

## **Teachers and Students' Perception of Climate Change Dimensions on Teaching/Learning in Secondary Schools, Port-Harcourt Local Government Area, Rivers State.**

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### **Abstract**

*The study investigated teachers and students' perception of climate change dimensions on teaching and learning in secondary schools in Port Harcourt Local Government, Rivers State. Population of the study consisted of all the teachers and students in Port Harcourt local government. Ten public secondary schools are in Port Harcourt local government. However, five public schools were selected for the study with the total population of 373 (teachers) and 2830 (students). The sample size consisted of 961 (teachers and students). The sampling technique utilized was random sampling technique in which 30% of the total populations were selected for the study. A self-made instrument, Teachers and Students Perception of Climate Change on Teaching /Learning Questionnaire (TSPCCTLQ) was developed for the study. Thus, one single questionnaire was developed for the teachers and students. Responses were based on the Likert typed scale (4 point rating) in which the respondents were requested to answer: strongly agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD ) on research questions one and two while in research question 2, the respondents responded to Yes/No question. The data were analyzed using frequency counts, mean scores and t-test. The hypotheses were tested at 0.05 level of significance. The results indicated that severe weather conditions, whirlwind, excessive heat were among climate change dimensions that negatively impact on the teaching and learning. It was therefore concluded awareness be created among the teachers, students and other stakeholders in order to checkmate the negative impact on the teaching and learning. Thus, it is recommended that proper adaptation, mitigation and collaboration among various stakeholders' strategies should be the approach to combat the effects on the teaching and learning.*

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### **Introduction**

Climate change has gained worldwide attention because of its impact and effects on the social, economic, educational, technological and environmental activities. Thus, seminars, workshops and other public discussions have been held and are still being held on how to combat any negative impacts on teaching and learning.

United Nations Framework Convention (2010) attributed climate change to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability. Similarly,

Buhang ,Halvard and Gleditch (2008) as cited in Unamma and Ubochi (2013)conceived climate change as the changing state of the earth temperature and average precipitation..

Education system is feeling the pangs of atmospheric disruptions that challenge academic activities, administrative tasks and effective functioning of institutional programmes. For instance, most of the schools in Rivers State are constantly being flooded during rainy season. Even in the north part of Nigeria, some of the secondary schools are located where they are perpetually affected by whirlwind and sand dust. The resultant effects is the disruption of teaching/learning activities, poor instructional delivery, irregular class attendance, difficulty in maintaining infrastructural materials and other facilities . There are also issues of erosion, flooding, increase rainfall, excessive heat, windstorms, and rainstorms which drastically affected learning processes.

The study therefore assess the impact of climate change dimension on teaching and learning in Rivers State as well as make recommendation on how to combat the consequences on the educational sectional sectors.

### **Review of the Related Literature**

Climate change is a change in the statistical distribution of weather elements and which is sustained for up to a decade or more ( Nwankwo and Unachukwu,2012). In other words, it refers to change generally either directly or indirectly by human activities as well as natural occurrences.

For Nwankwo etal (20120), climate change manifested in two ways: natural(solar radiation mountain building , continental drift) and human activities (greenhouse gases e.g. methane emitted during production of gas and transport of natural gas, oil, coal, nitrous oxide emitted during the combustion of fossil fuels, persistent deforestation, land use and animal agriculture.

Climate change has been identified as a leading human and environmental crisis of the 21st century. The problem of understanding climate change or global warming is one of the major challenges of individual, governments and other stakeholders. Argued has been that climate change leads to acute conflicts and it therefore becomes imperative to achieve a proper understanding of the phenomenon. Higher temperatures, the drying up of soils, increased pest and disease pressure, shifts in suitable areas for growing crops and livestock, increased desertification in the Sahara region, floods, deforestation and erosion are symptoms that pose threats to human activities.

Changes in the atmospheric condition has often confronts education apart from human activities with chaos, complexity and uncertainty. According to International Strategy for Disaster Reduction (2012), in 2010, the Haiti Earthquake took the lives of approximately 4,000 students and 700 teachers and destroyed or damaged 80% of schools in Port-au-Prince and 60% of schools in the South and West Departments. The 2011 Great Eastern Japan Earthquake and Tsunami disaster alone reached an economic cost of approximately US\$235 billion, making it the costliest natural disaster in world history according to the World Bank. The continued loss of human lives linked to avoidable infrastructural collapses and the escalating investment losses in school infrastructures have now become unacceptable. In January 2010, some 38,000 students and 1,300 teachers and education personnel 3 died in Haiti. The Ministry of Education offices were destroyed along with 4,000 schools, close to 80%of educational establishments in the Port-au-Prince area. During the Sichuan earthquake in May 2008,approximately 10,000 students were crushed in their classrooms and more than 7,000 school rooms collapsed.

Changes resulting from climate variations bring with them several challenges with significant negative impacts on educational activities. A typical example is when there is intensity of cloudy atmosphere that reducing visibility, high temperature, green house gases (GHG) emission which resulted from human activities, flooding ,torrent rain accompanied with thunder storm and whirlwind during the examination period(Ogunbameru, Mustapha, and Idrisa, 2013).

Findings from the research of Akuegwu, etal (2012) indicated that climate change effects resulting from excessive heat had a significant relationship with teaching and learning processes in any educational set-up. That is, excessive heat influences the extent of students' response to classroom activities. This implies that when the weather is extreme hot, excessive heat results and even causes bodily discomfort, a state that cannot lead to adequate teaching processes.

In another development, its manifestation is further seen in heavy rain fall with thunder storm that often disrupt academic activities. During harmattan period, the whirlwind with its spurious dust and spiral movement often blow sand stone and dust into the classroom hence disrupting learning processes too. Also, there are cases where the classroom is always flooded hence haul teaching and learning. These episodes are clear manifestation that climate change is not just an environmental, scientific or technological concern, but that it is also impact on education with particular references to teaching and learning practices.

Research findings also indicated that majority of the teachers and students are not aware of the causes and effects of climate change on educational practices in spite of incessant campaign on the needs for proper adaption and mitigation of climatic effects on every facet of human endeavor (Nwankwo et al, 2012). A plausible explanation to the above assertion is that most of the teachers have not really been orientated to understand possible impact of climate changes and how to adapt and mitigate the effects on teaching and learning. This therefore forms the bane of this study.

Similar experiences showed that climate change emanating from windstorms and rainstorms have significant relationship with teaching and learning in the secondary schools. This outcome may be explained from the perspective that windstorms and rainstorms are accompanied by violent winds; thunder and lightning that can blow away roof tops of buildings and destroy other school property, and so render classroom teaching, learning productivity and administrative responsibilities redundant. Due to devastating impact of climate change, there has been clarion call from government, researchers, non governmental agencies and other stakeholders to find ways of mitigating the climate change dimensions in other to improve human activities. The target is to formulate policies, creating awareness by linking with public agencies, private sector and civil society to build a strong climate change mitigation and adaptation strategies.

Climate change dimensions required certain measures to checkmate risk and disaster that accompanied it. For instance, one of the measures is adaptation. In this context, adaptation implies the capacity to understand the effects of climate change. Adaptation is relevant for all climate sensitive domains including a **education (Fussel,2007)**. Enhancing adaptive capacity is a way of reducing vulnerabilities and promotes sustainable improvement in teaching and learning activities. However, adaptation usually depended on factors such as: information, technology, skills infrastructures, access to resources and management capabilities.

Also, mitigation is also used to check the impact of climate change. Mitigation depicts refers to measures that may either reduce the increase in green house emissions or increase terrestrial storage of carbon (Oladipo,2010). Effective climate change education is therefore requires for the development of new knowledge and understanding of teachers and learners in the education sector. In short, based on the impact, some schools of thoughts have advocated for teaching of climate in the university. This is because of the observation that there is a disconnect between actual climate science knowledge and perceived knowledge (Dupigny-Giroux, 2008).

## **Statement of the Problem**

The issue of climate change has generated worldwide contention as agencies, educators, government etc has consistently organized workshops, conferences and seminars on the process of mitigation and adaptation. It is certain that the impact of climate change does not only affect the environment but its impact is felt on the technology, culture, political environment as well as educational practices.

Teaching and learning is reflected on the extent in which the environment of class room is favorable to attract the attention of the learners. The teacher may have prepared an admirable lesson objectives for the day but such preparation are often disrupted by the sudden advent of climate change. For instance, change in the weather in respect of heavy down pour, cloudy atmosphere that does not allow visibility, whirlwind and stormy weather, high temperature accompany with unbearable heat in the classroom, heavy flooding that alter the possibility of learning etc often affect the level of teaching and learning in the school system.

Therefore, the researchers intend to investigate teachers and students' perception of climate dimensions on teaching/learning in secondary schools in Port-Harcourt Local Government Area, Rivers State.

## **Research questions**

1. What are the perceptions of teachers and students on climate change dimensions in secondary schools?
2. What are the nature of climate change dimensions on teaching and learning in secondary schools?
3. What are the strategies of combating climate change impact on teaching and learning in secondary schools?

## **Hypotheses**

1. There is no significant relationship between teachers and students perception of climate change dimensions on teaching /learning in secondary schools.
2. There is no significant relationship between teachers and students opinions on the strategies of combating impact of climate change on teaching and learning in secondary schools.

## **RESEARCH METHODOLOGY**

The study used survey design. There are ten public secondary schools in Port Harcourt local government. However, five public schools were selected for the study with the total population of 373 (teachers) and 2830 (students). The sample size consisted of 961 (teachers and students). The sampling technique utilized was random sampling technique in which 30% of the total populations were selected for the study.

A self-made instrument, Teachers and Students Perception of Climate Change on Teaching /Learning Questionnaire (TSPCCTLQ) was developed for the study. Thus, one single questionnaire was developed for the teachers and students. Responses were based on the Likert typed scale (4point rating) in which the respondents were requested to answer: strongly agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).

The researchers in collaboration with the teachers administered the questionnaires to the respondents. Thus, 961copies of the questionnaires were distributed and retrieved 594(62%) for the analysis of the research questions and hypotheses.

Frequency counts, mean scores and descriptive tables were used for the data analysis while t-test was used for the hypotheses.

### Results:

#### Research question 1: What are the perceptions of teachers and students on climate change dimensions in secondary schools?

Table 1: Mean scores responses on perception of teachers and students on climate change dimensions (N=594).

S/No	ITEMS	SA	A	D	SD	STD	$\bar{X}$	REMAKRS
1	Precipitation disrupt teaching and learning activities	224	288	45	37	0.8	3.2	Accepted
2	Several cool Preventing students and teachers from coming to school.	109	393	63	29	0.7	3.0	Accepted
3	Whirlwind contribute to low performance by the students during examination	102	121	141	230	1.1	2.2	Rejected
4	Excessive heat Frustrate students participation in learning objectives	133	306	88	67	0.9	2.9	Accepted
5	Instructional materials cannot be adequately used due lack of visibility.	147	257	101	89	1.0	2.8	Accepted

Table 1: shows that out of the five (5) items, four (4) were accepted as possible perception of teachers and students on climate change dimension in teaching and learning. The mean rating was: disrupt teaching and learning activities (3.2), followed by preventing students and teachers from coming to school (3.0). Contribution to low performance by the students during examination (2.2) was rejected by the respondents. In addition, the respondents accepted that climate change frustrate active participation of students in learning activities as well as affecting the used of instructional materials due lack of visibility (2.8).

#### RESEARCH QUESTION 2: What are the nature of climate change dimensions on teaching and learning in secondary schools?

Table 2: percentages responses on the nature of climate change on teaching and learning (N=594).

S/NO	ITEMS	YES (%)	NO (%)
1	Flooding	401(67.5%)	193(32.5%)
2	Windstorm and whirlwind	345(58.1%)	249(41.9%)
3	Pollution that changes the air of the environment	421(70.9%)	173(29.1%)
4	Rainstorm with awful thunder and lightning	387 (65.2%)	207(34.8%)
5	Excessive heat and greenhouse gases	369(62.1%)	225(37.9%)

The above table 2: indicates that the respondents subscribe to all the items as the nature of climate change dimensions that impact on the teaching and learning in the secondary schools.

#### Research 3: What are the strategies of combating climate change impact on teaching and learning in secondary schools?

Table 3: Responses on strategies of combating climate change impact on teaching and learning (N=594).

S/NO	ITEMS	SA	A	D	SD	STD	$\bar{X}$	REMAKRS
1	Creating awareness for adaptation in the class	120	115	202	157	1.1	2.3	Rejected
2	Enlightenment on appropriate form of mitigation	128	135	208	123	1.0	2.5	Accepted
3	Educating the students on adaptation to climate change	114	273	98	109	0.9	2.7	Rejected
4	Orientating teachers and students on disaster and risk of climate change	132	200	118	144	1.1	2.8	Rejected
5	Organization of workshops, seminars and conferences	112	248	112	122	1.0	2.7	Rejected

Table 1: shows that the respondents accepted that the strategies are: orientating teachers and students on disaster and risk of climate change (2.8), Educating the students on adaptation to climate change and Organization of workshops, seminars and conferences (2.7) respectively. Statistically, it also shows that enlightenment on appropriate form of mitigation was accepted with mean score of (2.5).

### Test of hypotheses

**HO<sub>1</sub>:** There is no significant relationship between teachers and students perception of climate change dimensions on teaching /learning in secondary schools.

Table 4: t-test on perception of teachers and students on climate change dimension

Respondents	N	$\bar{X}$	std	df	t-cal	t-value
Teachers	227	14.1	4.9	592	0.58	1.96
Students	367	14.2	5.0			

$p > 0.05$  (Not significant)

The result of the above table 4 shows that t-cal (0.58) is less than t-value (1.96) at degree of freedom (592) and 0.05 level of significance. This implies that the hypothesis which states that there is no significant relationship between teachers and students perception of climate change impact on teaching /learning in secondary schools is not rejected. By implication, teachers and students perceived climate change dimension in the same way.

**HO<sub>2</sub>:** There is no significant relationship between teachers and students opinions on the strategies of combating impact of climate change on teaching and learning in secondary schools.

Table 5: t-test for the strategies of combating impact of climate change on teaching and learning.

Respondents	N	$\bar{X}$	std	df	t-cal	t-value
Teachers	227	13.5	5.3	592	0.73	1.96
Students	367	14.4	4.9			

$p > 0.05$  (not significant)

The result of the above table 5 shows that t-cal (0.73) is less than t-value (1.96) at degree of freedom (592) and 0.05 level of significance. The implication is that the hypothesis which states there is no significant relationship between teachers and students opinions on the strategies of combating impact of climate change on teaching and learning in secondary schools is not rejected. This means that teachers and



students have the same opinions on the strategies on the strategies of combat climate change dimension in secondary schools.

## DISCUSSION OF FINDINGS

The result of hypothesis one revealed that no significant relationship between teachers and students perception of climate change dimensions on teaching and learning in secondary schools. This is not surprised as respondents are aware that when the weather condition is inclement, classroom activities are often in disarray. Analyzing individual items on table 1 there is also a strong indication that teachers and students in the study subscribed to the fact that climate change dimensions have impact on the teaching and learning. This findings agreed with observation of Fussel (2007) who stated that climate change precipitation disrupt teaching and learning activities especially when it is accompanies with thunder storm often disrupt academic activities. Severe cool preventing students and teachers from coming to school especially during the rainy season or harmattan period when the whirlwind with its spurious dust and spiral movement often blow sand stone and dust into the classroom hence disrupting learning processes too.

Excessive heat frustrates students' participation in learning objectives according to the findings. This claims agreed with the perception of Akuegwu, etal (2012) who stated that excessive heat had a significant relationship with teaching and learning processes in any educational set-up. That is, excessive heat influences the extent of students' response to classroom activities

Evidence from the data analysis suggested that instructional materials cannot be adequately used due lack of visibility. This is particularly noticed when the atmosphere is very dusty or when the there is a thick cloud that prevent clear vision. In this case, the use of instructional materials is not possible in the teaching and learning conditions.

It is furthered disclosed from the outcome of this study that climate change dimension is notice in respect flooding emanated from violent and horrendous rainfall. Without any exaggeration , the recent erosion and flooding in many parts of Nigeria especially in Rivers State also had a terrible effect on the affected communities making teaching and learning tasking. Also noticing is the impact of windstorm and whirlwind which has caused a lot of dilapidation in several secondary schools. In other words, most of the school buildings have buildings have been destroyed by removing the roof tops rendering the activities of teaching and learning redundant (Akuegwu, etal (2012).

The study suggested the respondents accepted that pollution changes the air of the environment especially where human activities. For instance, the cases of emissions from bush burning, fossil fuel combustion from oil exploration and exploitation, ozone depletion are facilitated by human beings(Oladipo,2010). In fact, scientists have warned that human activities such as burning greenhouse gases in particular could have irreversible, damaging effects on ozone layer and contribute to warming the earth's atmosphere.

Findings on question three indicated that teachers and students are not aware of the needs for adaptation in the class. From experience the students and teachers are not educated on the processes of adaptation but within them they understand the needs for it. More so it is identified that there is no enlighten on appropriate form of mitigation or creating an avenue that Links of teachers and students to understand disaster and risk of climate change through training through Seminars / Workshops/conferences.

## Conclusion

The study has certainly shown that climate change has great impact on the teaching and learning in the school system. Even though teachers and students are aware of the impact on the environment, technology, social and political life, they are still ignorance of the impact on the teaching and learning as most of the studies are devoid of its effect on the classroom activities. Negative impact of climate change

is prevalent in all situations in human life hence, there is every tendency for all the stakeholders to collaborate to checkmate dimension of challenges of climate change in the educational system apart from focusing in other sectors.

### **Recommendations**

The following recommendations were made:

- Creating awareness for the management, teachers and students to understand the impact of change in climate on the educational system.
- Advocate for proper adaptation and mitigation of climatic effects on the educational system.
- Government agencies should intermittently organize workshops/conferences on the effect of climate change.
- Climate change should be offered as a course for adequate enlightenment.

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