# Note on Climate Change Education

There is strong agreement on the importance of education in society’s efforts to address the challenges of climate change. For example, in 2010 Anderson called for “*combating climate change through quality education*” (Anderson, 2010), while more recently (Reid, Dillon, Ardoin, & Ferreira, 2021) argued that “*environmental education is a cornerstone for the social and environmental change*s” needed in the future. There is however less consensus as to what form that education should take. (Reid et al., 2021) suggest that it “*is not simply a matter for scientists*” and it must involve “*the humanities, arts, and social sciences, and wider society*”. (Eilam, 2022) argues that it should “*be included in school curricula as a disciplinary-subject*”. (Rousell & Cutter-Mackenzie-Knowles, 2020) concluded their systemic review of studies on educating young people about climate change by calling for “*the development of new forms of climate change education that directly involve young people in responding to the scientific, social, ethical, and political complexities of climate change*” (p191).

(Monroe, Plate, Oxarart, Bowers, & Chaves, 2019), in their meta review of strategies for Climate Change Education (CCE), highlight that learner centred, active and inquiry-based approaches are prominent in practice and that the Knowledge Integration Framework (Linn, Davis, & Eylon, 2013; Linn & Hsi, 2000) is one useful template to follow. The framework recommends that in designing learning experiences the instructor should *“(1) make content accessible by connecting to personally relevant experiences or building on student ideas, (2) help students learn from each other by allowing them to compare ideas and debate viewpoints, (3) make thinking visible by using models, visuals, data collection and analysis, and (4) promote lifelong learning by creating an inquiry process and motivating its use” (p804).*

Microworlds are particularly suitable in addressing points (2) and (3) above. A microworld, (DiSessa, 2000), is a type of computer simulation which models a simplified, but not simplistic, version of the phenomena being studied. The learner can control a number of key variables or attributes which must be manipulated to achieve a desired outcome, with the manipulation of the artefact playing a key role in the learning process (Noss & Hoyles, 2017).

The Bridge21 pedagogical model for collaborative project and problem based learning (Lawlor J., Conneely C., Oldham E., Marshall K., & Tangney B., 2018) has been shown to be effective in promoting student self-confidence in transversal skills, student motivation and engagement with learning (Lawlor, Marshall, & Tangney, 2016; Sullivan K., Bray A., & Tangney B., 2020). It has been used to deliver curriculum content ranging from mathematics (Bray, Oldham, & Tangney, 2015) to language learning (Bauer, Devitt, & Tangney, 2015) and to scaffold STEM learning activities which use microworlds (Wickham C., Girvan C., & Tangney B., 2016). It has been used successfully in previous climate based education projects (Dolan S., 2023; Gloster Y., 2023).

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