


BOOK REVIEWS

Teaching climate change in primary schools: an interdisciplinary approach

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The Introduction chapter of the book ‘Teaching climate change in primary schools’ sets forward the purpose of the book, to serve ‘as a resource for all primary teachers and student teachers’ (p. 25). In doing so, it aims to ‘to address the challenges of teaching about climate change. . . the book aims to alleviate teachers’ fear and anxieties about their own perceived knowledge gaps and confidence levels’ (p. 25). The book is organised into four sections and 21 chapters, composed by 21 authors. The four sections include (i) Theory and philosophical approaches; (ii) climate-change education: Literacy-based approaches; (iii) climate change education: STEAM and (iv) climate change education: Pedagogies of hope and action. The authors contributing to this book are educators, mostly working in teacher education programs, and mostly specialising in arts and humanities, in early childhood and primary settings. Notably, two of the authors specialise in religious studies. These backgrounds situate the authors well in relation to addressing early childhood and primary education pedagogies, as well as in adding a religious perspective.

The book presents an interdisciplinary approach to climate change education (CCE). It addresses the implementation of CCE across a wide range of primary curricular areas, thus casting a wide net for CCE. Two main aspects stood out as particular strengths of the book. The first is its strong focus on pedagogy, and the second is its hands-on approach, providing practical and applicable lesson plans and resources for teachers to use. The book presents a range of pedagogical models and considers their application to CCE. For example, the Teaching Personal and Social Responsibility (TPSR) curriculum model, and others. The applications of the diverse pedagogical models create a rich tapestry of approaches and strategies for teachers to draw upon.

Another aspect of this pedagogical richness is the book’s hands-on approach, providing many practical and applicable teaching strategies. In particular, the way resources are integrated within the chapters of the book, where each of the 21 chapters provides practical suggestions for teaching topics related to climate change (CC). The resources are rich, varied and exciting in relation to their affordances for teaching. For example, Chapter 7 entitled ‘Listening, re-acting and acting: Stories from plants and animals to elicit empathy and dialogue about climate change, in the classroom and beyond’ by Miriam Hamilton, presents beautiful children’s stories and explains how these may be used for teaching CC. Similarly, Chapter 18 entitled ‘Creating teaching resources in response to the rapidly changing nature of climate change’, by Brigid Golden, provides teachers with guidelines, useful ideas and examples for developing resources such as board games, for teaching CC. Together, these pedagogical strengths work well in connecting various CC aspects across the curriculum.

While I appreciate the pedagogical strength of the book, I suggest that a few aspects require strengthening, to allow the book to reach its full potential as a resource for teaching CC in primary schools. These include (i) strengthening the theoretical framework and the inconsistent use of

terminology; (ii) enhancing the accuracy of the science basis of CC and (iii) some aspects related to the style of writing.

The book states at the onset that it aims to provide teachers with strategies for teaching CC across the primary curriculum. This is an epistemological claim to which the book remains committed. However, the book refrains from dealing with other critical epistemological issues, essential for supporting CC teaching. These include questions such as What is the scope of CC contents in primary education? How should CC be included in the curriculum and delivered across the year levels, in age-appropriate ways? The importance of answering these questions is paramount for supporting routine implementation at schools. For teachers to be able to teach a topic effectively, they need to have a clear idea regarding how the content is organised, sequenced and paced in an age-appropriate manner. Instead, CC epistemological inclusion in the curriculum appears fragmented, confused and inconsistent, particularly in relation to the use of terminology. Often CCE appears interchangeably with Environmental Education or Education for Sustainability, or just as a means for teaching something else, such as skills in science and geography.

The book rightfully acknowledges the important role of the science basis of CCE. However, due to this importance, further attention is required in relation to accurate use of scientific terms. Inaccurate explanations of scientific concepts may lead to misconceptions among the readers that may hinder the efficacy of teaching CC. Some examples include the following: Chapter 1 states: 'Over 30 years ago, climate change was first declared a human-generated phenomenon by NASA climatologist James Hansen' (p. 9). Here I note that Hansen was not the first to declare this. In 1886 the Swedish chemist Svante Arrhenius made the connections between coal burning and the greenhouse effect (Enzler, *n.d.*). On Page 155 it states: 'Bees are important pollinators for flowers, fruits, and vegetables'. Note that bees pollinate flowers only. They do not pollinate fruit or the market term 'vegetables'.

On Page 320, the following description appears: 'the function of the lungs / physically inhaling or taking in O₂ and exhaling (polluted air with CO₂)'. Here the exhaled carbon dioxide is referred to as 'pollution'. This incorrect concept lays the foundation for further inaccuracies, as follows: 'Everybody inhales O₂ & exhales CO₂ in this school. How can we ensure we are inhaling clean / non-polluted air?' (p. 320). After the children were taught that CO₂ is a 'pollutant' and their mere breathing pollutes the air, this sentence further suggests to children that we should inhale air without CO₂, a clearly inconceivable idea. Additionally, the text misconceives the constituents of air pollution, which are neither oxygen nor carbon dioxide. The text further states: 'Name 2 places in this country / in this area where there is normally a lot of O₂ / CO₂? How can we increase levels of O₂ in our locality / area / school yard?' (p. 320). Here again, the text presents fundamentally wrong science concepts. Evidently, gases do not stay in one place. Thus, even if the underlying idea is that children will suggest to plant trees in their school grounds to increase oxygen release and carbon capturing, this considered at the scale, will evidently have no effect on the local concentration of neither of the two gases. There will always be 'a lot' of oxygen (~21%) and very little carbon dioxide (~0.042%) in the atmosphere, wherever the children are. The question asking students to name two places in their area where there is normally a lot of O₂/CO₂ seems to present fundamental misunderstanding regarding the composition of the atmosphere and the concentration of its gases, the kinetic theory of gases and the constituents of air pollution. Overall, I suggest that meticulous attention needs to be given to presenting accurate science facts, across all levels of schooling.

Regarding the writing style, in line with the book's hands-on approach, the writing style is easy to comprehend and suitable for a wide range of educators, at various levels of their career, whether they may be pre-service teachers or in-service teachers. However, this at times comes at the expense of maintaining the academic and educational integrity of the text. Here I refer particularly to a few sections where the text takes on a manifesto style. For example, the discussion of 'the term

‘climate barbarism’ as a form of climate adaptation. This represents a marrying of white supremacist violence with vicious anti-immigrant racism. A rise of far right politics globally and stricter border controls . . .’ (p. 22). And in the same spirit, it states that ‘politicians will not gamble their political careers on climate actions unless the public call for them to do so . . . short-term political pay backs will remain more popular than long-term environmental actions’ (p. 25). In my view, these and other strong political statements and accusations undermine the academic integrity of the book and its educational purposes.

Finally, it is recommended that educators who wish to use this book as a resource for teaching, critically evaluate the affordances and limitations of the book and consider these in relation to the particular socio-cultural settings, where teaching takes place.

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Ethical Standards. Nothing to note.


Reference

Enzler, S.M. (n.d.). History of the greenhouse effect and global warming. *Lenntech*. Retrieved from [https://www.lenntech.com/greenhouse-effect/global-warming-history.htm#:~:text=Svante%20Arrhenius%20\(1859%2D1927\),result%20in%20enhanced%20global%20warming.&text=Arrhenius%20suggested%20a%20doubling%20of,5oC%20temperature%20rise](https://www.lenntech.com/greenhouse-effect/global-warming-history.htm#:~:text=Svante%20Arrhenius%20(1859%2D1927),result%20in%20enhanced%20global%20warming.&text=Arrhenius%20suggested%20a%20doubling%20of,5oC%20temperature%20rise)

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Researching early childhood education for sustainability: challenging assumptions and orthodoxies

Edited by: Sue Elliott, Eva Ärlemalm-Hagsér, and Julie Davis. Routledge, 2020, London and New York.

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Our planet is at a crisis point. Governments and policy makers are being held accountable by a mass movement to address climate change and adopt sustainable living practices. Educators have a pivotal role to play in this movement particularly in supporting today’s children to better understand sustainable practices. In among myriad declarations, policy, frameworks and academic discourse, comes a book that demonstrates the value of building young children’s understanding of sustainability. In this new, second edition of *Researching Early Childhood Education for Sustainability* (2020), the criticality of understanding and addressing humans’ impact on our planet is made clear. This book updates its first edition (Davis & Elliott, 2014) at an important juncture. It addresses themes of climate change, the Anthropocene and Indigenous ways of knowing the world and is particularly relevant as part of the broader context that has developed since