Print ISSN: 2791-2248
Online ISSN: 2791-2256
مَجلّةُ تَسْنِيمِ الدَوليّة
للعُلومِ الإنسانيّةِ والاجتمَاعيّةِ والقانونيّةِ

العدد العاشر – أيلول – 2024 / September –

The recommendations of using incorporating climate change issues into educational curricula

Assel Amer Hadi[1], Nada Allawi Fadhil[2], Hanan Kareem Saleem[3], Nadia Mahmoud Tawfiq Jebril[4*], Sarah Hussein Hamzah[4], Lina Mahmoud Tawfiq Jebril[5]

[1]Department of Biochemistry, College of Sciences, Al-Mustaqbal University, Babylon, Iraq.

[2]Babylon Technical institute, Al Furat Al Awsat Technical University.

[3]Department of Community Health, Karbala Technical Institute, Al Furat Al Awsat Technical University.

[4]Department of Biology, College of Science for women, University of Babylon.

[4]Civil Engineering , Altinbas University, Istanbul, Turkey.

*Corrsponding author's e-mail address:
nadia.tawfiq@uobabylon.edu.iq

Abstract. Climate change represented by an increase in the average temperature beyond 1.5°C is a global problem in nature, so this topic must be engaged in interpretation as part of instruction and exploration in educational curricula (educational institutions and universities). Climate change education (CCE) is a critical retort to this issue. The 2020 Global Education Monitoring Report by UNESCO accentuates the impression of instruction on both environment modification vindication and revision, but despite this,

Print ISSN: 2791-2248
Online ISSN: 2791-2256
مَجلّةُ تَسْنِيمِ الدَوليّة
للعُلومِ الإنسانيّةِ والاجتمَاعيّةِ والقانونيّةِ

numerous nations do not distinguish the standing of climate change education and do not invest significantly in it. Therefore, this review highlights the role of environment transformation tutoring in the education sector and provides solutions to the challenge of expanding climate change education by giving examples of how this can be integrated into every discipline in graduate school and academies.

Keywords: Climate change, Climate change education (CCE), curriculum, universities.

الملخص

يمثل تغير المناخ المتمثل في زيادة متوسط درجة الحرارة إلى ما بعد 1.5 درجة مئوية مشكلة عالمية بطبيعتها ، لذلك من المهم أن يؤخذ هذا الموضوع في الاعتبار كجزء من التدريس والبحث في المناهج التعليمية (المؤسسات التعليمية والجامعات). يعد التثقيف في مجال تغير المناخ (Climate change education (CCE) أستجابة حاسمة لهذا التحدي. يؤكد تقرير اليونسكو عام 2020 على تأثير التعليم على كل من التخفيف من آثار تغير المناخ والتكيف معه ، ولكن بالاضافة لهذا التغيير ، فإن أغلب الدول لا تدرك أهمية التثقيف بشأن تغير المناخ ولا تستثمر بشكل كبير فيه. لذلك ، يسلط هذا الاستعراض الضوء على دور التثقيف في مجال تغير المناخ في قطاع التعليم ويقدم حلولاً لتحدي التوسع في التعليم المتعلق بتغير المناخ من خلال إعطاء أمثلة عن كيفية دمج هذا في كل تخصص في المدارس والجامعات.

الكلمات المفتاحية: تغير المناخ ، تعليم تغير المناخ (CCE) ، مناهج ، جامعات.

1. Introduction

The technical civic has completed clear the pressing requirement to diminish environmental variation. The worldwide civic has officially agreed to determined vindication targets with its endorsement of the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC), which situations that reheating must be imperfect to 'well below' 2 °C and efforts must be made to limit it to 1.5°C (United Nations Framework Convention on Climate Change, UNFCCC [1]. Nevertheless, there remains a gigantic 'emissions gap' amongst the ambitious areas of the Paris Agreement and the realistic commitments and activities of its party states (Figure 1). At this time, it is claimed that concluding the release hole container only be reached if

Print ISSN: 2791-2248
Online ISSN: 2791-2256
مَجلّةُ تَسْنِيمِ الدَولِيّة
للعُلومِ الإنسانيّةِ والاجتمَاعيّةِ والقانونيّةِ

a likewise varied 'learning gap' among systematic and social empathetic of environment modification is similarly bridged. In other words, attempting environment modification successfully will necessitate the transference and practice of information - that is, edification, which empowers conversant managers and exploits at all stages in culture.

In this background, edification includes the numerous conducts through which information and dexterity are relocated from one individual to more. This contains proper main, minor, academic, and mature teaching; specialized expansion; employee exercise; and erudition over casual resources (*i.e.* through social and community involvements).

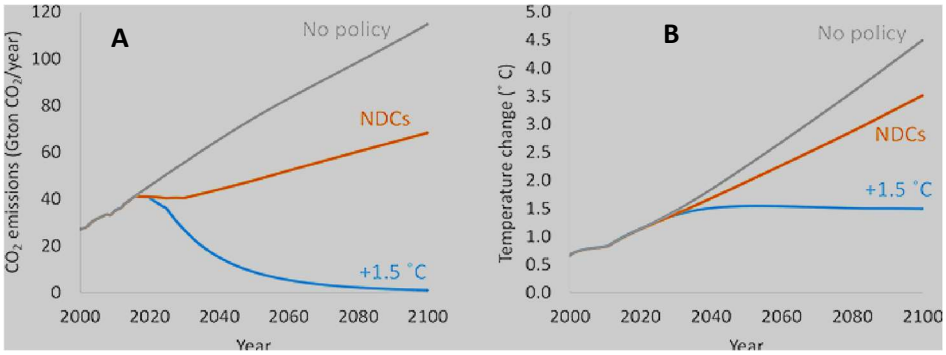

Figure 1. (A) CO_2 emissions and (B) temperature outcomes in proportion to not at all main environment modification vindication rules, Nationally Determined Contributions (NDCs) vowed underneath the Paris Contract; preventive heating to 1.5°C overhead pre-industrial periods productions pathways and results were produced using the C-ROADS Climate Change Policy Simulator [2].

NGOs can motivate rapid collaborations with governments to implement climate change education (CCE) [4]. Education at any institution partially for large and practical laboratories such as universities is an important strategy to increase the communal “carbon brain print” by edification acquaintance and assistance in the extent of carbon impartial performance and secondly to

diminish their precise “carbon footprint” by targeting for net-zero discharges of establishment- conservatory gasses [4].

Additionally, the alleyway for environment-motivated edification is integrative, premeditated, and gradually entrenches the Sustainable Development Goals (SDGs) [5], [6]. SDG 13-climate action is one of the UN SDGs that is used in describing the metrics of universities, "Times Higher Education Impact Rankings". This measurement seeks if academies achieve investigation on environment transformation, the uses of low-carbon vigor, or their programs designed at the attainment of carbon noninvolvement. The up-to-date incline of impact ranking for 2022 shows universities of Western Sydney University, Arizona State University, Western University, King Abdulaziz University, and Universiti Sains Malaysia are the five top on the list. In this review, the emergence of education in different sectors was outlined especially for girls. Finally, the recommendations of using applied programs of incorporating climate change issues into educational curricula, especially for girls were suggested to be applied in Iraq.

2. Role of Education in Addressing Environment Modification

There is a need to integrate temperature modification teaching across various disciplines. People must be aware of climate change regarding its weather knowledge, policy, law, ethos, sociology, finances, and culture to challenge climate change and improve environmental protection. This awareness can be cultivated among children, education investors, policymakers, researchers, and occupational leaders [7]. The CCE focuses on various strategies, including: (1) Supporting the incorporation of CCE in the curriculum across primary/secondary schools and higher education, through a broad range of subjects; (2) Supporting the development of discipline, knowledge, engineering, and arithmetic programs to build national and local capacity on CCE; and (3) Ensuring that advanced edification and mechanical and occupational edification and teaching involvements provide the necessary data and assistance related to environment and climate change.

However, these strategies require the construction of sustainable schools/universities, which could involve: (1) Developing a new education framework; (2) Implementing sustainable designs with more effective renewable energy and insulation; and (3) Promoting environmental health in

Print ISSN: 2791-2248
Online ISSN: 2791-2256
مَجلّةُ تَسْنِيمِ الدَولِيّة
للعُلومِ الإنسانيّةِ والاجتمَاعيّةِ والقانونيّةِ

education facilities, such as providing access to clean water and ensuring safe and gender-separated hygiene facilities..

3. Challenges to applying CCE at the defendants academies

It is important to identify the contests and chauffeurs to execute CCE to overcome them. Recently, a study by [8] found that the lack of funding for CCE and staff expertise was the most challenging. In addition to the absence of formal provision, developments on environment modification, materials/resources, legislative initiatives/requirements, and staff/student interest.

4. The supposed foremost melodies for preparation requirements in terms of CCE at campuses

As the challenges stated above and defined, therefore different supposed foremost melodies for preparation needs in terms of CCE at academies. It is stated that seven major themes are: courses, curriculum, staff, research, programs, partnership, and workshops. Based on the study [8] (Figure 2) found that courses and curriculum are the momentous requirements in terms of CCE at academies.

5. Examples of developing CCE at universities

Different universities have developed various strategies to incorporate CCE in teaching courses and research programs. In teaching courses, the most suitable way is to include one prospectus at a single from three stages of education. On the other hand, within research programs, dissimilar research plans that produce graduate thesis deals with climate change. In addition, different academic activities raised the awareness of climate change such as organizing conferences/workshops.

Print ISSN: 2791-2248
Online ISSN: 2791-2256
مَجلّةُ تَسْنِيمِ الدَولِيّة
للعُلومِ الإنسانيّةِ والاجتمَاعيّةِ والقانونيّةِ

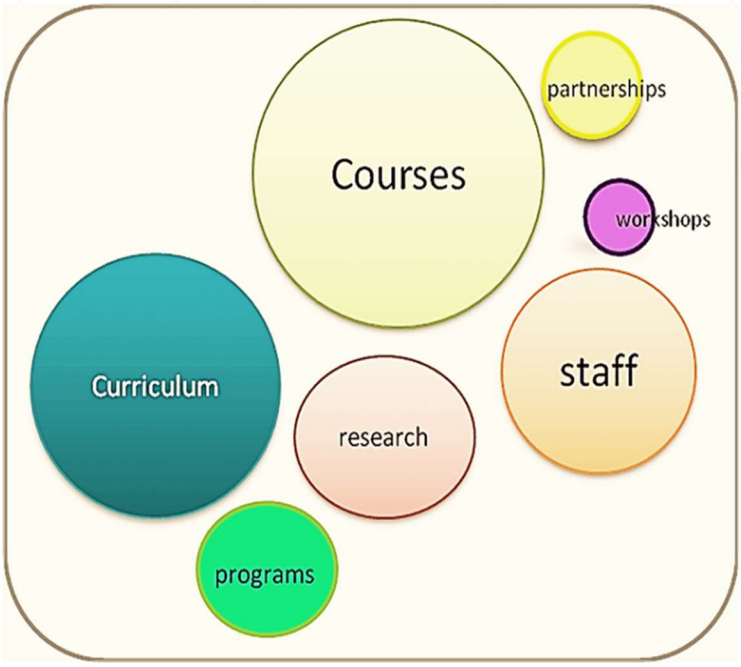

Figure 2. The supposed foremost melodies for preparation requirements in terms of CCE at campuses.

6. Examples of developing CCE at KTH Royal Institute of Technology

KTH conducts research and education in engineering and technology and is Sweden's largest technical university. KTH Royal Institute of Technology has developed different strategies of CCE in December 2019 for 2020-2045, that help to decrease climate impact and ensure their contribution to the achievement of society's goals. KTH Royal Institute of Technology planned programs that at all three levels of undergraduate courses, sustainable development and climate transformation included in their educational programs. These subjects such as Topographical Climatology; Climate changes; Worldwide Environmental science and Climate Change, in addition to the effects of climate change on plants, investigation of climate changes, and to examine at global scale the planet's system, forecasting, and sympathetic environmental changes [9]. In addition, the campus established the Center for Meteorological and Climate Research Applied to Agriculture (CEPAGRI) in

1983, which focuses on studying climate change and conducting investigations on agroclimatology, agrometeorology, ecophysiology, and geotechnologies [10].

7. An action plan to implement the integration of climate change issues into educational curricula in Iraq

We can overcome climate change by implementing climate change education in different educational sectors. We notice the difference between Iraq and other developed countries in response to climate change, but we need to conduct studies that show what kind of subject matter, courses and research are already available now in the educational sectors and analyze what the gap is.

We may be too late to catch up with developed countries. In response to climate change, the university must do more about sustainability. When we talk about inclusion in the curriculum, we think of the formal curriculum, but actually we have three other possible educational methods: first, the formal curriculum, second, the informal, and third, the subliminal.

The formal university curriculum consisting of student lectures, tutorials, and seminars; A type of educational learning test. For example [11], taught mathematics at the University of Chester, and in this lesson students are able to make connections between sustainability and mathematics to support sustainability progress such as looking at climate change data and using mathematical modelling of weather patterns, biodiversity and evolution.

The informal approach often occurs with the Student Union, Student Union or Student Skills and doing an activity such as going to Green Week.

A final example is the subconscious curriculum which is often described as a attended curriculum and this is where students can see the culture and values of the institution and often learn from it. It could be something like camping going on in the institution, and how well the staff deliver.

8. Conclusion

We need to bridge the learning gap' between scientific and societal understanding of climate change that enables informed decision-making and action at all levels in society; and that excludes education This education sector includes formal primary, secondary, university, and adult education; professional development; worker training; and learning through informal means (*i.e.* through cultural and social experiences). NGOs can motivate rapid collaborations with governments to implement climate change education [12].

Print ISSN: 2791-2248
Online ISSN: 2791-2256
مَجلّةُ تَسنِيمِ الدَوليّة
للعُلومِ الإنسانيّةِ والاجتمَاعيّةِ والقانونيّةِ

We can beat climate change with applying climate change education at different educational sectors. We notice the difference between Iraq and other developed countries in response to the climate change, but we need to do studies showing what kind of subject, courses, research that are really available now in the educational sectors and analyzing what the gap is.

References

[1] UNESCO (2012). Climate Change Education for Sustainable Development in Small Island Developing States: Report and Recommendations. http://unesdoc.unesco.org/images/0021/002164/216473e.pdf, p. 27.

[2] Sterman, J., Fiddaman, T., Franck, T. R., Jones, A., McCauley, S., Rice, P., ... & Siegel, L. (2012). Climate interactive: the C-ROADS climate policy model.

[3] Hallgarten, J., Gorgen, K., & Sims, K. (2020). Overview of emerging country-level response to providing education continuity under Covid-19: What are the lessons learned from supporting education in conflicts and emergencies that could be relevant for EdTechrelated responses to Covid-19? Education Development Trust. Retrieved from: https://edtechhub.org/wp-content/uploads/2020/05/supporting-education-conflict.pdf

[4] Baumber A, Luetz JM, Metternicht G (2019) Carbon neutral education: Reducing carbon footprint and expanding carbon brainprint. In:

[5] Filho WL, Shiel C, Paço A (2015) Integrative approaches to environmental sustainability at universities: an overview of challenges and priorities. J Integr Environ Sci 12(1):1–14

[6] UNDESA (2020) A decade of action to deliver the SDGs. https://www.un.org/development/desa/dspd/2020/09/decade-of-action/

[7] UNESCO (2012). Climate Change Education for Sustainable Development in Small Island Developing States: Report and Recommendations. http://unesdoc.unesco.org/images/0021/002164/216473e.pdf, p. 27

[8] Leal Filho, Walter, Mihaela Sima, Ayyoob Sharifi, Johannes M. Luetz, Amanda Lange Salvia, Mark Mifsud, Felicia Motunrayo Olooto et al. "Handling climate change education at universities: an overview." Environmental Sciences Europe 33 (2021): 1-19.

[9] KTH (2021) KTH's Climate objectives and measures. https://www.kth.se/en/om/miljo-hallbar-utveckling/klimatramverk/kth-s-klimatmal-1.926003.
[10] CEPAGRI (2021) About CEPAGRI. https://www.cpa.unicamp.br/. Accessed Mar 2024.
[11] Shi Z., She Z., Chiu Y.h., Qin S., Zhang L., (2021). Assessment and improvement analysis ofeconomic production, water pollution, and sewage treatment efficiency in China, Socioecon. Plann. Sci. 74: 100956 .
[12] Chan, S., Weitz, N., Persson, Å., & Trimmer, C. (2018). SDG 12: responsible consumption and production. A Review of Research Needs. Technical annex to the Formas report Forskning för Agenda, 2030.rsity.