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NEEDS ASSESSMENT OF TEACHERS' CLIMATE CHANGE INFORMATION AND MITIGATION COMPETENCIES IN CROSS RIVER STATE

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Abstract
The study investigated climate change information and mitigation competency needs of teachers in Senior Secondary schools in Cross River State, the influence of qualification on climate change information and mitigation competency needs of teachers in Cross River State, influence of gender on climate change information and mitigation needs of teachers in Cross River State, the influence of location on teachers climate change information and mitigation competency needs in Cross River State. With eight (8) specific purposes, eight (8) research questions and six (6) corresponding null hypotheses were generated for the study. The study adopted descriptive survey research design. The population of the study comprised 220 geography teachers (74 males and 45 females) Geography teacher in the two education zone sample of 60 Geography teachers was drawn using multi-stage sampling procedure for the study. one instruments titled climate change information competency needs Questionnaire (CTCCIMCNQ)" and climate change mitigation competency needs (NATTCCIMCQ) were developed by the researcher for data collection. The instruments were validated by three experts. Cronbach alpha technique was used to establish the internal consistency of the instrument with a value of 0.915. Data collected were analyzed using mean(X) and standard deviations to answer the research questions while Analysis of variance (ANOVA) was used to test all the null hypotheses at 0.05 level of significance. The findings of the study among others showed that climate change information competency and mitigation needs of the teachers varies according to qualification it was recommended among others that the climate change unit in federal ministry of environment should provide timely information on climate change to teachers in Cross River State to enable them pre-empt adverse climatic and environmental effect within the area, it was also suggested that enlightenment programmes such as seminars and workshops be organized by climate change unit in ministry of environment on information and mitigation to climate change for teachers in Cross River State Nigeria.

Keywords: Assessment, needs, climate change, information, mitigation, competency

Introduction

Needs assessment is a strategic planning tool, often used for improvement in individuals and problem solving which however set a stage for needs assessment periodically, learning objectives are usually based on recognized needs. Needs assessment help teachers to know that as the most significant resources in schools, he is critical to raising the education standards, improving the efficiency and equity of schooling depends, in large measure, on ensuring that the teachers is highly skilled, well resourced, and motivated to perform at his best raising teaching performance is perhaps the policy direction most likely to lead to substantial gains in student learning in turn. The effective needs assessment of teaching is central to the continuous improvement of the effectiveness of teaching in a school. It is essential to know the strengths of teachers and those aspects of their practice which could

be further developed, from this perspective, the institution of teacher need assessment is a vital step in the drive to improve the effectiveness of teaching and learning and raise educational standards and knowing the strength and weaknesses of teachers in the transmission of especially climate change knowledge in the class.

Climate change is any significant alteration in the state of the climate that can be recognized by changes in the mean or the changeability of its properties (Intergovernmental Panel on Climate Change, IPCC, 2013). In other words, it is the change in climate over a long period of time. Climate change encompasses changes in one or more climate variables such as wind, precipitation, temperature and sunshine. This change is not only due to natural variability but also as a result of anthropogenic activities. Climate change affects the social and environmental determinants of health such as clean air, safe drinking water, sufficient food and secure shelter. By the late twenty-first century, climate change is likely to increase the frequency and intensity of drought at global scale. The increase of temperature and variable precipitation decrease food production and increase the prevalence of malnutrition and under nutrition (World Health Organization, 2018). In Cross River State for example, desertification is seriously progressing southwards and the submergence of the 853 kilometers stretch of seashore along the Atlantic Ocean has destroyed farmlands, plants, animals, buildings and displaced many settlements. Cross River State is particularly susceptible to the effects of climate change in many aspects which are but not limited to the following; its systems of agriculture, soils, energy needs, economic organization, geographic location, weather and climate, population and settlement, vegetation cover, high level of temperature, poor and low national income level, absence of early warning system, poor and low adaptation capacity (Akinbobola, Adedokun, & Nwosa, 2015). Cross River State is also particularly susceptible to changes in climate because a huge share of its economy is dependent on natural resources that are climate sensitive which also tend to affect the education sector with consequences on teacher' health competence (FGN, 2017). Competent teachers are expected to possess the skills and knowledge required in the lesson delivery to students. Accordingly, Alade as cited in Onyilo and Shamo (2017), professional competence has to do with how to teach. It implies that any teacher who knows how to teach effectively is said to possess professional competence. Before going into the teaching profession, teachers must have a period of internship during which he is trained in the techniques of teaching under an experienced professional. The implication that can be drawn from the aforementioned is that professional competence involves teachers' practical experience and expertise in the act of preparing, planning and presenting lessons in the classroom and goes beyond the education received by the teachers in school and colleges.

Teacher competence is classified into four areas, pedagogical competence, personal competence, professional competence and social competence. (Kementerian Pendidikan Nasional, TCT, in 2015). Pedagogical competence is the ability of teachers to understand the learners and manage learning. Personal competence related to the personality of the teacher who is confident, stable, mature, wise and dignified, and has a work ethic and a high sense of responsibility. Professional competence can be judged from the mastery of the strategies, materials, and subject matter content and curriculum in use. The National Curriculum Board of Nigeria stipulates that climate change will be taught as part of the science curriculum from primary to secondary school level. At these levels, effective communication of climate change information is important not only to ensure that individuals understand the impacts of climate change but also to encourage action for climate change mitigation. For example, many countries around the world have set

ambitious targets for reduction in greenhouse gas emissions. This responsibility for reduction in greenhouse gas emission can be achieved through the competent effort of teachers in the class room to educate his students about the dangers of climate change and ways to mitigate it through environmental education. Moreover, climate change and its perception, information competency and mitigation are witnessed differently over space. One worries if the teachers are well informed of the causes, impacts of climate change (Wynes and Nicholas, 2017). This justifies and requires an inquiry into needs assessment of teacher's climate change information competency and mitigation in Cross River State Nigeria.

Purpose of the Study

The general purpose of this study is to carry out a needs assessment of teachers` climate change information and mitigation competences in Cross River State, Nigeria. Specifically, the study determined the:

1. Teachers` climate change information competency needs in River State Nigeria;
2. Teacher's climate change mitigation competency needs in Cross River State Nigeria.
3. The influence of educational qualification on teachers` climate change information competency needs in Cross River State Nigeria.
4. Influence of educational qualification on teacher's climate change mitigation competence Cross River State Nigeria.

Research Questions

The following questions are posed to guide the study.

1. What are the teachers' climate change information competency needs in Cross River State?
2. What are the teachers' climate change mitigation competency needs in Cross River State?
3. What is the influence of educational qualification on teachers' climate change information competency needs in Cross River State?
4. What is the influence is the influence of educational qualification on teachers' climate change mitigation needs in Cross River State?

Hypotheses

The following hypotheses were formulated to guide the study at 0.05 level of significance.

H_{O1}: There is no significant difference in the mean (x) ratings of teacher's climate change information competencies needs based on qualification in Cross River State

H_{O2}: There is no significant difference in the mean (x) ratings of teachers climate change mitigation competency needs based on qualification in Cross River State.

Methods

The study adopted the descriptive survey research design. This design is appropriate for examining phenomena as they exist in the present and focuses on establishing facts about a given population. It does not manipulate variables but rather seeks to describe them in relation to the population under study. As defined by Nworgu (2015), a descriptive survey involves collecting and systematically describing characteristics, features, or facts about a given population. This design was deemed suitable for the present study, which aimed to collect data on the needs assessment of teachers' climate change information competency and mitigation in Cross River State at the time the research was conducted. The study was

conducted in Cross River State, one of the six states in Nigeria's South-South geopolitical zone. The state is named after River Oyono, which runs through many of its towns. Cross River shares boundaries with Benue State to the north, the Republic of Cameroon to the east, Akwa Ibom and Abia States to the south, and Ebonyi State to the west. Geographically, the state lies between Latitude 3°S and Longitude 8°4'51"E. It is characterized by major rivers such as Ayah and Oloko, and its glacial landscape supports the cultivation of arable crops such as rice and beans, with fishing activities playing a secondary role due to the residents' predominant interest in farming. The population for the study comprised all 220 senior secondary school teachers working in government-owned secondary schools within the Ogoja Educational Zone of Cross River State. The same teacher population, covering about 80 schools, was reported by the Research and Statistics Department of the Cross River State Ministry of Education. A total of 80 geography teachers were selected as the sample for the study using stratified random sampling across the three education zones in the state. This sample size is supported by the guidelines of Cohen, Mannion, and Morrison (2018), who recommend an appropriate sample size for a population of approximately 70 at a 95% confidence interval.

The instrument for data collection was a structured questionnaire administered to the teachers. The questionnaire was divided into two sections. Section A gathered demographic information, while Section B was grouped into two clusters: Cluster A assessed climate change information competency needs of teachers, and Cluster B assessed climate change mitigation competency needs. Responses were rated using a four-point scale with the following options: "highly needed" (4 points), "needed" (3 points), "moderately needed" (2 points), and "not needed" (1 point). For negatively worded items, the scoring was reversed to maintain consistency. To establish the validity of the instrument, the initial draft of the questionnaire was reviewed by three experts, two from the Department of Social Science Education (Geographical and Environmental Education) and one from the Department of Science Education (Measurement and Evaluation), all at the University of Nigeria, Nsukka. The experts were provided with the research objectives, questions, and hypotheses to guide their review. Their suggestions were incorporated into the final draft of the questionnaire to ensure clarity, simplicity, item relevance, and suitability of format. The reliability of the instrument was determined through a trial test involving 20 teachers from government-owned secondary schools in Yala Local Government Area of Cross River State, which was not included in the main study. The Cronbach's Coefficient Alpha method was used to determine internal consistency because the questionnaire items were polychotomously scored. The reliability coefficients obtained were 0.915 for climate change information competency needs and 0.935 for climate change mitigation competency needs, indicating a high level of internal consistency. Data collected from the study were analyzed using both mean and standard deviation to answer the research questions, while hypotheses were tested using one-way analysis of variance (ANOVA). The ANOVA technique was deemed appropriate given that the independent variables—such as gender, teacher qualification, and school location were categorical with two levels each. Hypotheses were tested at the 0.05 level of significance. The decision rule was to reject the null hypothesis if the p-value associated with the F-statistic was less than 0.05; otherwise, the null hypothesis was retained.

Results

Research question 1: What are teachers' climate change information competency needs in Cross River State ?

Table 1: Mean (x) Response of teachers on their Climate change information competency needs in Cross River State, Nigeria?

S/N	ITEM STATEMENT	X	SD
1.	Furnishing students with information on how carbon-dioxide emission affects climate from text books.	3.68	.725
2.	Establishing a connection between climate change information from television and its effect cause by human activities	3.60	.741
3.	Getting climate change information from internet and teach my students effectively	3.53	.700
4.	Teaching any climate change related knowledge in school	3.18	.701
5.	Sourcing information on climate change from newspaper and magazines	3.15	.606
6.	Using the radio to spread climate change information to the students	3.12	.640
7.	Sourcing information related to climate change from my text books	3.20	.684
8.	Engaging students on discussion with the intent of exposing them to climate change.	3.18	.748
9.	Attending seminars to get more information about climate change	3.10	.796
10	Attending conferences exposed me to climate change information	3.08	.829
11.	Discussing climate change from the major changes within the environment	3.08	.829
12.	Tracing climate change from the major activities of man	3.02	.770
13	Explaining climate change as the earth gets hotter	3.48	. 748
14	Teaching about climate change as flooding activities experience within the earth	3.53	. 676
15	Teaching about climate change as flooding activities experience within the earth	3.42	. 619
16.	Sensitizing people about the effect of climate change as some of our tap water have become unsaved for drinking	3.22	.613
17	Explaining to people as more people get skin cancer because of high rays of the sun due to climate change	3.10	. 656
18.	Explaining how carbon-dioxide emissions affect global climate Change	3.05	.675
19.	Explaining how too much sun ray get to the earth	3.17	.668
20.	Explaining how too much ozone layer depletion is cause by climate change.	3.25	.751
	Grand mean	**3.26**	**0.70**

Table 1 above shows the mean (x) rating of climate change information competency needs of teachers in Cross River state Nigeria. Items 1,2,3,4,5,6,7,8,9,10, 11,12,13,14,15,16,17,18,19,20 respectively. These mean (x) values are above the bench

mark value of 2.50 set for decision making hence Needed. This shows that climate change information competency is highly needed by the teachers in Cross River State.

Research question 2: What are the teachers competency needs for mitigating the effects of climate change based on qualification in Cross River State?

Table 2: Mean (x) Response of **teachers on their competency needs for mitigating the effects of climate change in Cross River State?**

S/N	ITEM STATEMENT	X	SD
1	Teaching students on how to effectively use nuclear power stations instead of coal power stations that contribute to climate change	3.50	.624
2.	Explaining to students sufficiently how eating healthy foods can be of benefit to reducing climate change effect.	3.42	.720
3.	Explaining to students convincingly how keeping beaches clean can reduce the effect of climate change	3.40	.669
4.	Teaching students effectively how using unleaded petrol can reduce the effect of climate change	3.25	.704
5.	Explaining to students sufficiently how reducing the number of atomic bombs in the world can reduce the effect of climate change	3.17	.587
6.	Teaching students effectively about planting more trees in the environment can reduce climate change	3.20	.684
7.	Explaining convincingly how making our electricity from wind, waves and tides can reduce the effect of climate change.	3.25	.654
8.	Teaching students effectively how using recycled paper more can reduce the effect of climate change	3.23	.673
9.	Explaining convincingly how protecting plants and animals can reduce the effect of climate change	3.45	.649
10.	Explaining to students sufficiently by not wasting electricity can reduce climate change	3.38	.613
11.	Prove to students how minimizing the use of carbon-dioxide fitted cars can reduce the effect of climate change.	3.30	671
12.	Explaining sufficiently on how reducing use of objects materials can reduce the effect of climate change	3.17	.615
13.	Prove to students how gradually ceasing of greenhouses operation can reduce climate change effect	3.05	. 699
14.	Explaining convincingly on how minimal use of carbon-fitted cars can reduce the effect of climate change	3.12	. 691
15.	Explaining sufficiently to students on how bush burning contribute to climate change.	2.90	.951
16.	Proving to students how avoiding deforestation can reduce the effect of climate change	3.12	.825
17.	Explaining to students effectively how using of chemicals in the environment can affect climate change	3.12	.904
18.	Explaining to students convincingly how using farm yard manure can reduce the effect of climate change	3.17	.763
19.	Explaining to student efficiently on how not using machines can reduce the effect of climate change	3.17	.763

20. Teaching the students effectively on how depletion of ozone layer can be reduce.	3.08	.671
Grand mean		

from the above table the mean rating of teachers competency needs for mitigating the effect of climate change in Cross River Nigeria. The means for the items 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20 respectively .these means are above the the bench mark of 2.50. this shows that teachers competency needs for mitigating the effect of climate change is Very Highly Needed by teachers the 2.50 grand mean is also above the benchmark of 2.50 and the standard deviation of 0.80 shows that teachers competency needs for mitigating the effect of climate change in Cross River State is highly needed.

Research Question 3: What is the influence of qualification on climate change information competency needs of teachers in Cross River State?

Table 3: I**nfluence of educational qualification on teachers' climate change information competency needs in Cross River State?**

Qualification	N	MEAN	SD
B.Ed.	43	3.30	0.78
M.Ed	14	3.21	0.86
Ph.D	3	2.71	0.47
TOTAL	**60**		**0.80**

The table above shows the influence of educational qualification on climate change information competency needs of teachers in Cross River State, the data shows that those with B.ED has a mean of 3.30, which is above the bench mark of 2.50 used in decision making. On the other hand, teachers who have M.Ed have a mean of 3.21 which is also above the bench mark of 2.50 finally those who have Ph.D have a mean of 2.71 which is above the bench mark of 2.50 thus the qualification is very highly needed by teachers in Cross River State for climate change information competency needs in Cross River.

Research Question 4: What is the influence of educational qualification on teachers' climate change mitigation needs in Cross River State?

Table 4: I**nfluence of educational qualification on climate change mitigation needs of teachers in Cross River State?**

Qualification	N	MEAN	SD
B.Ed.	43	3.27	0.67
M.Ed	14	3.08	0.55
Ph.D	3	3.15	0.54
TOTAL	**60**		**3.88**

Table 4 above shows the influence of qualification on climate change mitigation needs of teachers in Cross River State, the data on the table shows that B.ED have the mean value of 3.27 which is above the bench mark of 2.50 used in decision making. Therefore, the influence of B.Ed have more influence on climate change mitigation needs in Cross River State. On the other hand M.ED have the mean value of 3.08 which is above the cut off

mark thus teachers with M.Ed also have very highly need of climate change mitigation needs also the teachers with Ph.D also have the mean of 3.15 which is above the bench mark of 2.50 which is use for decision making, therefore, the teachers with Ph.D have very highly need for climate change mitigation in Cross River State.

Hypotheses:1 There is no significant difference in the mean (x) ratings on teacher's climate change information competencies needs based on educational qualification in Cross River State.

Table 9 : Summary of ANOVA on significant difference in the mean ratings of teacher's climate change information competencies needs based on educational qualification in Cross River State.

Qualification	N	mean	DF	F	(P-value)
Sig					
B.Ed.	43	3.30			
M.Ed	14	3.27	2	4.20	0.25
Ph.D	3	2.73			

Table 9 presents data for the analysis of variance (ANOVA) for hypothesis 1 which stated that there is no significant difference in the mean rating of teachers climate change competencies needs based on qualification in Cross River State. The f calculated (F-cal) value 4.20 and p-value is 0.25 which is above 0.05 level of significance indicating that qualification on climate change information competency of the teachers. We therefore uphold the null hypothesis which state that there is significant difference in the mean rating of teacher's climate change competencies in Cross River State Nigeria.

Hypotheses 2: There is no significant difference in the mean ratings of teachers climate change mitigation competency based on educational qualification in Cross River State

Table 10: Summary of ANOVA on significant difference in the mean ratings of teachers climate change mitigation competency based on educational qualification in Cross River.

Qualifications	N	mean	DF	F	(P-value)
Sig.					
B.Ed.	**43**	3.30			
M.Ed	14	3.28	2	1.26	0.28
Ph.D	3	2.71			

Table 10 presents data for the analysis of variance (ANOVA) for hypothesis 2 which stated that there is no significant difference in the mean ratings of teachers climate change mitigation competency based on qualification in Cross State Nigeria. The F calculated (F-cal) value is 1.26 and p-value is 0.28 which is greater than 0.05 level of significance indicating that teachers qualification have significant difference in the mean rating of their climate change mitigation competency based on qualification. We therefore uphold the null hypothesis which state that there is no significant difference in the mean ratings of teachers climate change mitigation competency based on qualification in Cross River State.

Discussion

The findings of this study with respect to the research question one showed that teachers with higher and lower qualification needs climate change information to be tackle or reduce and manage the effect of climate change that has drastically affected the area. The prevailing and drastic changes in the area with unpredictable weather which has lead to environmental hazards such as flood, land slid, drought and other environmental problems has inform the citizen to have first-hand information from the means and channels discussed in this study. Adebayo (2018) asserted that education help the teacher have climate change than the illiterate farmers. These findings are not surprising because lower qualification may have effect on climate change knowledge as compare with those who had no tertiary education may find it difficult to know what climate change is. Tertiary education has raised teachers' information awareness of climate change. In my opinion, level of education of an individual plays a critical role in the climate change information knowledge and understanding of phenomena that would help tackle climate change. Education is the single strongest predictor of climate change information..

This study reveal that the teachers with higher qualification needs climate change mitigation competency, to be able to manage any occurrence within the their schools, because some schools have been affected by thunder storm, land slid and other natural and man induced hazards that have disrupted the school teaching hours and time table, and in some occasion some students and teachers have been affected with psychological and physical implications. This finding is line with Ikonomidis, (2012). Teacher's knowledge of nuclear power can be a significant way to reduce carbon. However, it is Indicate that teachers' knowledge of mitigating actions is low and that education on climate change mitigation is called for. However, the most effective teacher is to transfer knowledge of climate change to the younger generation and families, if the teacher is the best channel to transfer knowledge of climate change to the people, the teacher must first of all be informed of what climate change is. This study reveal that teachers in the Riverine and Hinterland needs climate change information despite their location within the area, because climate change has affected the teachers with the Riverine areas and those within the Hinterland, to be able to deal or get prepare for any unforeseen event that is perpetuated by climate change in future and other consequences they need to have access to climate change information to enable them cope. The effect of climate change is felt by humans, plants, animals; microbes and aquatic organisms at different degrees depending on the location of the individual across the globe (Ugwuda & Ogbonnaya, 2017). There is a general perception that locations close to the coast are more likely to experience the impacts of climate change than the hinterland.

Conclusion

This study investigated needs assessment of teachers`climate change information and mitigation competences in cross river state. The variables involved in this study were assessment, mitigation information competency to climate change with regard to level of education, location and gender. Teachers had high information of climate change in Cross River State Nigeria, therefore information of climate change differ among the respondents in Cross River State Nigeria. Findings also indicated that respondents with low level education qualification high climate change as to those teachers with high level of education qualification of climate change information in Cross River State Nigeria. Therefore level of education had played a significant role in the information of climate change. On information of climate change based on location, teachers in riverine areas

were more informed than those in hinterland in Cross River State Nigeria. This implied that their climate change information differs by location in Cross River State Nigeria.

REFERENCES

Adebayo (2018). Carbon mitigation in domains of high consumer lock-in. Global Environmental Change, 52, 117–130.(Source: UN Habitat (2007): Climate change mitigation through urban planning and development – an overview. Presentation, 11May2007.http://unfccc.int/files/methods_and_science/mitigation/application/1_karl_unhabitat.pdf). /
0797 /EGR20 19.pdf?seque nce=1&isAll owed=y. Accessed 22

Akinbobola, T. O., Adedokun, S. A. & Nwosa, P. I. (2015). The impact of climate change on composition of agricultural output in Nigeria. *American Journal of Environmental Protection, 3* (2), 44-47.

Badmos, B., Sawyerr, H., Salako, G., Oyewumi, A., Adedotun, A., Olalubi, O. & Badmos, O. (2018). Gender variation on the perception of climate change impact on human health in Moba Local Government Area of Ekiti State, Nigeria.*Journal of Health and Environmental Research,4* (1), 1-9. *Behavioral Sciences* 167:23-27. https://doi.org/10.1016/j.sbspro.2014.12.637

Federal Government of Nigeria, (2017). Federal Ministry of Information and Culture: Climate change in Nigeria: A brief review of causes, effects and solution. Retrieved from climatechange.gov.ng.

Grist, S. (2018). We broke down what climate change will do, region by region. Retrieved fromfile:///C:/Users/USER/Documents/location.htm.*health*. Geneva.http://www.who.int/en/news-room/fact-sheets/detail/climate-change-and-health https ://unfcc c.int/site/defau lt/files/resource/Climate Action Suppo rt Trend s_2019.pdf. Accessed Dec 2019https ://wedoc s.unep.org/bitst ream/handl e/20.500.11822https://doi.org/10.1080/13504622.2020.1728233.

Ikonomidis, S., Papanastasiou, D., Melas, D., & Avgoloupis, S. (2012). The anthropogenic fromhttps://doi.org/10.1080/13504622.2020.1728233https://doi.org/10.1371/journal.pone.0260626Https://pedialink.aap.org/File%20Library/About%20AAP%20CME/Gaps-and-Needs-
https://unfccc.int/sites/default/files/resource/cp24_auv_L.3_edu.pdf

IPCC (2013) IPCC factsheet: what is the IPCC? https ://www.ipcc.ch/site/assets/uploa . A special report of Working Groups I and II of the Intergovernmental Panel on ClimateChange. Cambridge University Press, Cambridge, UK, 19. *International Journal of Education Development, 32*, 376-383.

IPCC .(2019) Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the

context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte Waterfield (eds.)]. In Press

Mason, J. (2013). A rough guide to the components of earth's climate system. Retrieved from https://skepticalscience.com/earths-climate-system.html.Mata Press

Nworgu, B . G. (2015). Educational Research: Basic Issues and Methodology. Nsukka: University Trust Publishers.

Ugwuda, S. O. & Ogbonnaya, E. K. (2017). Strategies for Public Awareness of Climate Change for Sustainable Livelihood. Journal of Home Economics Research (HERAN), 28 (2), 12 - 22. December.

UNESCO (2018). Climate Change Education and Awareness**,** https://en.unesco.org/themes/addressing-climate-change/climate-change-education-and-awareness

Wynes, S., & Nicholas, K. (2017). The climate mitigation gap: Education and government economy. *Journal of Environmental Science, Toxicology and Food Technology, 6* (2), 7-12. warming of 1.5 ℃ above pre-industrial levels and related global greenhouse gas