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## Science Curriculum as a Tool for Improving Students Perception on Global Climatic Change in Nigeria: A Case Study of Obafemi Awolowo University, Nigeria

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### **Abstract:**

*The study examined the knowledge and perception of students about Climate change in a bid to point out the importance of Curriculum in reshaping the perception and knowledge of students about this concept. It also provided a framework for the curriculum on areas to focus on when developing the contents of the curriculum on Climate change and global warming. The study employed descriptive survey design as three hundred students were randomly selected across six faculties in Obafemi Awolowo University. One instrument was adopted for the study and it was validated and judged reliable with a value of 0.72 using Cronbach Alpha coefficient. The study revealed that the students in the study area have good knowledge of Climate change as revealed by 75.0% of the respondents. It was also revealed that majority of the respondents have the right perception about climate change as revealed by majority of the respondents. Most of the students got the Knowledge about climate change and global warming from Internet (18.9%) and television (18.2%). Respondents also have a high knowledge about the consequences of climate change and they believe that humans be more involved in assisting to reduce adverse effects of climate change. The study concluded that the level of awareness of students on climate change and greenhouse effect in Obafemi Awolowo University, Ile-Ife, Nigeria is rather low and the level of knowledge and perception of students can be increased by including the concepts in the university Curriculum to effect change in the society.*

**Keywords:** Curriculum, climate change, global warming

### **1. Introduction**

It is widely accepted that the curriculum is the tool towards initiating development and change in any society. It is the means through which behaviors of individuals in the society is changed and reconstructed to develop better individuals which will produce and effective and efficient community. Curriculum is frequently defined by educational theorists as the link between society and the schools. It is also referred to as the major source of stimuli found in instructional settings, or as pupil behavior pertinent to the goals of the school. (Wayne,1985).

Ehindero (2014) defines curriculum studies as the heart of education system. He stated that it is the fundamental starting point for learning, teaching and understanding in education. Ehindero (2014) pointed out that curriculum studies provide the framework and adequate data for educational planning, administration, the guidance and counselling of learners and other related academic activities that describes the nature and operations of institutes, colleges of education and related agencies and commissions. This goes further in explaining that for every desired change in the attitudes and perception of individuals in the society with a view to effect a change in the society itself, curriculum is a vital tool. There has been various clamors and discussions as regards the implementation of curriculum at all levels of institutions ranging from the especially the secondary and tertiary institutions. These had been in a bid to improve the implementation of the curriculum in schools as well as make the curriculum resonate with current societal trends and events.

In Nigeria for example, Oluniyi and Aluko (2012) stated that Obasanjo administration (1999-2007) put a committee to look into the school curriculum with a view to solving some of the societal problems and also towards achieving the objectives of the Millennium Development Goals (MGDs) policy initiatives and the curriculum of various subjects was reviewed.

In recent times, one of the most emerging trends in the society is Climate change and greenhouse effect. Kaufman (2018) revealed in a report by NASA that the average temperature between January 2018- June 2018 has been the hottest since 1880. IPCC(2007) defined climate change as any change in climate over time, whether due to natural variability or as a result of human activity. Akpodiogaga (2010) revealed that the two major influencers of Climatic change are temperature and Rainfall. He stated that the temperature trend in Nigerian since 1901 shows increasing pattern while rainfall has shown a rapid decline. The concept of Climate change and greenhouse effect is embedded in Science Education. There had

been worldwide recognition of the importance of science education in national development and this has found a central place in the curricula of schools at all levels (Ogbonna, 2007). Akinbobola and Afolabi (2010) stated that science learning must be significant and applicable; it should depict the ways of science, its procedure and must be output oriented.

According to Olasehinde and Olatoye (2014), science education is designed to guide the world toward a scientifically literate society and this is important for an understanding of science as it offers personal fulfillments and excitements. Panoy (2013) cited that the goal of science education is to develop students' skills and enable individuals to apply those skills in everyday lives. The implication of this is that teaching topics and concepts in Science education like Climate change and greenhouse effect will achieve all these objectives. Climate change is a major risk facing mankind. It is one of the many issues being confronted by the United Nations. Climate change is more than changes in weather; it encompasses environmental issues like flooding, storm surges, sea level rise, temperature rise, variability of precipitation, and extreme weather conditions (Pitpitunge, 2013). It is attributed to the rising concentration of greenhouse gases and increasing environmental degradation. It becomes a concern of international organizations and government institutions because of its impacts on different sectors such as agriculture, ecosystems and biodiversity (IPCC, 2007a). At the United Nations Climate Change Conference held in Paris in 2015, 195 countries agreed on a plan to reduce emissions of CO<sub>2</sub> and other greenhouse gases.

Climate change is fundamentally a biophysical phenomenon. However, the recent and accelerating warming of the earth's climate is largely attributable to human activity, and its impacts are mediated by psychological and social processes and can be limited primarily by human activity.

Global warming is not only an environmental danger but also a social and economic threat, and unfortunately, some adverse consequences of it are becoming visible these days. Greenhouse effect which causes this phenomenon, happens because of greenhouse gases (water vapour, carbon dioxide, methane and so on) existing in the atmosphere, trapping sunrays and making earth's atmosphere warmer.

As human activities continue to add greenhouse gases – carbon dioxide, methane, and nitrous oxides – to the Earth's atmosphere, global temperatures are expected to rise, causing the Earth's climates to change. Furthermore, human health and agriculture may be sensitive to climate change. The Intergovernmental Panel on Climate Change (IPCC) has concluded that global warming is inevitable and that human activity is likely to be the main cause. Global concern regarding the devastating impact of climate change and greenhouse effect has emphasized the need for creating awareness and building community capacity for adaptation, strategies to mitigate the effects and the best tool for this is the school curriculum.

The effects of global climate change and greenhouse effect are already being observed in the Nigeria and worldwide, and are projected to increase substantially over the next century and beyond (Santer, et al 2012). If people's knowledge of environment generally improves, they will behave in a manner that avoids environmental degradation (Skamp, Boyes, and Stanisstreet, 2009). This fact is also true about global warming phenomenon; since the people's behaviour in the field of producing greenhouse gasses is a determinant factor and their action is directly dependent on the amount of knowledge about this matter, it is so important to discover what they know in this regard. There may be some misconceptions about climate change in persons' minds; therefore, it is necessary to explore those misconceptions before any educational planning (Kilinc, Stanisstreet, and Boyes, 2008). As students are among the most trainable stratum of the society, it is essential to discover their knowledge and perception of global climate change and greenhouse effect to prepare the best kind of educational programme for them. Being sensitive towards nature through a strong programme of climate change awareness is very important at this point in time, especially among students and this could only be brought about by including the concept in the school curriculum. This is imperative in the sense that when students are in the know of the impact of climatic change, they can play vital role in the dissemination of information of environmental knowledge with its associated problems and solution. The importance of this is germane in tertiary institutions as they serve as the last educational phase before individuals become finally free to be gainfully employed in the society. The clamour is therefore to include this course into the general courses' students are supposed to take as part of their educational requirements irrespective of course admitted to in the University. This is in a bid to fasten their awareness towards global climatic change and greenhouse effect, it is essential to know what level of knowledge they possess in order to have a better grasp on development processes across context. Thus, this current study seeks to assess the perception of students in the Obafemi Awolowo University on global climate change and greenhouse effect with a bid to suggest its inclusion as a compulsory course in the curriculum to create proper awareness and understanding for the protection of the society.

### *1.1. Statement of Research Problem*

Climate change is quite an important subject in the discourse of development in this modern age. However, in spite of its significance, there is yet no clear evidence on whether this increasingly pressing subject has been clearly or commonly understood: "What exactly is climate change?" remains a question that has not been satisfactorily answered yet, making it more of an idea, a perception, a theory than an established fact. This is even more problematic when taking into consideration that the effects of climate change are generally perceived as negative (albeit in varying degrees) to humanity as a whole - a situation that seems to demand a concerted action. The question that becomes problematic, therefore, is whether it is possible to mobilize concerted efforts against the perceived scourge of climate change in a situation where there is no common understanding of the problem at hand. This question is even more important to examine when taking into consideration that the world is being told that the effects of climate change can only be mitigated by the very human beings who are seen as its main cause and catalyst. If this is really the case, it should be realized that not all human beings

can contribute the same amounts of time, effort and expertise to the mitigation of climate change. This is simply because human beings possess different powers, capabilities and levels of training when it comes to driving the direction of this mitigation and how the development thereof should take. Obafemi Awolowo University for example, like every other tertiary institutions in Nigeria demands that students offer some compulsory courses like Use of English and Introduction to library studies for newly admitted students with a view to promote their understanding in this concepts. It is therefore imperative to provide information on the various level of awareness, perception and understanding of Climate change with a view to advocate for its inclusion in the University curriculum as one of the core requirement courses to better protect the environment. Paying adequate attention to the perception of students would bring to fore the level of awareness among students both at the undergraduate and the postgraduate levels in the Obafemi Awolowo University, Ile-Ife. The present study intends to fill this gap.

## 2. Objectives of the Study

The specific objectives of the study are too;

- Assess the perception of students on Climate change and greenhouse effect in Obafemi Awolowo University;
- Examine the level of knowledge of students on Climate Change and greenhouse effect in the study area;
- Examine the knowledge of students on different sources of information about climate change and greenhouse effect in the study area ;
- Examine the perception of students on the consequences of Climate change and greenhouse effect in the study area ; and
- Determine the perception of students on the ways of reding Climate change

### 2.1. Research Questions

- What is the perception of students on climate change and greenhouse effect in the study area?
- What is the level of students' knowledge on the causes of climate change and greenhouse effect in the study area?
- What are the different sources of information about climate change and greenhouse effect in the study area?
- What is the perception of students on the consequences of climate change and greenhouse effect in the study area?
- What is the perception of students on the reduction of Climate change in the study area?

### 2.2. Research Methodology

The study is a descriptive survey research design to assess the students' perception on global climate change and greenhouse effect. The population for the study comprised of all students from six faculties in Obafemi Awolowo University, Ile-Ife, Nigeria. Three hundred students were selected using simple random sampling technique. From the thirteen faculties in the University, six were randomly selected using simple randomly sampling technique. Fifty students were randomly selected from each faculty. This include; 50 students from Faculty of Agriculture, 50 students from Faculty of Arts, 50 students from Faculty of Education, 50 students from Faculty of Environmental Design and Management (EDM), 50 students from Science and 50 students from Faculty of Social Sciences. This study utilised both quantitative and qualitative techniques for purpose of enriching the findings. The research instruments used in this work consisted of a self-structured questionnaire. The questionnaire was divided into two sections, that is section 'A' which has the demographic characteristics of respondents, and section 'B' which has questions that relate to the objectives of the study. The instrument was validated using Cronbach Alpha coefficient and yielded a validity of 0.72. Data was analysed using appropriate descriptive statistics.

## 3. Results and Discussion

### 3.1. Research Question One: What is the Perception of Students on Climate Change and Greenhouse Effect?

This question was analysed based on the questions answered by the respondents in the questionnaire. Responses strongly agree were scored 4, agree=3, disagree=2. Strongly disagree=1, undecided=0.

S/N	Statement	Strongly Agree Freq(%)	Agree Freq(%)	Disagree Freq(%)	Strongly Disagree Freq(%)
1.	Climate change is the same as Global warming	39(21.7)	50(27.8)	36(20.0)	13(7.2)
2.	Climate change is the same as Greenhouse effect	24(13.3)	28(21.1)	48(26.7)	10(5.6)
3.	Climate change is change in weather as a result of man's activities on earth	73(40.6)	64(35.6)	6(3.3)	5(2.8)
4.	Global climate change is a natural fluctuation in earth's temperature	35(19.4)	83(46.1)	20(11.1)	6(3.3)
5.	Climate change is just a natural fluctuation in earth surface	24(13.3)	58(32.2)	29(16.1)	2(1.1)
6.	It is too late to do anything about climate change	17(9.4)	18(10.0)	64(35.6)	50(27.8)
7.	The evidence of climate change is reliable	41(22.8)	50(31.1)	21(11.7)	14(7.8)
8.	The climate of all continents/regions are the same, i.e. it is the same for Africa, America, Europe etc.	22(12.2)	22(12.2)	52(28.9)	60(33.3)
9.	Everyone should have the knowledge about climate change and greenhouse effect	89(49.4)	69(38.3)	6(3.3)	16(8.9)
10.	Only scientists should be taught concepts on climate change	12(6.7)	18(10.0)	62(34.4)	83(46.1)
11.	Pollution from industry is the main cause of global climate change	43(23.9)	70(38.9)	48(26.7)	2(1.1)
12.	The government is doing enough to tackle climate change	6(3.3)	38(21.1)	52(28.9)	49(27.2)
13.	The media always talk about climate change and greenhouse effect	37(20.6)	44(24.4)	29(16.1)	5(28.3)

Table 1: Knowledge of Climate Change and Greenhouse Effect

On accessing the perception of the respondents on global climate change and greenhouse effect, it was revealed that 49.5% of the respondents agreed that climate change is the same thing as global warming. This shows an average level of knowledge on the question asked. 34.4% agreed that climate change is the same as greenhouse effect while 76.2% agreed that climate change is the change in weather as a result of man's activities. It was also revealed that 65.5% of the respondents agreed that global climate change is a natural fluctuation in earth's temperature and 45.5% agreed that climate change is just a natural fluctuation in earth surface.

It was also revealed that 19.4% shows that it is too late to do anything about global warming while 53.9% shows that the evidence of climate change is reliable. It was also revealed that 24.4% of the respondents agrees that the climate of all continent is the same. It was also agreed by 87.7% of the respondents that everyone should have the knowledge about climate change and greenhouse effect while 80.5% of the respondents disagreed that only scientists should be taught concepts on climate change while 62.8% agreed that pollution from industry is the main cause of global climate change and 24.4% agreed that government is doing enough to tackle climate change as 45.0% agreed that media always talk about climate change and greenhouse effect.

This reveals that there exists a good perception of students on climate change and greenhouse effect among the respondents as shown by the high percentage of right responses to items 1, 4, 10, 13, 15 and wrong response to items 12, 14 and 16.R

### 3.2. Research Question Two: What is the Level of Students' Knowledge on the Causes of Climate Change and Greenhouse Effect?

S/N	Statement	Strongly Agree Freq (%)	Agree Freq (%)	Disagree Freq (%)	Strongly Disagree Freq (%)
1.	Climate change is caused by ozone layer depletion	42(23.3)	67(37.2)	22(12.2)	2(1.1)
2.	Pollution from industry is the main cause of global climate change	43(23.9)	70(38.9)	48(26.7)	2(1.1)

Table 2: Level of Students' Knowledge on Causes of Climate Change and Greenhouse Effect

On the level of students' knowledge on the causes of greenhouse effect and climate change, it was revealed that 60.5% agreed that climate change is caused by ozone layer depletion while 64.8% agreed that pollution from industry is the main cause of climate change. This shows that students have a high level of knowledge on the causes of climate change and greenhouse effect.

Sources	Yes Freq (%)	No Freq (%)
Air pollution	109(60.6)	67(37.2)
Poor waste management	90(50.0)	86(47.8)
Water/Gutter	53(29.4)	123(68.3)
Climate change	111(61.7)	63(36.1)
Disposing waste in flowing water	81(45.0)	95(52.8)
Overpopulation	62(34.4)	114(63.3)
Flooding	86(47.8)	90(50.0)
Litter	70(38.9)	106(58.9)
Greenhouse effect	48(26.7)	128(71.1)
Water/Gutter	69(38.3)	103(57.2)

Table 3: Sources of Climate Change and Greenhouse Effect

The table above revealed that 60.6% of the respondents agreed that air pollution is a sources of greenhouse effect and climate change while 50.0% agreed that poor waste management is a source of greenhouse effect and climate change while 29.4% agreed that water/gutter has an effect on climate/greenhouse effect. It was also revealed that 61.7% of the respondents agreed that climate change has an effect on climate/greenhouse effect while 45.0% agreed that disposing waste in flowing is a sources of greenhouse effect and climate change and 34.4% believes overpopulation is a sources of climate change. It was revealed that 47.8%, 38.9%, 26.7% and 38.3% agreed that flooding, litter, greenhouse effect and water/gutter are major source of climate change.

Effect	Frequency	Percentage (%)
Air Pollution	37	41.1
Disposition	14	15.6
Poor waste	21	23.3
Over population	2	2.2
Flooding	10	11.1
Water	4	4.4
All of the above	2	2.2

Table 4: Most Effect on Climate Change

The above table revealed that 41.1% of the students agreed air pollution is the major cause of climate change while 15.6% agreed that disposing waste material is the major cause and 23.3% agreed that poor waste management is the major cause while 2.2%, 11.1% and 4.4% believed that overpopulation, flooding and sources from water and gutter are the major source of climate change and greenhouse effect.

### 3.3. Research Question Three: What are the Different Sources of Information about Climate Change and Greenhouse Effect?

	Yes Freq(%)	No Freq(%)
Have you heard about Climate Change	135(75.0)	45(25.0)

Table 5: Knowledge of Climate Change

It was revealed that 75.0% of the respondents have heard about climate change and greenhouse effect while 25.0% have not. This shows that there exist a high level of knowledge of climate change and greenhouse effect in the study area.

S/N	Statement	Frequency	Percentage (%)
1.	Television	102	18.2
2.	Radio	63	11.3
3.	Books	24	4.3
4.	Friends	35	6.3
5.	Internet	105	18.9
6.	School	101	18.1
7.	Social Media	56	10.0
8.	Academic Journals	46	8.2
9.	Library	15	2.7
10.	Others	12	2.1
11.	Total	559	

Table 6: Where Did You Hear it from?

The result above revealed that the high sources of information about climate change and greenhouse effect are internet (18.9%), television (18.2%) and school (18.1%), while the least sources of information are radio (11.3%), social media (10.0%), academic journals (8.2%), friends (6.3%), books (4.3%), library (2.7%) and others (2.1%). These others include sources that are not stated above as sources of information on climate change and greenhouse effect.

#### 3.4. Research Question Four: What is the Perception of Students on the Consequences of Climate Change and Greenhouse Effect?

S/N	Statement	Strongly Agree Freq (%)	Agree Freq (%)	Disagree Freq (%)	Strongly Disagree Freq (%)
1.	Increase in rainfall and extreme weather	70(38.9)	65(36.2)	12(6.7)	2(1.1)
2.	Affect all regions around the world	89(49.4)	48(26.7)	5(2.8)	2(1.1)
3.	Polar ice shields are melting and the sea is rising	40(22.2)	42(23.3)	15(8.3)	13(7.2)
4.	Increase in the number of heat-related deaths in some regions and a decrease in cold-related deaths in others	27(15.0)	45(25.0)	46(25.6)	12(6.7)
5.	Changes in the distribution of water-borne illnesses and disease vectors	28(15.6)	32(17.8)	33(18.3)	11(6.1)
6.	Affect many plants and cause animal species to struggle to cope well	54(30.0)	38(21.1)	32(17.8)	5(2.8)

Table 7: Perception of the Consequences of Climate Change and Greenhouse Effect

On the perception of students on the consequences of climate change and greenhouse effect, it was revealed from the table above that 75.1% agreed that the consequence of climate change and greenhouse effect is increase in rainfall and extreme weather while 7.8% disagreed and the rest do not know. It was revealed that 76.1% agreed that climate change and greenhouse effect affect all regions around the world but 3.9% disagreed while the rest are undecided. It was also revealed that 45.5% agreed that polar ice shields are melting and the sea is rising but 15.5% disagreed and the rest are undecided. It was revealed that while 40.0% agreed that there is increase in the number of heat-related deaths in some regions and a decrease in cold-related deaths in others as a consequence of climate change and greenhouse effect, 32.3% disagreed. Also, it was revealed that 33.4% agreed that there is changes in the distribution of water-borne illnesses and disease vectors as a result of climate change and greenhouse effect, but 24.4% disagreed. It was revealed that 51.1% agreed that climate change and greenhouse effect affect many plants and cause animal species to struggle to cope well while 20.6% disagreed. This shows that students have a right perception about the consequences of climate change and greenhouse effect.

#### 3.5. Research Question Five: What is Perception of Students on the Various Ways to Reduce the Effect of Climate Change and Greenhouse Effect?

Effect	Yes Freq(%)	No Freq(%)
Do you think anything can be done to tackle climate change	103(57.2)	77(42.8)

Table 8: Reduction of Climate Change

It was revealed from the table above that 57.2% of the respondents believe that something can be done to tackle the effect of climate change while 42.8% do not think so.

S/N	Statement	Strongly Agree Freq (%)	Agree Freq (%)	Disagree Freq (%)	Strongly Disagree Freq (%)
1.	Human beings can do their bit to reduce the effect of climate change	70(38.9)	69(38.3)	21(11.7)	0(0.0)
2.	People should be made to reduce their energy consumption if it reduces the effect of climate change	32(17.8)	49(27.2)	38(21.1)	6(3.3)

Table 9: Perception on Reduction of Climate Change

The table above showed that 77.2% agreed that human beings can do their bit to reduce the effect of climate change and greenhouse effect while 45.0% agreed that reducing climate change is basically by people being made to reduce their energy consumption if it reduces the effect of climate change and greenhouse effect.

#### 4. Discussion of Findings

The finding from research question one revealed the level of perception of students on climate change and greenhouse effect is high. It revealed that majority of the students (both undergraduate and postgraduate) are aware of the issues that are related to climate change and greenhouse effect. This finding is against the views of Nisbet & Myers (2007) that only 22% of the public felt that they understood global warming very well, and the lack of knowledge about global warming can also be seen in public opinion trends regarding the Kyoto protocol.

The finding from research question two revealed that the perception of the causes of climate change and greenhouse effect is high as they indicated that human activities on earth's surface causes temperature to rise. This invariably is being referred to as an anthropomorphic cause (Nzokizwa, n.d.). The finding is in line with the submission of Intergovernmental Panel in Climate Change (IPCC, 2007b) that most of the observed temperature increase since the middle of the 20<sup>th</sup> century was caused by increasing concentration of greenhouse gases resulting from human activity such as fossil fuel burning and deforestation. Many scholars like Medugu (2009), Magawata & Ipinjolu (2014) have hinted on the natural events and the human activities which are believed to be contributing to an increase in average global temperatures.

The finding from research question three revealed that the sources of information about climate change and greenhouse effect is high. This is against the views of Nisbet & Myers (2007) that in the early half of the 1980s, climate change received little media attention which is reflected in only 39% of the public having heard or read about anything greenhouse. Also, this finding is against the view of Dalelo (2011) that most students do not have adequate knowledge or information about the projected or actual impact of climate change.

The finding from research question four revealed that the perception of students on the consequences of climate change and greenhouse effect is very high. Students are of the view that climate change and greenhouse effect have caused increase in rainfall and extreme weather, the melting of Polar ice shields and rising of the sea, increase in the number of heat-related deaths in some regions and a decrease in cold-related deaths in others, changes in the distribution of water-borne illnesses and disease vectors, and have affected many plants and caused animal species to struggle to cope well. This finding is in line with Khan (2017) who discussed that the effect of climate change and greenhouse effect had resulted in rapid climate change, expansion of disease carriers, increase in average temperature, increase in sea level, change in rainfall pattern, and changes in seasonal characters.

The finding from research question five revealed that human beings are in the best position to bring about the much-needed solution to the surge of climate change and greenhouse effect if they can reduce their energy consumption.

#### 5. Conclusion

This study concluded that there are several evidences to show that climate change and greenhouse effect are caused by the activities of human beings on earth, often seen as an anthropomorphic cause which has made earth's surface temperature to rise. The study identified the effect of climate change and greenhouse effect which result to the experience of terrible environmental problems such as ozone layer depletion, extinction of various tropical plants, flooding, earthquakes, volcanic eruption, air pollution amongst others. It revealed that the level of carbon dioxide in the atmosphere is rising significantly. The study agree that people should be made to reduce their energy consumption in order to reduce the effect of climate change and greenhouse effect, and that the knowledge of climate change and greenhouse effect can help to reduce man's causes of it.

#### 6. Recommendations

Based on the findings of the study, it was recommended that adequate information should be available to students on the causes and effect of climate change and greenhouse effect. this could best be done by and inclusive curriculum where students are adequately taught about the causes, effects as well as sources of information about climate change and greenhouse effect. Emphasis should be placed on the relationship between global warming, greenhouse effect and climate change. Ways to control global warming, differences in Climate across all continent, knowledge about the causes and consequences of Climate change as this will increase the percentage of students who possess this awareness. Since climate change and greenhouse effect affect everyone, it is expedient on schools to enlighten students on these facts. This can be adequately done when climate change and greenhouse effect are added to the curricula of schools. These knowledges will help them to be more aware of this concept and will be able to better protect their environment.

#### 7. References

- i. Akinbobola, A.O. & Afolabi F. (2010). Analysis of Science Process Skills in West African Senior Secondary School Certificate Physics Practical Examinations in Nigeria. *American Eurasian Journal of science Research*, 5 (4.), 234-240.
- ii. Akpodiogaga, O. P. (2010) General Overview of Climate Change Impacts in Nigeria. Available from: [https://www.researchgate.net/publication/229019531\\_General\\_Overview\\_of\\_Climate\\_Change\\_Impacts\\_in\\_Nigeria](https://www.researchgate.net/publication/229019531_General_Overview_of_Climate_Change_Impacts_in_Nigeria) [accessed Sep 04 2018].

- iii. Dalelo, A. (2011). Climate change literacy among postgraduate students of Addis Ababa university, Ethiopia. *Southern African Journal of Environmental Education*, 28, 85-104.
- iv. Ehindero, O.J. (2014). *Intellectual Foundations of Curriculum Development, Implementation and Innovation*. Ogun: Melrose Publishing Company Limited
- v. Intergovernmental Panel on Climate Change [IPCC]. (2007). *Climate change 2007: Synthesis*. Accessed 16/12/17 from [http://www.ipcc.ch/pdf/assessmentreport/ar4/syr/ar4\\_syr.pdf](http://www.ipcc.ch/pdf/assessmentreport/ar4/syr/ar4_syr.pdf)
- vi. Kaufman M. (2018). 2018 is only halfway over, but a troubling climate change trend is already apparent. <https://mashable.com/article/global-warming-trend-nasa-harts/#QPDoTbmTGaqa>
- vii. Khan, Md. Z. A. (2017). Causes and consequences of greenhouse effect & its catastrophic problems for earth. *International Journal of Sustainability Management and Information Technologies*. 3(4), 34-39. doi: 10.11648/j.ijsmi.20170304.11
- viii. Kilinc, A., Stanisstreet, M., & Boyes, E. (2008). Turkish students' ideas about global warming. *International Journal of Environmental & Science Education*, 3(2), 89-98.
- ix. National Research Council (2000). *Grand Challenges in Environmental Sciences*, Committee on Grand Challenges in Environmental Sciences, Oversight Commission for the Committee on Grand Challenges in Environmental Sciences. Washington DC.: National Academy Press.
- x. Nisbet, M. C., & Myers, T. (2007). Trends: Twenty years of public opinion about global warming. *The Public Opinion Quarterly*, 71(3), 444-470.
- xi. Nzokizwa, B. (N.d.). A study of the perceptions of climate change among honours students at two South African universities. Unpublished Master of Arts in Development Studies thesis. Johannesburg: University of South Africa.
- xii. Ogbonna, F. N. (2007). Influence of parental involvement and self -concept on science achievement of junior secondary school students in Ogun State, Nigeria. A Pre-field Research Proposal Presented at Research Seminar of the Institute of Education. Olabisi Onabanjo University, Ago Iwoye.
- xiii. Olasehinde, K. J. and Olatoye, R. A. (2014). A comparative study of public and private senior secondary school students' science achievement in Katsina State, Nigeria. *Journal of Educational and Social Research*, 4(3), 203-207.
- xiv. Oluniyi O. & Aluko O.K. (2012). Curriculum Response to Social Problems in Nigeria. *Journal of Education and Human Development*. 1(1). 31-39.
- xv. Panoy, B. R. P. (2013). Differentiated strategy in teaching and skills development of pupils in elementary science. Master's Thesis. Laguna State Polytechnic University, San Pablo City Laguna
- xvi. Pitpitunge, A.D. (2013). Students' perceptions about climate change. *Asian Journal of Biology Education* 7: 1-10.
- xvii. Santer, B.D., Painter, J.F., Mears, C.A., Doutriaux, C., Caldwell, P., Arblaster, J.M., et al. (2012). Identifying human influences on atmospheric temperature. *Proc Natl Acad Sci* 110(1), 26-33.
- xviii. Skamp K. R., Boyes, E., & Stanisstreet, M. (2009). Global warming responses at the primary secondary interface: 2 Potential effectiveness of education. *Australian Journal of Environmental Education*, 25, 31-44.