


Chapter 3

Pre-Service Teachers' Pedagogical Knowledge and Perceptions of Climate Change Education

Evelyn W. Njurai

 <https://orcid.org/0000-0001-5261-6577>
Kisii University, Kenya

Billiah Gisore

 <https://orcid.org/0000-0002-5116-7615>
Kisii University, Kenya

ABSTRACT

Climate change education (CCE) has been proposed to be a driver for the much-needed knowledge and skills on climate change (CC). Teachers, and consequently learners, are key change agents in any society; therefore, it is necessary that they have knowledge and skills on CC and how to mitigate and adapt to these changes. This chapter discusses pre-service teachers' pedagogical knowledge and perceptions of CCE. The discussion is contextualized through research conducted in Kenya. While it was evident that the pre-service teachers had basic knowledge and skills about CC, they also had misconceptions. Further, CCE was not documented in their curricula. They propose that CCE can be integrated with other subjects or implemented as a stand-alone subject or both. The study consequently identifies pre-service teachers' knowledge gaps and reports on their mixed perceptions of CCE. The need to include CCE in the curriculum is then underscored in view of targeted agencies.

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INTRODUCTION

Scientists have identified the actual and potential causes of Climate Change (CC), including its impact, mitigation, and adaptation measures in different global contexts. While these are concerns with lifelong effects, information on CC has not been embraced or understood and there are sometimes misconceptions about it (Bord, O'Connor & Fisher, 2000; Ikonomidis, Papanastasiou, Mela & Avgoloupis, 2012) by many ordinary citizens in the world. This is partly because matters of CC have commonly been addressed in the public domain through awareness fora, media, or general readership where in-depth information may not be provided. Since education systems are seen to be effective means of developing capacities for addressing CC (Stevenson, Jennifer & Whitehouse, 2017), it is necessary that CC matters should be taught through formal education which provides a platform for longer learning periods and in-depth coverage of content and concepts. Further, there is a need to mainstream CC in school curricula in order to prepare the world for uncertain climate changes (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2021b). One of the priorities of the UNESCO-led Global Action Program (GAP) on Education for Sustainable Development (ESD) is to build the capacity of educators (UNESCO, 2014) to influence how people think and act (UNESCO, 2017) on matters of global concern like climate change. Teachers, therefore, need to be equipped with the requisite knowledge and skills of and about CC and consequently Climate Change Education (CCE). The knowledge and skills are then passed on to learners who are change agents in current and future times.

This chapter discusses pre-service teachers' knowledge and perceptions on and about CC and CCE from past research. To contextualize the discussion, the chapter draws on research conducted in Kenya to assess knowledge of pre-service teachers on CC, preparation of pre-service teachers to teach CCE, suggested and appropriate pedagogies for CCE, and perceptions of pre-service teachers on CCE. The chapter finally proposes incorporating CCE into the pre-service teacher training curriculum to improve their knowledge and skills for impacting their learners.

KNOWLEDGE ON AND ABOUT CLIMATE CHANGE EDUCATION

Climate change is referred to as the variations in climate which are attributed directly or indirectly to human activities observed over a comparable period (UN, 1992). The variations alter the composition of the global atmosphere, hence affecting the natural climate. Climate change science draws from multiple subjects in schools and disciplines in tertiary education (Boon, 2016). Climate change education is consequently about teaching and learning matters of climate change. It aims to equip

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