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*Research Article*

# Environmental Education for Sustainable Human Well Being: Climate Change Education and Capacity Building

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## Abstract

The challenging threats within the continuous unpredictable weather variability and the likely consequences on human health and well-being define a real requirement of global participation for mitigation efforts based on essentially on the adoption of more responsible ethical attitude. The key of sources of these intended changes relies on education. Thus, this article introduces key features successful environmental education it points out the policy, economic and pedagogical drivers controlling organic approach in developing climate changes pedagogies.

Educational practices of Climate change education (CCE) require different senses of scope and approaches to model and build climate change adaptation capacity. The approaches require tests, evaluation and continuous research for effective education progress.

**Keywords:** ***CCE, awareness, pedagogy, higher education, scholarship.***

## I. Introduction

Climate change, as one of the major global issues threatening human well-being, human health, economic development, raises the concern about the effectiveness of the adaptation measures taken until present, and outlines the importance of continuous capacity building process or more innovative, and more efficient management actions that may conserve and secure human sustainable development and guarantee environmental justice for future generations. International governments and united unions foundations, as well as major published works concerning the likely consequences as climate variability have confirmed that the success of adaptation , and mitigation efforts depend in the efficiency of the adopted practices related to six principal key areas namely; education (pedagogy), training (formations), public awareness (culture), public access to information (self-knowledge), public participation (individual effort) and international cooperation (shared humanity experience) (Tabler &Taylor 2009; Young 2018; Monore et al. 2019; Reid 2020). All these aspects are, in fact, related principally to education and learning about climate change.

Indeed, the emergency if climate change global threats and the continuous evolution of different natural systems in unpredictable ways has defined the CCE as the main success-key for future mitigation and innovative adaptation approach. Ensuring continuous awareness about climate change variability and the likely consequences is a crucial requirement for the development of prevention fruitful strategies, relying principally on responsible, updated learning formations, based on CCE and formation education practices fit to the purpose and effective to bring out the appropriate practical skills (Tabler & Taylor 2009; Cheng 2014; Young 2018; Monore et al. 2019; Reid 2019, 2020).

In fact, climate change as a great public health well-being and safety issue, represents an international concern for which knowledge and relative information are controversial (evolution, long and short-term impacts, mitigation, and adaptation measures…). This complexity of management plans and scientific-based evidence require an equivalent social adaptation and social participation while the ambiguity related to climate change repercussions requires a socio-scientific teaching and learning (Blum 2009) aiming to investigate the way by which scientific proposition knowledge can be incorporated into opinion making for social public (Sadler 2005). Indeed, knowledge influences on attitude opinion thinking, life mode… Thus, appropriate learning is needed to face the continuum human and natural systems changes within timing challenges. Thus, CCE cannot be defined no longer as temporary formations framework pr catalogue of facts (Polanyi 2009), journeys of activities and courses, conferences but should be re-evaluated as a principal education unit of environmental learning.

The good governance plan made to mitigate the human effects in the Anthropocene begins with capacity building of public engagement of today student (citizens of the future), socio-economic issues implications climate of environmental education requires addressing the adequacy of programs communication traditional educational methodologies especially when local, national and international educational sectors are underfunded and under evaluated (Hayden et al. 2011). To adopt CCE as the key to prepare future societies for sustainable development goals of continuously changing system within the tolerant timing, these four principal objectives require promoting behavioral change, thinking capacity and making informed decisions.

Despite all these global agreements on climate change learning involvement into educational systems, the lack of substantial progress and significant revision changes on educational sector over more than two decades for almost North African countries like Tunisia has limited the capacity building for climate change adaptation and has disrespected the ethical statement liability for environmental justice for future generations. Thus, the present paper aims regarding these issues of environmental education to highlight the importance of the reevaluation of the trade educational methodologies in northern Africa, one of the most vulnerable areas to climate change. It attempts to evaluate the required changes to incorporate CCE as social-scientific reflexibility reasoning and adaptation patterns.

## II. Climate change impacts on education

Increasing temperature, changing rainfall patterns, frequent extreme events … and the different aspects of climate change have great potential of influences on education and learning justices. Indeed, the role of climate change in exacerbating the existence societal and economic inequity will impact the capability to implant adaptation and mitigation measures. Droughts and floods frequency will impact the equity of learning between students who are able to be present or to take virtually their courses and formations and those for neither school nor online platform was accessible and the examples are numerous especially during the last two years. In Tunisia for example, the highly rainy periods o December-February during these years inhibit the low-income families to send their Childs to school. More than three dead from kids at primary schools have been announced. These kids who have to deal in normal conditions with more than 7 to 8 km to make the way to school daily have to make access through different geomorphologic features (mountains, Collins, river, vast depressions…).

At the other extreme conditions, the frequent drought periods of southern Tunisia characterized by the highest temperature values exceeding 49 to 50°C during summer and spring periods especially in SW Tunisia constraint the access to school in these areas. Frequent irregular, individual or with group disturbance define injustice to access to learning and consequently, injustice for evaluation.

These limiting impacts on learning will inhibit the ability of students to create to innovate to participate on climate change mitigation efforts or at least to be aware from all these emerging issues. Education as a key tool influence the large-scale behavior changes required during these transit stages equilibrate the driving sectors within eco-friendly development strategies. Despite the ethical requirements and scientific-based evidences, the lack of consensus to what environmental education for sustainable development should look like and what are the main steps to take to implant new pedagogic strategies are commonly concerns for developing and developed countries from less prone to the highly vulnerable regions.

In contrast with large potential effects of climate change on education sector inappropriate political and educational preparedness present significant challenges to large scale educational, economic and environmental improvements that can help communities mitigates and adopt to climate change local officials superintendents while increasing environmental awareness is dependent on education, countries are not including educational systems in national priorities from climate change mitigation, climate smart education investments is a priority.

## III. CCE on primary education

Unfortunately, the actual development strategies are evaluated after the emergent environmental issues and their socio-economic repercussions. They are often evaluated after the cumulative even irreversible impacts explaining a hard task of management and a high degree of uncertainty related to the effectiveness and appropriateness of the adopted rehabilitation measures. These commonly observed situation are the consequences of a large gap about environmentally related beliefs, attitudes and behaviors (Kollmuss and Agyeman 2002; Marcinkowski and Reid 2019; Reid 2020).

Climate change challenge represents the good example for this human paradox. In spite of the important issue related to climate change on human health, well-being and sustainable existence, the public awareness of concerning climate change is still limited. Ambiguous characterization and partial understanding of the key processes related to this global issue result in inefficient social involvement or even inappropriate practices. Thus, education of climate change aspects, scientific based learning of the causal links between human development natural systems modification is a necessary to draw the scientific knowledge on a way of thinking and behavior.

In fact, this early education may reduce largely the social perception, the information diffused from media often characterized by incomplete or seemingly contradictory knowledge erroneous explication intermediate scope, multiple unjustified explanation and contested opinions regarding climate issues. Thus, CCE at primary and secondary schools with gradual formations provide students as mathematics, literature, language and any education unit to authoritative source and promote the knowledge and information as a component of total learning.

With the same pedagogic goals, environmental education brings about a fundamental shift in thinking and attitude toward the planet at a principal pedagogic unit at primary and secondary schools begins with clear scientific definitions of terms, complex patterns of climate change and going to bring effective utilization of education opportunities on brain development of young children to create new solution and tools approaches on behalf all the previously ineffective solution. This unlimited potential for human development should be redirected guided to achieve sustainable development goals reduce the unfruitful management approaches within unknown undefined climate chaos (Jickling 2013; Verlie 2019).

Continuous gradual formation of young students on environmental management of climate change challenges leads to developing learners enabled to engage news information about this issue and to take action in the right time as emphatic individual innovative and creative persons. CCE is, furthermore, a required intergeneration ethics, that addresses people's rights to be free of

oppression due to climate change injustices sustainable equity, life development.

As a dynamic issue, with unpredictable evolution and unclear repercussions, climate change requires an instantaneous reflection ability and continuously modified management projects, non-hesitation decision makers and responsible citizens. All these features cannot be considered for short-time formation, journeys of awareness. They require robust knowledge, continuous formations not as a complement any modules but as an essential unit. The interdisciplinary global, challenges of climate change confirm in addition that this educational unit is required whatever for all the designed section. CCE with the new revised pedagogic approach should be continuous fundamental educational unit.

*"You can't change these things with laws you must change people's minds and you have to give people something than as meaningful as what they've lost" (Quinn 1992).*

## IV. CCE at higher education

The involvement of environmental education into the different sectors and disciplines of higher education has becoming an emergency. In fact, this contribute is defined precisely as the short-term adaptation measures of the educational system. The higher education, as the last step for learning after which the today-student will be effective citizens and decision maker at the near future, is a transit state requiring effective management to promote fruitful behavior changes and environmental respectful attitude.

Indeed, to grasp some issues of the causal drivers and the evolution dynamic hard task to integrate the complexity understanding with the complexity of social response to climate change. Unfortunately, until present, there is still a relative denial phase regarding the role of human development in the anthropocene. Thus, local and individual responsibility to mitigate climate impacts is not yet clearly understood.

So, to promote a participative citizenship, besides to scientific knowledge, technical performance and engineering aspects, the development of persons who able to make decisions, to participate, to be engaged in public debates, to communicate and to integrate learning background into daily attitude and especially to think with a great aptitude of reflexibility and continuous development progress is the principal objectives of CCE integration at higher education.

Indeed, at this level of responsibility and maturity, even students are capable to evaluate the good education practices for their specified learning formation, there are significant effects of psychological, human evolution and socio-economic processes (Brownlee et al. 2013). Thus, the environmental education along with their specific objectives in the different future sectors and for their different future positions will grow through the promotion of increasing attention to human aspects of the natural anthropogenic modified system which will enhances the development of innovative capacity building approaches different with respect to the sector of development, research and the social background. CCE at higher institutions as a permanent part of scientific knowledge expresses in an exhaustive way the established links between the role of the different development sectors (Medicine, industry, sciences, engineering, literature, languages, teaching, economy, law …) and the addressed climate change consequences and repercussions on human well-being and for sustainable human existence.

This introduction of CCE at this level, inconsistent with previously introduced education system at primary and secondary level which is based on the scientific knowledge of the aspects and processes related to climate change variability and human responsibility is based on helping them how to tech yourself on teaching them something without correct incorrect answers and clear evolution trend. CCE at higher level aims principally to make students capable to think, to discuss to give coherent argumentation, to create new ways for answering question, new tools to deal with issues so to innovate and to respond instantaneously, to be able to lake decision with pre-defined timing constraints. This variety of individual, local, and regional attitudes and measures of adaptation will define large spectrum of management actions and guarantee the possibility of choice within hierarchical classification (Macrow 2010).

The CCE, as a part of ecological formations in a way to rectify long term gap in education system and environmental responsibility explains the interlinked connection of both socio-economic and ecological sustainability. The relatedness which is often evaluate a posteriori when the extreme limits of tolerance of the different ecological services and environmental components were exceeded, should be re-evaluated as a principal component of sustainable human development. CCE is the way to show that ECO-ECO parts are of equal importance for human well-being. The introduction of CCE based on scientific evidence defines different hypothesizes happening in distinct situations and different sectors for future citizens. It provides, consequently, students with practical skills needed to fulfill the requirements of their ambitions with respect from their different positions to the healthy ecological functioning (smart agriculture, reuse of waste water, renewable energy, appropriate techniques, adaptation attitude at different levels…) deepening on the unpredictable evolution trend. This education brings future reflection within specific timing and immediate actions. CCE defines, correspondingly, the required flexible management attitude (respect, rethink and react).

## V. Conclusions

Given the huge challenging threats of human well-being a sustainable economic development, CCE constitutes an urgent anchoring of understanding climate change on scientific concepts and the relative social conceptualization. It is a fundamental step for enhancing social student engagement for more adaptive and innovative approaches. It is considered the most effective approach for increasing reliably the likely success of management for sustainable human well-being.

Indeed, CCE represents an example of ethical responsibilities relative to equity in learning and in management for global ecological justice based on interdisciplinary cooperation. It strengths the capacity building effort for climate change adaptation and reduces the time lost for knowing at critical state by direct actions after fulfillment of the deficit on scientific understanding of the different factors, processes and evolutionary proprieties of this issues. The socialized student formation combines the scientific based learning to social and individual behavior and attitude management.

The involvement of educational system, social actions ,development theory and economic and political management as a n inquiry incorporating learning, communication, activities, initiatives, trails and regulation define a new pedagogical tools and methods expressing the complexity of ecological issues the uncertainty of natural system evolution an d the vulnerability of human health and well-being and the sustainability of eco-social development all these instable features require an education

 

revolution, flexible, individual cooperative and responsible CCE as a learning process aiming to raise eth ambitious, the communication and the thinking ability of students by defining new valid indicators of success related to ecological sustainability within continuous development without tests and exams.

## Declarations

## Data availability

The datasets used for this study are available from the corresponding author on reasonable request.

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## Conflict of interest

The authors declare no conflict of interest

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