *and* practice” is increasingly gaining in use, as are related terms including collaborative research, science-informed practice, knowledge co-production, and interactive research (e.g. Lemos & Morehouse 2005; Baldwin 2000). Although not synonymous, the intention behind such terms is to recognize that research and practice co-exist in a system wherein they influence each other.

Researchers whose work speaks to practical and pressing problems of the day draw inspiration and grounded understanding from practitioners working in the field. Certainly environmental education “practitioners” are not a monolithic group: some may work in a residential program setting wherein their important questions relate to the longevity of transformative connection-to-nature experiences; others are funders whose questions may relate to how the effects of numerous and varied environmental education experiences connect and layer over time. Researchers who engage in discussion with, observation of, and collaborative practices with practitioners are able to more deeply listen to the questions, consider the theoretical underpinnings, and dynamically explore such questions in meaningful context.

- 2) Ensure that research, practice, and policy stakeholders interact as dynamic partners in **developing a shared vision** of the problem-definition as well as problem-solving space(s). To do so, **co-develop processes and structures** (e.g., programs, tools, initiatives) that systematically and regularly connect research and practice.

Having programs, systems, and structures in place to support the work of regularly connecting research and practice, and developing support tools that ensure the work progresses, is crucial. In some instances, those tools may look like *Environmental Education Research Bulletins* that translate research articles into “Bottom Lines” for practice.<sup>7</sup> In other cases, those tools may be technology- or web-based, providing dynamic interactives and decision-support mechanisms (Hewitt et al. 2017; Cravens & Ardoin 2016).<sup>8</sup>

From a utility perspective, it is critical to have evaluation systems that are part of the research/practice interface. Those systems can ask a range of question such as:

*Do the systems, programs, and tools serve the  
purpose for which they were designed?*

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<sup>7</sup> *Environmental Education Research Bulletins* are produced through a partnership with ChangeScale, a regional consortium of environmental education practitioners; the North American Association for Environmental Education (NAAEE); and Stanford University researchers. Bulletins are available here: <http://www.changescale.org/resources/environmental-education-research-bulletins/>.

<sup>8</sup> Examples of technology-based tools include NAAEE’s eePRO online community: <https://naaee.org/eeepro>; decision-support tools created to support the Marine Protected Area development process, of which an archive is available here: <https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Network/Central-California>.

*Do they support the research/practice relationship in  
the way that we, as a collective community,  
envisioned, desired, and need?*

*If so, what have we learned from our successes in  
using research to inform practice, and vice versa?*

*If the structures are not effective in the way we  
desired, what could we change to better meet our  
community's needs?*

*Moving beyond assessment and evaluation, to the  
innovation space, we might ask: how does our  
community remain involved with new research, and  
what might that mean for the practice of  
environmental education?*

Emphasizing the interconnectedness of the research/practice relationship, how might researchers be encouraged to work with new practitioner partners or “unusual suspects”? Similarly, how might researchers have a broader vision of what stakeholder groups may be considered practitioners—as well as what fields of research are considered relevant to the environmental education space? How might we collaborate with partners who ask questions beyond our comfort zone?

- 3) Honor and support the key role of **boundary work** in connecting research with environmental education practice and policy.

I move towards a close with an invitation related to boundary work. Initially developed as focusing on the relationship between science and policy (Gieryn

1983), boundary studies have expanded to encompass “activities of those seeking to mediate between knowledge and action” (Clark et al. 2011).

Researchers and practitioners in sustainability studies, climate science, science translation, and natural resource management, among others, have considered what makes for effective boundary work, under what conditions, and for whom, with a particular emphasis on making science actionable for practitioners, defined broadly (Matson et al. 2016). In this world, practitioners often include policymakers, philanthropic foundation officers, planners, program designers, community organizers, and others (McGreavy et al. 2013; Matson et al. 2016).

Findings from the sustainability and natural resources fields emphasize three primary elements that contribute to boundary-work success: first, individuals and organizations who themselves span research and policy/practice are most likely to be seen as accountable, credible, and trustworthy in both realms. Second, these individuals and organizations need to be able to channel and translate the concerns, experiences, and expertise of multiple levels of stakeholders—researchers as well as practitioners—at various levels, and also recognize that different kinds of knowledge are valuable in defining and addressing problems. Third, processes that support knowledge co-production enhance credibility and trust; in the process, they enhance the likelihood of knowledge uptake in policymaking and other applied realms.

What, then, do these boundary-work learnings mean when applied to environmental education? In environmental education, we have few, and often underdeveloped and under-resourced, boundary organizations; similarly, we systematically underinvest in individuals working in boundary spaces. This may

be because the crux of our field relies on communication and education skills and, therefore, we expect ourselves—whether researchers or practitioners—to be those translators and communicators.

Similar to other fields, we have yet to recognize the specialized role and training required to play this translational role. Yet we know from research in other fields that it requires specific skills, expertise, focus, and resources to be effective in this role. Asking boundary agents to do so simply as an add-on to one's existing work is not functional or effective for multiple reasons. Key to unpacking this is recognizing some people are researchers, some are practitioners, some policy entrepreneurs who work across boundaries. These boundary agents are a much smaller percentage but there are critical because of their ability to translate, to make relevant (in both/all directions).

I leave with this call:

In these critical times, perhaps some of our best, most strategic, and wisest investments in the future of environmental education—and the role that research in this field is certain to play in addressing today's environmental and sustainability issues—may be to invest in and support in boundary organizations and individuals. Carefully considering the identity of people and organizations best positioned and skilled to connect research with policy/practice, and then providing them with further training and support, may be one of the most important building blocks for developing and growing an integrated, holistic future for environmental education. Fields such as sustainability science have asked, “What are the specialized skills and support that those translational boundary people and organizations need? How can we support them? And what are the

tools that are needed? What are the innovations that are needed in the tools?”  
(McGreavy et al. 2013)

### **[ In sum ]**

As we focus on visionary opportunities for addressing some of the world’s most challenging issues, such as those outlined in the UN Sustainable Development Goals, we can boldly (re)consider an integrated role for environmental education in coalescing science, policy, and environmental action. For the field of environmental education to proceed in this unified, focused, and research-informed manner, researchers and practitioners must be aligned to engage in productive dialogue and action toward addressing the outlined priorities.

Yet, we must ask: *Do we have the necessary expertise, as well as time, energy, and resources, among our current individuals and organizations that function in the “boundary” role? Or do we need more of an deliberate focus on boundary work in environmental education?* I argue that, to undertake the first two principles effectively (**creating a more discursive, dialogical relationship between research/practice in environmental education**; to develop and implement **structures and processes that facilitate a continuous practice/research reflective dialogue**), we need to invest more explicitly and intentionally in principle three: **boundary work**.

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## Notes