

Integrating Climate Change Adaptation Strategies into the Secondary School English Language Curriculum in Nigeria for Sustainable Development

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Abstract

The paper sought the opinions of English language teachers on the integration of climate change adaptation strategies into the secondary school English language curriculum in Nigeria for sustainable development. Three research questions guided the study. The design of the study was the survey research design. The study was carried out in Nsukka Education Zone of Enugu State with 137 English language teachers constituting the sample for the study. The Climate Change Adaptation Questionnaire was developed and validated. The data got were analyzed using means and standard deviation to answer the research questions. The results revealed that respondents agreed that climate change themes such as meaning, causes, vulnerability and impact as well as climate change adaptation strategies should be integrated into the secondary school English language curriculum. They also agreed that debates, stories, drama and speeches are some of the strategies through which climate change adaptation can be integrated into the English language curriculum. They were also of the opinion that integration of climate change adaptation strategies into the English language curriculum would require the training and retraining of teachers and production of relevant textbooks. On the basis of the findings it was recommended that the English language curriculum should be expanded to include climate change themes, while workshops should be organized at the school, community, state and federal levels to sensitize all stakeholders, including teachers, students and parents on the reality of climate change and appropriate adaptation strategies.

Keywords: Adaptation Strategies, Climate Change, English Language Curriculum, Integration

1. Introduction

Climate change issues have taken the front burner in current global discourse. This arises from the scientific consensus that the climate is changing and that the impact of this change is felt in every part of the world, including Nigeria. The United Nations in 2015 included climate change actions as the Goal No 13 in the 17 Sustainable Development Goals (SDGs) or Global Goals. These goals are aimed at achieving better and more sustainable future by the year 2030. The United Nations

recognizing the importance of the climate to global sustainability calls for urgent action to combat climate change and its impacts. According to Haider (2019), the impact of climate change has been evident in the increases in temperature, variable rainfall, rise in sea level and flooding, drought, desertification and land degradation. Ilevbare (2019) reports that one of the impacts of climate change in Nigeria is the drying up of Lake Chad, formerly occupying an estimated area of 40,000 km², but at present covers only 1300km². The implication of this is the expansion of Sahara desert, desertification and massive migration of people in search of fertile land. This is in addition to the several health risks that are attendant on climate change.

Several definitions have been given to climate change. For example, the Intergovernmental Panel on Climate Change (IPCC) (2001) defines it as the statistically significant variation in either the mean state of the climate or its variability, persisting for an extended period of time, typically decades or longer. For Levina and Tirpak (2006), it is the significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. However, the most general definition of climate change according to Levina and Tirpak (2006) is that it is a change in the statistical properties of the climate system when considered over long periods of time regardless of cause. But, specifically, climate change refers to the change in climate resulting from human activity as opposed to changes in climate that may have resulted as part of Earth's natural processes (Levina & Tirpak, 2006). In this context climate change is synonymous with anthropogenic global warming, that is, increase in green house gas levels as a result of human factors. These anthropogenic or human factors are more important to this study because they are factors that human beings can possibly reduce and control.

So many anthropogenic factors may be responsible for climate change impacts. For instance, since the industrial revolution of the 19th century, the era of large scale use of fossil fuels was ushered in. Land that was formerly covered with vegetation has been cleared for the building of houses and industries and for use as firewood. Natural resources are in the same vein being extensively used for consumption. Consumerism has also increased, leading to large quantities of waste. All these have contributed to the rise in carbon dioxide and green house gases in the atmosphere with their attendant consequences. The effects include the change in crop yield in response to a change in the mean range or variability to temperature; damage caused by an increase in the frequency of coastal flooding due to sea level rise (IPCC TAR, 2001), negative effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems, human health and welfare. It also has adverse effects on water resources, agriculture, forestry, fisheries, human settlements and ecological systems.

In the event of the hazardous effects of climate change, many people or nations may be more vulnerable than others. Vulnerability refers to the magnitude of harm that would result from a particular hazardous event (UKCIP, 2003). It defines the extent to which a system is susceptible to and unable to cope with adverse effects of climate change. This is dependent not only on the system's sensitivity, but also on its adaptive capacity. Many countries in the third world and Africa, in particular, will be hit hardest by the effects of climate change. Olmos (2001) aptly observes that

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It is common knowledge that the poor are likely to be adversely hit by climate change and that the capacity to respond to climate change is lowest in developing countries and among the poorest people in those countries. Also, IPCC (2000) highlights that in the tropics and subtropics where dry land and non-irrigated agriculture dominate, yields are likely to decrease for even small changes in climate. As a result, there may be increased risk of hunger in some locations in the tropics and subtropics where many of the poorest people live.

It is based on these developments that there is urgent need for climate change adaptation strategies. According to Smit, Burton, Klein and Wandel (2000), adaptation refers to any adjustment, whether passive, reactive or anticipatory, which is proposed as a means of ameliorating the anticipated adverse consequences associated with climate change. It is also seen as the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC TAR, 2001). It can be deduced, therefore, that climate change adaptation refers to all adjustments in behaviour or economic structures which are aimed at reducing the vulnerability of society to changes in the climate system.

On the other hand, climate change adaptation strategies refer to a general plan of action for addressing the impacts of climate change. For a country, it refers to the broad plan of action, implemented through policies and measures, for addressing the impacts of climate change, including climate variability and extremes. According to UNDP (2005), it may include an amalgam of policies and measures, selected to meet the important objective of reducing the country's vulnerability. Failure to adapt to the impacts of climate change or even maladaptation could lead to more adverse effects. As a result, it is important to adopt strategies at public and private levels that will help to reduce these impacts and ensure safety and better life for the occupants of Earth. Without adaptation strategies, Olmos (2001) observes that the poor are likely to be hit hardest especially those living in developing countries like Nigeria.

Thus, there is need for public awareness on climate change and adaptation strategies. At present, Okeke (2013) points out that the overall level of public awareness of climate change issues is low in Nigeria. However, climate change should be an educational issue, requiring that the students at all levels of education be made aware of it as well as educated on how, in their own way, they can contribute to the improvement or worsening of the impacts of climate change. In fact the United Nations has as Target No 3 for climate change actions, the improvement of education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. Education, it is known, is an instrument of change and development. It is an overarching vehicle for inculcating ideas and values to the learners through language.

Language, on the other hand, plays a vital role in human existence and in education. Without language it may be difficult for humans across the globe to communicate with one another, educate their young ones and preserve their cultures. Sustainable development in the absence of language might not be tenable. It is through language that the teaching-learning process is made possible. In Nigeria, the language that performs this transmission function is the English language,

which is not only the nation's second and official language, but also the language used in teaching other subjects. Uloh-Bethels (2010) aver that the English language services all other subjects or courses offered in Nigeria's educational institutions. As such, it should integrate the terminologies and vocabulary of other subjects or courses in its own curriculum. In this context the terminologies and vocabulary to be so integrated are those associated with climate change.

In Nigeria, Climate change is not offered as a subject of study in the secondary schools. However, topics on climate and climate change are found in the geography curriculum of senior secondary school. But given the central position that climate change and environmental issues occupy in national and global concerns and the fact that students at every level of education should be taught the tenets of climate change at different levels of complexity for their sustainability, it stands to reason that the subject that should be used to transmit this knowledge should be the English language more than any other subject. Limiting the teaching of climate change topics to geography alone cuts off information from many students who do not offer this subject at the senior secondary school level. But the English language is offered as a subject by every student from primary to secondary school level. Even at the university level, it is offered as a general studies course. As a result, it is a subject that permeates all strata of learning. So, any educational programme that is aimed at touching the lives of every person in the school system should be best channeled through the waterways of the English language.

The English language has four basic language skills that students must acquire for effective use of the language. These skills are listening, speaking, reading and writing. While listening involves adequate processing of incoming signals in the form of sounds, words and statements, speaking is the oral activity in which thoughts are expressed through words or statements. Listening and speaking are coterminous. The activities that promote listening are virtually the same activities used in speech development. Some of the activities for improving fluency in speech include, according to NERDC (2006), impromptu speeches, debates, drama, class discussion and short drills. The objective of doing this is to express thoughts, ideas, views, opinions, experiences, observations, likes and dislikes in English on many global issues, including environmental issues, of which climate change adaptation issues are part.

Reading and writing may also provide limitless avenues for the teaching of climate change adaptation. Reading involves recognition and accurate interpretation of words in context, understanding of sentences no matter how complex as well as the ability to grasp the main ideas and import of what is read (NERDC, 2007). Materials suggested for reading at the senior secondary school level include topical issues of current and national interest, one of which is climate change. Writing, on the other hand, is the expression of ideas on paper so as to communicate such thoughts and ideas to an audience. Writing covers such areas as narrative writing, descriptive writing, speech writing, technical and scientific writing, report writing and creative writing. Climate change adaptation may be taught effectively by asking students to write on any of the themes on climate change. For instance, students can be asked to describe, narrate, argue on, explain or even write a

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speech on aspects of climate change – causes, impact, mitigation, vulnerability, adaptation, etc, especially having been exposed to them through extensive passages in the course of reading.

Realizing that the English language can be used as the courier for the teaching of many national and global issues more than any other subject in the curriculum, the Nigerian Educational Research and Development Council (**NERDC, 2007**) describes the English language as the *primus inter pares* among the core subjects in the senior secondary school curriculum. It is therefore more probable that instead of carving out a new subject on climate change or leaving it only to be taught as a topic in geography, there is likely to be more positive returns if climate change adaptation strategies are integrated into the English language curriculum for secondary schools. This is in line with the United Nation's global target No 2 for climate change actions which calls for integration of climate change measures into policies and planning. However, inclusion of climate change topics into the English language curriculum may require that school-related factors be addressed. These include training and retraining of teachers, production of relevant textbooks or course materials in English, especially in reading comprehension, where climate change themes are integrated. **Okeke (2013)** harps on the training and retraining of teachers as one of the important strategies for promoting climate change education. It may also require the procurement of basic equipment/facilities like videos and televisions which will assist students to watch documentaries on climate change issues.

Given this exposition in the foregoing, this paper set out to survey English language teachers' opinions on the possibility of integrating climate change adaptation strategies into the present English language curriculum for secondary schools. To achieve this broad purpose three research questions were posed to guide the study:

- What are the climate change adaptation themes that should be integrated into the English language curriculum for Nigerian secondary schools?
- What are the strategies for the integration of climate change adaptation into the English language curriculum?
- What are the school-related factors that should be considered for effective integration of climate change adaptation strategies into the English language curriculum?

2. Method

The study adopted the descriptive survey design. The population consisted of 165 teachers of English language from public secondary schools in Nsukka Education Zone of Enugu State, Nigeria. The total population was used as sample but only 137 of them successfully completed and returned the questionnaire. The instrument for data collection was the Climate Change Adaptation Questionnaire (CCAQ). It consisted of three parts. Part A sought to find out the climate change adaptation themes that should be integrated into the English language curriculum. Part B investigated the strategies for the integration of climate change adaptation into the English language curriculum. Part C ascertained the school-related factors that should be considered for effective integration of climate change adaptation strategies into the English language curriculum. The instrument was structured in line with the Likert four-point rating scale of Strongly Agree = 3.50 – 4.00, Agree = 2.50 – 3.49; Disagree = 1.50 – 2.49 and Strong Disagree = 0.00 – 1.49. The instrument was validated by three

specialists, two from English language education and the other from geography education. Suggestions made by these specialists were used in arriving at the final version of the instrument. Data obtained were analyzed using means and standard deviation. The criterion mean was pegged at 2.50. In other words, any item that had mean score of 2.50 was accepted while any that had mean score less than 2.50 was rejected.

3. Data Analysis and Interpretation

The results are presented according to the research questions

Table 1: Mean and standard deviation of climate change adaptation themes that should be integrated into the English language curriculum

S/N	Themes	SA	A	D	SD	Mean	SD	Decision
1.	Meaning of climate change	15	98	22	2	2.91	0.95	Accept
2.	Causes of climate change	23	102	12	-	3.08	0.78	Accept
3.	Vulnerability to climate change	34	99	4	-	3.22	0.89	Accept
4.	Effects/impacts of climate change	55	80	1	1	3.38	0.79	Accept
5.	Climate change mitigation	40	75	19	3	3.11	0.87	Accept
6.	Climate change adaptation	27	86	13	11	2.94	0.92	Accept
7.	Climate change adaptation benefits/costs	36	97	3	1	3.23	0.88	Accept
8.	Climate change adaptation capacity	16	45	60	16	2.45	0.17	Reject
9.	Climate change adaptation technology	12	43	45	37	2.22	0.36	Reject
10.	Climate change adaptation strategies	60	41	23	13	3.08	0.78	Accept

Source: Field Survey (2019)

Table 1 presents the responses of secondary school English language teachers on the themes that should be integrated into the English language curriculum. The table shows that items 1, 2, 3, 4, 5, 6, 7, and 10 had mean ratings above the criterion mean of 2.50, while items 8 and 9 had mean ratings below the criterion mean of 2.50. This indicates that the respondents agree that all the themes should be integrated except climate change adaptation capacity and climate change technology.

Table 2: Mean and standard deviation of the strategies for the integration of climate change adaptation into the English language curriculum

S/N	Themes	SA	A	D	SD	Mean	SD	Decision
1.	Debates on climate change	48	77	8	4	3.29	1.06	Accept
2.	Films on climate change	13	46	42	36	2.26	0.62	Reject
3.	Stories on climate change	26	86	23	2	2.99	0.52	Accept
4.	Drama on climate change	18	98	12	9	2.91	0.51	Accept
5.	Essays on climate change	17	81	29	10	2.77	0.63	Accept
6.	Comprehension passages on climate change	51	63	18	5	3.17	0.81	Accept
7.	Summary passages on climate	53	67	13	4	3.23	0.82	Accept

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change								
8.	Speeches on climate change	41	84	11	1	3.20	0.90	Accept
9.	News reports on climate change	42	42	36	17	2.80	0.23	Accept
10.	Short dialogues on climate change	30	49	40	18	2.66	0.74	Accept

Source : Field Survey (2019)

Table 2 shows that the English language teachers agree that all the items on the table can be used to integrate climate change adaptation into the English language curriculum except the use of films on climate change.

Table 3: Mean and standard deviation of the school-related factors that should be considered for effective integration of climate change adaptation strategies into the English language curriculum

S/N	Themes	SA	A	D	SD	Mean	SD	Decision
1.	Training and retraining of English language teachers	68	47	17	5	3.30	0.95	Accept
2.	Production of relevant textbooks/course materials	43	64	19	11	3.01	1.12	Accept
3.	Provision of basic equipment/facilities like videos for documentaries	12	28	60	37	2.11	0.41	Reject
4.	Integration of climate change themes into teacher-training programmes in tertiary institutions	36	53	33	15	2.80	0.90	Accept
5.	Formation of climate change clubs in schools to create interest among students	31	61	24	21	2.74	0.93	Accept

Source: Field Survey (2019)

Table 3 presents the responses of English language teachers on the school-related factors that should be considered for effective integration of climate change adaptation into the English language curriculum. The responses show that all the factors in the table were accepted as important except item No 3, which is the provision of basic equipment/facilities like videos in schools for documentaries on climate change.

4. Discussions

It is evident from the results on Table 1 that the English language teachers were of the opinion that climate change adaptation themes should be integrated into the English language curriculum. They agreed that themes like meaning and causes of climate change as well as vulnerability and impacts of climate change should be integrated. Other themes that should be integrated include climate change mitigation, climate change adaptation benefits/costs and climate change adaptation strategies. In Table 2, the results indicated that the English language teachers agreed that many strategies could be used to effectively integrate climate change adaptation into the English language curriculum. These strategies include the use of debates, stories, drama, essays, comprehension and summary passages

on climate change, as well as speeches, news reports and short dialogues on climate change. These findings are in line with **Okeke (2013)** who advocated for the development of skills curriculum in some subject areas including language arts. In agreement, **Uloh-Bethels (2010)** stated that since the English language services all other subjects or courses offered in Nigeria's educational institutions, it should integrate the terminologies and vocabulary of those subjects or courses in its curriculum.

However, the teachers were of the opinion that climate change adaptation capacity and adaptation technology were not important themes to be integrated in the secondary school English language curriculum. This could be explained probably from the point of view that these are higher order themes for higher levels of education, or for specialist areas like climatology. English language teachers also indicated in Table 3 that for climate change adaptation to be effectively integrated into the secondary school English language curriculum, certain school-related factors have to be considered. These include the training and retraining of teachers, the production of relevant textbooks/course materials that capture these themes, the integration of climate change themes into teacher training programmes in tertiary institutions and the formation of climate change clubs in schools to create interest among students. This finding is in line with **Okeke (2013)** who stated that one of the strategies for promoting climate change education is to train teachers on climate change adaptation strategies at pre-primary, primary, secondary and tertiary levels of education in Nigeria.

5. Recommendations

Based on the findings and discussion of results in the foregoing, this paper recommends as follows:

- The English language curriculum should be expanded to include climate change themes such as impacts, vulnerability, mitigation and adaptation.
- The English language teachers should be trained and retrained to be able to use strategies that will enable them successfully integrate climate change adaptation into their teaching.
- Workshops should be organized at the school, state and federal levels to sensitize both teachers and students on climate change issues.
- Course books in English language should be expanded to accommodate climate change adaptation themes.
- Students should be encouraged to form climate change clubs in schools where issues on climate change can be discussed, debates on climate change can be organized, and resource persons can be invited to speak on relevant topics.

6. Conclusion

Education is the vehicle for the transmission of knowledge. Knowledge brings power; power to adapt to changing climatic conditions in order to reduce their adverse effects on the health and wellbeing of the people. Instead of carving out a separate subject for the teaching of climate change, or limiting it to subjects like geography, social studies or science subjects that are offered by a few students in the secondary school, it is better to integrate the themes into the English language curriculum, since English is offered by every student from junior secondary school to the last class of senior secondary school. By so doing, the themes will be spread across all levels of the secondary school, thus creating the needed awareness among students who are going to be future policy makers and implementers.

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By doing this the nation would have taken a giant leap in the global desire for sustainable development.

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