



Editorial

Ingrid Schudel, Lesley Le Grange and Chris Reddy

The unprecedented levels of human influence on the global environment have drawn the attention of scientists to the extent that in 2002, the Nobel Laureate, Paul Crutzen, helped in postulating a new geological epoch named the Anthropocene (Crutzen, 2002). This idea is not new and Crutzen describes an observation by an Italian geologist named Antonio Stoppani who, in 1873, spoke about an ‘anthropozoic era’. Stoppani described this era as a ‘new telluric force which in power and universality may be compared to the greater forces of earth’ (Stoppani, 1873 in Crutzen, 2002).

Short (2009:7) indicates that this century will be one of continual technological advancement and burdens on the natural world from consumer demands. A citizenry capable of understanding the complexity of environmental issues and actively participating in their resolution is vital. Education approaches might therefore need to place renewed emphasis on the issues of the day, and to contribute to the resolution and prevention of both current and future environmental problems.

The education community’s most recent international policy guide is the *Education 2030: Incheon Declaration and Framework for Action* (UNESCO, 2016). This document links the concept of quality education to education for sustainable development (ESD), with the argument that ESD has the potential to enrich acquisition of other foundational competences such as literacy and numeracy. The *Education 2030* framework responds to the recently defined Sustainable Development Goals and centres on Sustainable Development Goal 4, which aims to ‘Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all’ (United Nations, 2015:12). This goal includes a target on ESD in a call for all learners across the world to ‘acquire knowledge and skills needed to promote sustainable development’ (United Nations, 2015:15). This target is a springboard for interaction with the other 16 Sustainable Development Goals, which all seek to set the world on a more sustainable path.

In this special edition of the journal, authors have reflected on different aspects of education – its purpose, intended learning outcomes, content knowledge, pedagogy and epistemological underpinnings. The focus has been mainly on teacher education and schooling in southern Africa, with an emphasis on the relevance of subject content, outcomes and concepts to contemporary challenges – the challenges of the Anthropocene. The feature papers in the journal draw on research from Botswana, Lesotho, Namibia, South Africa, Zambia and Zimbabwe.

The first section of the journal comprises think pieces that are theoretical explorations of how we might rethink curriculum and sustainability in the Anthropocene, making points

which we hope will encourage debate amongst our readership. The following section presents feature articles reporting empirical research related to the ‘on-the-ground’ sustainability and curriculum challenges amongst the environmental education community in southern Africa. The last section comprises viewpoint articles that are inspired by emerging ideas. We outline the contributions from each paper briefly below.

The think pieces raise critical questions in relation to the (post)human condition, the state of the planet, curriculum and sustainability. In the first think piece, Wayne Hugo uses the graphic images of Goya’s and Rubens’s paintings of Kronus eating one of his children as a metaphor for the gross inequalities between humans in the Anthropocene – that the current generation is denying their children the possibility of worthwhile choices by handing them an unequal world. Hugo hints at the unsustainability of the widening gap between rich and poor and, in view of this fact, raises the perennial curriculum question, ‘what knowledge is most worth learning’ – what knowledge should be included in the school curriculum? The images of Kronus could also serve as metaphor of how humans are recklessly consuming the biophysical treasures of the earth through unsustainable lifestyles in an era of consumerism.

In the second think piece, Lesley le Grange avers that we need to rethink sustainability and curriculum in view of a (re)turn to realisms because linguistic poststructuralism is no longer an adequate response to the (post)human predicament. By the (post)human predicament, he refers to the dominance of Anthropos that is destroying the earth’s biosphere on the one hand and on the other, the ironic potential of advanced technologies to destroy all life on the planet in the bio-genetic age. He argues that we live in uncertain times that require a rethinking of both sustainability and curriculum. Le Grange proposes improvisational jazz as a metaphor/figuration for a reimagined idea of curriculum.

The first group of research papers in this journal present empirical research providing insight into the challenges of environmental learning from the perspective of teacher professional development in in-service and pre-service contexts. Sirkka Tshiningayamwe presents a case study of a professional learning community with a focus on the biodiversity knowledge of science teachers. The case showed that teachers valued practical knowledge for conducting practical activities and fieldwork related to biodiversity, and that meaningful professional development aligned with teachers’ valued functionings can serve as a catalyst for capability development.

The next paper to provide baseline insights into teachers’ needs is Callie Loubser and Patrick Simalumba’s paper on environmental learning in Grade 8–10 Geography in the Caprivi Region in northern Namibia. This mixed-methods survey provides insights into teachers’ knowledge and confidence levels with respect to environmental education policy and in-service training; environmental curriculum topics and contextual responses to these; and the use of support materials, and teaching, learning and assessment practices.

Tshiningayamwe invokes a strong sense of the importance of engaging the teachers themselves in driving teacher professional development. An interesting case of this is the study by Ronicka Mudaly and Raeesa Ismail, who probe teacher agency and identity through their focus on teachers as curriculum innovators. This study, of teachers involved in a Bachelor of Education Honours programme in a South African university, highlights how teachers become self-regulating through developing strategies to actively research topics and deepen their

disciplinary knowledge. It also shows how a contextual review of teacher factors, learner factors, physical resources, school management and school ethos provided teachers with knowledge to teach innovatively, by using existing resources, or leveraging additional resources.

Jesse Schrage and Frans Lenglet present a framework for researching the implementation of EE/ESD in teacher education institutions. The framework also embraces the notion of capability, which the authors relate to the four 'pillars of ESD', and incorporates points similar to those raised by Tshiningayamwe, and Mudaly and Ismail. The framework is an amalgam of three theoretical premises, namely the theory of change, theory of education for sustainable human development and the theory of transformative learning. The authors identify factors that hinder and promote the implementation of ESD by applying the framework to review change-projects in two Botswanan teacher education institutions.

Nthalivi Silo and Mphemelang Ketlhoilwe use a lens of strong sustainability and collective agency to review the implementation of project-based learning as a strategy for introducing ESD. Their study, which also took place in two Botswanan teacher education institutions, highlights aspects of project-based learning that impact on a transformative project outcome as well as on student learning. Their cases illustrated how student teachers elicited learning opportunities and developed their initiative and collaborator practices through participating in environmental projects in the grounds of the institutions. They also illustrate the potential for embedding change-projects in traditional disciplines such as science education while warning that knowledge fragmentation and a culture of mono-disciplinarity can affect the transformative capacity of project-based learning.

One of the foci of the remaining group of feature papers is the integration of critical environmental issues into curricula – a key dimension of ESD highlighted by UNESCO's global action plan (2014). At Copperbelt University in Zambia, Overson Shumba, George Kasali, Yaki Namiluko, Beauty Choobe, Gezile Mbewe, Moola Mutondo and Kenneth Maseka reflect on the integration of socio-scientific issues into science-technology-engineering-mathematics (STEM) curricula. Moving from a focus on the integration of environmental issues, to a focus on the integration of specific local practices in order to deepen knowledge of environmental issues, Tichaona Pesanayi, Lintle Khitsane and Farasten Mashozhera investigate the integration of adaptive practices of water in agricultural science taught in selected primary schools in Lesotho, South Africa and Zimbabwe. One finding of this comparative study is that in South Africa, contrary to the other two countries, the teaching of agriculture and sustainable water use is largely excluded from the primary school curriculum. South Africa might have ignored the importance of this at its peril, which the current drought is highlighting.

The final section in the SAJEE comprises 'viewpoint' papers, which open up opportunities for debate as we pick up new ideas and challenges in our changing international and national contexts. Jannie Pretorius, Okkie Combrinck and Stephan du Toit draw on their own experiences to describe a link between personal aesthetics and an evolutionary or survival perspective on habitat and landscape. This viewpoint could stimulate further research into the authors' suggestion that such a landscape-based aesthetic still resonates with, and should be considered in, a modern society with tendencies to be driven by mechanistic and inorganic technologies.

The viewpoint paper by Christo Fabricius and Samantha McCulloch describes how environmental slogans can be varyingly interpreted within one organisation; and cautions environmentalists about the way in which we use slogans to communicate, market our organisations or causes, and reach out to others. Future research around this topic could explore the relationship between slogans and memes, and investigate environmental examples of the 'hijacking' of memes, both as envisaged by Dawkins and in its modern day interpretation and enactment in social media with its playful, creative and critical potential.

What this special edition indicates is that many students, researchers and educators in southern Africa are grappling with the question of how education should respond to the recognition of the global conditions we may call the Anthropocene. They are asking important questions about the purpose, underlying epistemological and philosophical assumptions, intended learning outcomes, curriculum content and teaching approaches we use. There is much food for thought and readers are encouraged to help us deepen, expand and advance the debate and our empirical explorations of how best to respond to the challenges of the Anthropocene through education. We also encourage readers and future authors to read across this and earlier versions of this journal, as these questions require us to draw with care and consciousness on the work that has come before, as we weave new findings and new insights into our field.

References

- Crutzen, P.J. (2002). Geology of mankind. *Nature*, 415(6867), 23.
- Short, P. (2009). Responsible environmental action: Its role and status in environmental education and environmental quality. *Journal of Environmental Education*, 41(1), 7–21.
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. New York: United Nations.
- UNESCO. (2014). *Roadmap for implementing the global action programme on Education for Sustainable Development*. Paris: UNESCO.
- UNESCO. (2016). *Education 2030: Incheon declaration and framework for action*. Retrieved 24 December 2016, from <http://www.uis.unesco.org/Education/Documents/incheon-framework-for-action-en.pdf>