



Editorial

Exploring Interdisciplinary Approaches to Education for Sustainable Development

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Introduction

This special issue was envisioned to collect and share new research and innovations on the use of interdisciplinary teaching and learning approaches in the implementation of education for sustainable development (ESD) and with the specific aim to explore the transformative potential that interdisciplinary approaches to ESD can achieve and how they can be effectively implemented.

Where possible, authors were encouraged to specifically consider in their articles how interdisciplinary education for sustainable development could be applied to strengthen transformative learning processes and actively engage learners as actors for change in the pursuit of sustainable development. Interdisciplinary education for sustainable development is increasingly referenced as a valuable mechanism for strengthening education and learning systems' overall quality and relevance. The concept of sustainable development and the field of sustainability science



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draw upon a wide range of disciplinary perspectives and methods, and their overall value is found in their ability to create holistic, interdisciplinary frameworks for understanding and meaning-making.

Education for sustainable development (ESD) was originally framed and acknowledged as an important part of the global pursuit of sustainable development during the UN Conference on Environment and Development, also known as the Rio Earth Summit, in 1992, and was detailed in paragraph 36 of the conference outcome document *Agenda 21* (United Nations, 1992) which 178 national governments adopted. ESD has gained increasing international attention since the launch of the United Nations Decade of Education for Sustainable Development in 2005. At the end of this decade, the Aichi-Nagoya Declaration affirmed “the growing international recognition of ESD as an integral and transformative element of inclusive quality education and lifelong learning and an enabler of sustainable development” (UNESCO, 2014). Previous research has found that ESD-relevant pedagogies have made a more substantial transformative impact on primary and secondary education than the specific sustainability content (Laurie et al., 2016) and that the development of sustainability literacy directly challenges the hidden curriculum of unsustainability that remains prevalent in practice (Howlett et al., 2016; Wals, 2019).

Significant research on the practice, approaches, and outcomes of ESD has focused on its implementation in higher education. Comparative research on ESD in primary and secondary education has systematically focused on differences between policies and curriculum at national levels. However, there also remains a lack of empirical studies that find good ways to demonstrate the effectiveness of ESD (Boeve-de Pauw et al., 2015).

While the importance of interdisciplinary and transdisciplinary approaches in ESD is often argued, there remains a limited amount of research on how this is being practiced in different schools worldwide and on what outcomes and impacts this achieves. A recent review of published research on teacher education for sustainable development identified two lines of further inquiry that could help advance the field; these were “action research orientation toward inducing broader systemic changes” and “inter- and transdisciplinary research modes with their focus on experimentation and utilization of diverse knowledges” (Fischer et al., 2022). Furthermore, this review also finds promising opportunities for research that explores interconnections in ESD between actors, processes and approaches, and outcomes, as well as between explaining changes at individual and structural levels (Fischer et al., 2022).

Interdisciplinary approaches to ESD are seen as an essential way to challenge dominant paradigms and the hidden curriculum that continues to emphasize unsustainable ways of examining and making meaning of the world around us. They can develop foundational forms of understanding that allow

learners to better traverse across the complex challenges and multiple dimensions framed in the concept of sustainable development. Critical insights are urgently needed to advance our knowledge on how to develop, integrate, and implement such approaches into our education systems and to understand how the practice of interdisciplinary ESD can be oriented towards creating transformative learning.

Background

The concept of sustainable development presents a broad-reaching and holistic development narrative aimed at balancing society's activities to achieve well-being for all, ensure access to fundamental rights and services, protect and conserve natural systems, and nurture prosperous economies. The diverse nature of sustainable development's concerns is notably captured under the framework of the 17 Sustainable Development Goals (SDGs) and their subsequent 169 targets, which were agreed upon by 193 national governments at the UN General Assembly in *Transforming our World: the 2030 Agenda for Sustainable Development* (2015) after a 3-year process of global consultation and negotiation. The SDGs are also notable for their interconnected nature, which requires responding to trade-offs and synergies between different goals.

Sustainability issues can be complex and necessitate a multi-perspective, multi-discipline examination to comprehend properly. In teaching, socio-scientific issues (SSI) compel the use of active learning methods that facilitate learners to engage in dialogue, discussion, and debate while also addressing scientific topics from different perspectives that reveal the interconnected nature of these issues. SSIs often have a controversial nature that also necessitates the evaluation of ethical concerns to arrive at a decision (Zeidler & Keefer, 2003). Interdisciplinary and transdisciplinary educational approaches thus provide a particular means to work with SSIs and sustainable development topics that are especially relevant to navigating complex, contextual and contested challenges. This level of complexity, though, and the broad topical focus of sustainable development can overwhelm teachers and hinder their efforts to work with ESD (Kioupi & Voulvoulis, 2019).

Even though the benefits of interdisciplinary education within ESD are well recognized, resistance to this has also continued because it is argued that interdisciplinary approaches are too complex to incorporate into existing educational structures (Summers et al., 2005). Currently, teachers and teacher educators are often trying to integrate interdisciplinary education into systems and structures that, at most, provide space for multidisciplinary teaching (McKenzie & Abdulkadri, 2018). This necessitates the need to examine further how interdisciplinary approaches to ESD are being implemented, what specific benefits they have for students' learning outcomes, and what potential

they have in facilitating transformative learning, but first, we must also consider how this divide between disciplinary education and interdisciplinary/transdisciplinary education has evolved.

Interdisciplinary teaching approaches stand in contrast to the long tradition in academia, science, and education towards a division of disciplines and distinct fields of study. This is a tradition that began in 1637 when Rene Descartes (1637/2004) laid out his philosophy of scientific rationality and deductive reasoning in *Discourse on the Method* that depends on dividing things (i.e., items of study) into their smallest parts to be observed and studied individually, without influence from one another. This philosophy was crucial to the discourse of the Age of Enlightenment, and it is credited for achieving significant advancements in human knowledge as separate disciplines developed and formed their own systems and rules for investigation and knowledge production.

Disciplinary fields of study and learning themselves do not stand in conflict with interdisciplinary teaching approaches, but the separation and divisive approach of Cartesian philosophy has left us with certain limitations in the way we look at the world around us. The division of knowledge (as well as of mind and body) means that this approach often overlooks the complex relationships between items and is too narrow-sighted to see the big picture. The disciplinary approach to science, research, and knowledge production, as well as its focus on rational, deductive reasoning, has also heavily influenced our traditional educational systems and teaching approaches.

Interdisciplinary education provides many noted benefits and learning outcomes, especially about the depth of learning achieved and the application of learned knowledge and skills. Interdisciplinary teaching approaches facilitate learners to explore important concepts and information from different perspectives and subjects. This is valuable in strengthening foundational knowledge and its application through acquiring knowledge and understanding of ideas as they relate across disciplinary boundaries, as well as a more practical awareness of when and how to apply new knowledge and skills in different contexts. By taking a more holistic approach, interdisciplinary education is a meaningful way to aid the development of skills for integration, the capacity to connect ideas, systems thinking and to anticipate future outcomes better. By increasing the application of learning to address real-world issues, interdisciplinary education is also acknowledged for enhancing the human dimension of education through improved recognition of social and personal linkages to issues, recognising and appreciating ethical concerns, and incorporating the role of feelings, personal interests and values in the learning process. In addition, interdisciplinary education is seen to facilitate the development of competencies for life-long learning by gaining deeper insights into the process of learning, practicing critical thinking and reflection, recognizing the

influence of one's biases, and better tolerating ambiguity and productively working with disagreements.

Definitions: Multidisciplinary, Interdisciplinary and Transdisciplinary

A *discipline* is recognised as a field of study or a subject, but the word discipline can also be defined as a rule or system of rules governing conduct or activity. While the second definition seems less appropriate when we talk about educational subjects, traditionally, each of these developed as their own academic fields of study and were directed by their own rules, procedures, and approaches that were distinct from other fields. When we add different prefixes to discipline, we begin to consider various ways of working between and across disciplines. *Intra* means within or during, and *intra-disciplinary* is working within one subject (also referred to as *monodisciplinary*). *Cross* means across or including different groups, and *cross-disciplinary* is viewing one discipline from the perspective of another.

Multidisciplinary: *Multi* means multiple or many, and *multidisciplinary* involves different subjects or disciplines investigating the same issue or topic and sharing their various insights and perspectives on it. Multidisciplinary creates a collaboration of individuals from different disciplines working together; however, at this level, all individuals draw solely on their own disciplinary knowledge, and there is little merging of these various perspectives. Multidisciplinary education requires coordination of lesson plans so that different subjects take up a common topic at the same time. Still, it does not require the individual subjects to combine teaching with other subjects or to integrate their desired learning outcomes.

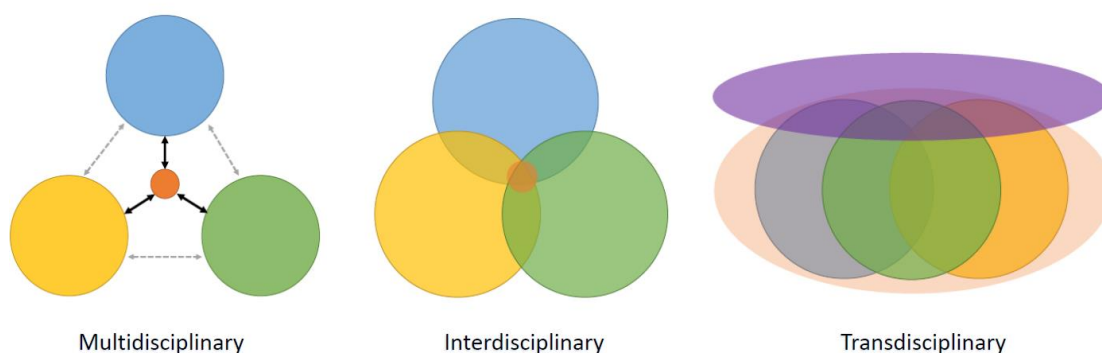
Interdisciplinary: *Inter* means something between or among, and it can also be used to mean together or mutually. *Interdisciplinary* aims to integrate knowledge and methods from different disciplines to create a real synthesis of approaches. Many modern fields of study, such as gender studies, neuroscience and cybernetics, have naturally integrated an interdisciplinary approach to achieve a more holistic understanding. Interdisciplinary education is a step further in this collaborative learning process. At this level not only is an integration of subjects targeted, but the development of the whole learner is also targeted through an integrative use of knowledge, skills, and values in an applied learning context.

Transdisciplinary: *Trans* refers to both across and beyond, and it can also refer to changing thoroughly such as in transformation. *Transdisciplinary* aims to create a unity of intellectual frameworks beyond the disciplinary perspectives and involve actors from different fields and sectors

of society. Transdisciplinary seeks an extension of this collaboration to a place where unity of these different disciplinary frameworks can be achieved that stands beyond any one of the individual disciplinary perspectives. It also clearly identifies its starting point as real-world issues, and it encourages greater collaboration among different actors, including academics, politicians, local communities, and businesses. Transdisciplinary education is about exploring a relevant concept, issue or problem that integrates the perspectives of multiple disciplines to connect new knowledge and deeper understanding to real-life experiences. Transdisciplinary learning is collaborative in nature, and it works to create an overarching unity among different ways of looking at and understanding the world around us.

The following figure provides a visual representation of these three concepts and the level of interaction that occurs between different disciplines. For multidisciplinary, each discipline interacts with the topic of focus (*depicted by the orange circle*) from their own perspective and the individual views on the topic from each discipline are juxtaposed, but there is no actual overlap or merging of knowledge. For interdisciplinary, there is an active interaction between the disciplines and an effort to blend different knowledge and achieve a synthesis of understanding. For transdisciplinary, the topic of focus becomes the overarching framing and the boundaries between the disciplines are dissolved. In addition, transdisciplinary incorporates an active engagement with the real world and with non-academic stakeholders (*depicted by the purple oval*).

Figure 1. Visual depiction of Multidisciplinary, Interdisciplinary and Transdisciplinary concepts



Key: blue, yellow and green circles = represent different disciplines; orange circle = the topic of focus/study; purple oval = represents an engagement with real-world actors and/or issues.

Choi and Pak (2006) provide a thorough review of the terms multidisciplinary, interdisciplinary and transdisciplinary to clarify how these concepts are understood and defined. They explain that these

three terms are used to distinguish different “multiple disciplinary approaches” and represent varying degrees across the same continuum. They also provide the following definitions:

- *Multidisciplinary*: draws on the knowledge from different disciplines but stays within the boundaries of those fields;
- *Interdisciplinary*: analyzes, synthesizes and harmonizes links between disciplines into a coordinated and coherent whole;
- *Transdisciplinary*: integrates the natural, social and health sciences in a humanities context, and in so doing transcends each of their traditional boundaries (Choi and Pak, 2006, p. 359).

It is also possible to demarcate the concept of interdisciplinarity by shifting the focus away from teaching practices and considering the specific impacts and learning achievements that are produced, i.e. the student or learner perspective. Rhoten et al. (2000) define three distinct aspects: interdisciplinary education, interdisciplinary learning, and interdisciplinary understanding by categorising the possible targeted outcomes from interdisciplinary teaching.

- *Interdisciplinary education*: is defined as “a mode of curriculum design and instruction in which individual faculty or teams identify, evaluate, and integrate information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of knowledge to advance students’ capacity to understand issues, address problems, appraise explanations, and create new approaches and solutions that extend beyond the scope of a single discipline or area of instruction” (Rhoten et al., 2000, p. 3).
- *Interdisciplinary learning*: drawing on Klein’s earlier work, is defined as “neither a subject matter nor a body of content. It is a process for achieving an interpretive *synthesis*, a process that usually begins with a problem, question, topic, or issue” (Klein, 1990, p. 188).
- *Interdisciplinary understanding*: drawing on Boix Mansilla’s earlier work, is defined as “the capacity to integrate knowledge and modes of thinking in two or more disciplines to produce a cognitive advancement – e.g., explaining a phenomenon, solving a problem, creating a product, raising a new question – in ways that would have been unlikely through a single disciplinary means. ... the *integration* of disciplinary perspectives is a means to a purpose, not an end in itself” (Boix Mansilla, 2005, p. 15).

The abilities to produce synthesis and integration are key aspects of interdisciplinary learning and understanding. By focusing on the learning outcomes facilitated by interdisciplinary teaching, the perspective shifts towards the role that interdisciplinary learning and understanding play in shaping the development of individuals’ conceptual learning framework.

Ivanitskaya et al. (2002) found that the outcomes of interdisciplinary learning facilitate higher-order thinking, as well as the specific capacities to develop meaningful connections and integration across diverse knowledge and experience. Interdisciplinary approaches, by focusing on central themes and the overarching narratives and by critically reflecting on the underlying thinking, allow curriculums to better deal with the rapid growth of disciplinary knowledge and the challenge to cover primary subject matter while also ensuring educational relevance to real-life contexts of the learners.

[!]Interdisciplinary education readily facilitates the development of structural knowledge: an understanding of higher-order relationships and organizing principles (Goldsmith & Johnson, 1990).

Declarative knowledge (factual information) and procedural knowledge (process-based information), used for problem solving or step-by-step task completion (Anderson, 1982), form the foundation for the acquisition of structural knowledge (Ivanitskaya et al., 2002, p. 98).

Cognitive scientists argue that our “knowledge structures” or “conceptual frameworks” which shape how we organise knowledge and create relationships between different facts are critical to how well an individual can utilise specialist knowledge in various settings and contexts (Baxter et al., 1996; Dorsey et al., 1999; Kraiger et al., 1993). This conceptual learning framework – as well as the capacity to synthesise and integrate understandings, apply different knowledge and perspectives in varying contexts, and operate in complex and contested situations – is a key learning outcome facilitated by engagement in interdisciplinary learning. “The tenet is that the organization of knowledge is at least as important as the quantity of knowledge accrued in helping the individual to determine when and how a set of declarative facts applies to a particular situation” (Ivanitskaya et al., 2002, p. 99).

Overview of Articles in this Special Issue

This special issue includes six contributions that explore the intersection of education for sustainable development and interdisciplinary education from different perspectives and draw attention to different dimensions of these concepts, as well as how they are conceived and implemented within different education systems. Articles in this special issue examine these concepts in terms of international understanding and the context of specific countries including Brazil, Canada, Croatia, Finland, Japan, Norway and Tanzania.

The first two articles look at how textbooks incorporate sustainable development topics and how they influence the use of interdisciplinary approaches within ESD teaching. **Pollari et al.** conduct a content analysis of Finnish textbooks to examine how they promote sustainable food waste behaviour. In a two-part analysis, they provide a data-driven analysis to identify the types of knowledge and a theory-driven analysis to classify the pedagogical styles represented in textbooks for home economics, biology and geography subjects. Content was divided into three information types: technical information, information related to reducing food waste, and information pertaining to sorting food waste. At the same time, the pedagogical styles were sorted into four types: neutral, injunctive, persuasive, and participative.

Several differences are noted between the way each subject addresses food education and promotes sustainable food waste behaviour, but more generally, it was also found that all textbooks respond to this topic based solely on their own subjects’ curriculums. There is no notable effort to incorporate interdisciplinary perspectives in these textbooks, although it is recognised that interdisciplinary approaches are essential in fostering transformative learning. The home economics textbooks were

the most thorough in addressing food waste, which compliments other studies that have also shown that home economics is often given the primary responsibility for addressing this topic.

Fiel'ardh examines how science textbooks for Japanese middle schools address the core ESD competency of *futures thinking*. As an introduction to this study, a concise review of the new framing of ESD in the Japanese curriculum is provided. It demonstrates how a more holistic and practical approach to ESD aims to empower globally conscious citizens who are both critically reflective and able to take responsible, informed action. In addition, the framing of futures thinking within this curriculum is explained and review of pedagogical approaches to facilitate futures thinking is also elaborated. In a two-part analysis, both the scientific content and context/methods of delivery are examined. A set of nine indicators of the futures thinking process are applied for coding with the main categories of “picturing the future”, “predicting the future”, and “planning for the future”; based on a framework provided in national guidelines.

This study highlights the crucial role that interdisciplinarity and developing a holistic perspective plays in the achievement of futures thinking competence. The qualitative analysis considers the pedagogical approaches presented in three chapters in these textbooks: 1) *Nature and Human*, 2) *Science, Technology, and Human*, and 3) *Sustainable Development*. In the *Nature and Human* chapters, students are provided with a comprehensive view of how strategic planning can promote biodiversity and environmental conservation. The chapters on *Science, Technology, and Human* emphasise energy education and risk management – including principles of precaution and adaptation. One of the reviewed chapters is also concerned with how technologies can be used to promote equality, and through this, the text embeds values of inclusivity, empathy and social responsibility. An interesting feature of the chapters in this section is their idea that different futures are possible and interconnected with present-day decisions and actions. Surprisingly, while the *Sustainable Development* chapters present the concept of backcasting as a planning method, they are also limited and generally superficial in how they present the SDGs. This article is valuable in its identification of multiple pedagogical approaches that support developing different aspects of *futures thinking* competence, as well as demonstrating how an interdisciplinary approach can transcend traditional scientific boundaries.

The following two articles investigate the perspectives of teachers towards ESD and interdisciplinary education, and they examine both the practical limitations of these perspectives and opportunities to build their capacities for meaningful and authentic implementation. **Mellingen** provides a comparative discourse analysis of how secondary school teachers from Tanzania and Norway across different subject backgrounds conceptualize sustainable development and what dimensions they

prioritise within their national contexts. Drawing on the discourse apparatus by Laclau and Mouffe (2014), the article identifies nodal points in the interviews conducted with these teachers which allows for a deeper analysis and understanding of the underlying narratives in their perspectives. Additionally, through focus groups with the same respondents, the author draws out conflicting positions in their perspectives and demonstrates several points of discursive struggle both within individual teachers' statements and between them.

The article draws out many unique points in these discourses, but there was a clear difference in the framing of sustainable development from teachers in the two countries. While Norwegian teachers emphasised the environmental dimension of sustainable development and perceived it in a global scope, the Tanzanian teachers focused more on the socio-economic dimensions of the concept and placed the concept much more in a local perspective. Although there is some explanation for this regarding the relevance of different Sustainable Development Goals in the two countries' context, there was a more troubling trend articulated as a Western exceptionalism discourse. In both countries, there was a reoccurring trend of teachers pointing to the myth of the West as a beacon for social development and highlighting the role that a high-wealth and technology-rich society plays in solving sustainability challenges. However, this was also a myth to which many teachers also showed internal struggles and contradicted in their own statements.

Armano Linta explores a three-year project to develop interdisciplinary teaching scenarios on sustainable development within the context of the Croatian curriculum. In 2019, the national curriculum for primary and secondary schools in Croatia included seven interdisciplinary topics, including sustainable development, which should be integrated into the different subjects and extracurricular programmes. Working with fifty teams of 3-5 teachers each, a total of 50 different scenarios were developed to respond to the 37 sustainable development outcomes laid out in the curriculum for grades 5-12. These scenarios included various activities, 3-5 in total, that take place in different subjects or extracurricular activities.

This article considers the overall value and replicability of the approaches taken in this project for developing teaching resources and engaging teachers in working with sustainable development topics. The approach towards having multi-disciplinary teams of teachers working together on real-life scenarios rooted in everyday issues and experiences provides ample opportunities for teachers to link the sustainable development curriculum to the expected outcomes for their own subjects. However, while the scenarios aimed to frame approaches for interdisciplinary teaching, there remained an autonomy of individual teachers and subjects to address individual components of the scenario in a way that is more multidisciplinary in nature. While this may be seen as a disadvantage

towards the desired aims of this project, it can also be viewed as an advantage in the context of the Croatian curriculum where subject-based teaching is the norm. There are no specific requirements for cross-subject teaching, thus allowing individual subjects to implement single activities within a scenario without being dependent upon a more integrated approach within a school for implementing the whole scenario. For those teachers involved in developing these scenarios and teaching resources, this work led to a meaningful strengthening of their appreciation and capacity for interdisciplinary collaboration in educational work.

The final two articles both critically reflect on the philosophical foundations of the concepts of sustainable development and ESD, and they question if both the lack of commonly agreed definitions and the unexamined, underlying elements in these concepts present significant barriers to their further mainstreaming. **Kohl et al.** discuss the philosophical foundations of ESD with a critical examination of UNESCO's roots in scientific humanism and consider if these foundations are at odds with different worldviews. By analysing 209 UN documents on ESD over thirty years, it is found that there is little grounding within educational philosophy regarding ESD; however, there remains a regular reference to the idea of humanistic education. The article thus further explores the epistemic foundations of ESD within the context of UNESCO's shared principles of humanism.

In the way of introduction, the article reviews the ESD's origins and development as a concept, as well as its discussion in academic literature. Following a discussion of UNESCO's general endorsement of humanism and humanistic education values, the authors challenge that these philosophical views do not align with and are sometimes in direct conflict with other prevailing worldviews. Numerous examples are provided from different religions that challenge the core humanistic belief that science and reason can fully understand the world and its 'divine' nature. The article concludes with three reflections on how to move forward and address the philosophical foundations of ESD. Most significantly, they draw attention to the fact that while ESD was originally rooted in the idea of transdisciplinarity, this has yet to be truly embedded into educational research and that doing so – by incorporating different ways of knowing and other voices in the discussion – could strengthen the global transferability and acceptance of this concept.

Stein et al. similarly present a critical reflection on the concept of sustainable development and challenge that the recent promotion of *green growth* emphasises a view that scientific knowledge and technological innovations will foster a path to sustainable development. They postulate that buried under a transformative language, the concept of sustainable development is merely a marginally improved version of the status quo that promises infinite growth and consumption. For this reason, it is challenged that we must look beyond ESD if global society is to respond effectively to

the challenges of the 21st century. It is further argued that ESD is founded upon a belief that there is one universal path towards sustainable development and that this in itself is a hegemonic and colonial single story of human progress.

The authors detail an alternative educational path based on the methodology of regenerative inquiry to empower them to navigate complex and uncertain futures while applying the value of intergenerational responsibility. Based upon the work over ten years developing a futures-oriented, transdisciplinary educational programme, they aim to challenge the perceived Western supremacist sensibility of development narratives and ESD. The counter-proposal presented in regenerative approaches to education focuses on both learning and unlearning as a more authentic form of *depth education*, in contrast with traditional *mastery education*. For example, the idea of diffraction is identified as a capability enhanced by such depth education. Diffraction is the ability to move outside of a narrow perspective and view an issue of concern from different layers (such as interpretations, emotions, systems, relationships, etc.) and multiple perspectives. Diffraction enhances an individual's lenses for dealing with both complexity and complicity and our collective histories and narratives that shape our current trajectory. Working with the four attributes of *emotional stability*, *relational maturity*, *intellectual discernment*, and *intergenerational responsibility*, the process of regenerative inquiry is detailed and readers are challenged to try out a self-reflexive practice.

Through these investigations into the interdisciplinary nature of education for sustainable development, we are challenged not only to think about what constitutes effective education and how we achieve it but also to contemplate why we engage in education in the first place and which core values and objectives are embedded in our education systems. In this sense, education must prepare learners to go beyond and transcend the limitations of the present and, in doing so, empower them to envision and enact a future that is more just, equitable, inclusive, and in balance with all living beings not just in principle but embodied in practice and our very being. Whether this transformation in education will come about through the concepts of *interdisciplinary*, *transdisciplinary*, *education for sustainable development*, or if an entirely new conceptualisation and terminology is needed, is yet to be seen. In these articles, we find an undercurrent to explore the unknown, embrace complexity and uncertainty in meaningful and confident ways, and apply learning to real-world action and engagement. Most importantly, we find issues to continue reflecting on, trialling and improving how education can empower these topics.

Interestingly, though, it is noted that not uncommonly to other ESD articulate, four out of the six articles in this special issue rely on the oft-quoted 1987 definition of sustainable development from *Our Common Future*. This in itself raises the question about the continual need to contextualise the

concept of ESD within the context of the Brundtland Report's definition of sustainable development and if this demonstrates a continued focus on framing ESD around the understanding of sustainable development and a troubling limitation to focus on further defining the E of ESD. While collectively, these articles show many inspiring aspects of pedagogical practices for further strengthening and integrating ESD's role in delivering education of high quality and relevance. We must wonder if all education is to help learners achieve a future that is more prosperous and sustainable for all, then do we need to further focus on how the pedagogical understanding of E in ESD – especially from its perspective of interdisciplinary and transdisciplinary approaches – is mainstreamed into broader educational discourse rather than the focus on lifting the concept of sustainable development?

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