



## Evaluating the Effects of Information Literacy on Climate Change Awareness among Students in Imo State University

N. Patricia Duru<sup>1</sup> and C. Faisal Emetumah<sup>1\*</sup>

<sup>1</sup>Department of Geography and Environmental Management, Imo State University, P.M.B. 2000, Owerri, Imo State, Nigeria.

### Authors' contributions

This work was carried out in collaboration between both authors. Author NPD managed the protocol, literature searches, conclusions and recommendations of the study. Author CFE designed the study, analyses and also wrote the first draft of the manuscript. Both authors read and approved the final manuscript.

### Article Information

DOI: 10.9734/ACRI/2016/27186

Editor(s):

- (1) Mohammad Reza Shadnam, R&D Practice, KPMG, Canada.  
(2) Sivakumar Manickam, Department of Chemical and Environmental Engineering, The University of Nottingham Malaysia Campus, Malaysia.  
(3) Wang Mingyu, School of Metallurgy and Environment, Central South University, China.

Reviewers:

- (1) Kabi Prasad Pokhrel, Tribhuvan University, Nepal.  
(2) R. K. Aggarwal, Dr Y S Parmar University of Horticulture & Forestry, Nauni, India.  
Complete Peer review History: <http://sciedomain.org/review-history/15307>

Received 23<sup>rd</sup> May 2016

Accepted 28<sup>th</sup> June 2016

Published 7<sup>th</sup> July 2016

Original Research Article

### ABSTRACT

The 21<sup>st</sup> century ushered in the information age which in alignment with technology, has made access to information easier and faster than the world has ever seen. However, information is only beneficial when its articulate form is appropriately directed at those that need it the most; that is what information literacy is all about. The reality of climate change and its impact on our everyday lives point to the pertinence of having lucid information which will in turn create more awareness on climate change. Reviewed literatures suggest that even though a lot of information is available on climate change issues, there are still significant gaps in the perception of the concept by many segments of human society, particularly in the developing world. The aim of the study is to determine how information literacy affects awareness on climate change issues among students in Imo state university. Survey method involving questionnaires was used in gathering primary data from a study population of 20,000 undergraduate students, from which samples of 392

\*Corresponding author: Email: [fc.emetumah@imsu.edu.ng](mailto:fc.emetumah@imsu.edu.ng);

respondents were purposively and randomly selected. Analysis of the study results produced vital findings: 37.8% of the respondents get information on climate change issues mostly from the internet which was also seen by 53.6% of the respondents as the most accessible information source. While about 60% of the respondents both strongly agreed and agreed that climate change positively affects Nigeria's economy, 35% did not have any opinion on whether or not climate change aggravates expanding deserts worldwide. The study concludes that though technology and the internet are very important in sourcing information on climate change issues, the quality and the ability of the respondents to understand that information is subjective. The study recommends more awareness creation on climate change issues through public participation and technological tools.

**Keywords:** Climate change; information literacy; students; awareness.

## 1. INTRODUCTION

At the tail end of the 20<sup>th</sup> century, the concept of climate change was still very much hypothetical and speculative; many stakeholders in both government and private sectors thought it was a 'false alarm' and a pigment of the imagination its proponents. Nonetheless, the Rio earth summit of 1992 provided the platform for many world leaders to reach a consensus on the way forward in fostering environmental sustainability [1]. Despite many distractions at the conference, the United Nation Framework Convention on Climate Change (UNFCCC) was conceived at the side lines of that earth summit. A few years later when the 1997 climate change conference in Kyoto Japan which culminated into the "Kyoto protocol" was taking place, many world leaders were unenthusiastic about taking climate change serious; some perceived climate change as a hindrance to meeting their economic growth targets [2]. Their counterparts from many developing countries were keen to key into the "booty" offered by the Kyoto mechanisms (International Emissions Trading, Clean Development Mechanism (CDM) and Joint implementation (JI)) which allowed developing countries to meet their emission targets by making investments in zero to low carbon emission projects [3]. These days, many experts in both government and business circles have realized that climate change has many malevolent impacts; low crop yield and increase in the malaria epidemic [4]. Therefore, urgent and effective actions have to be taken in order to ameliorate these impacts. UNFCCC became effective in 1994 and has been ratified by most United Nation (UN) member countries; it is solely aimed at reducing Greenhouse gases (GHGs) in the atmosphere to a level that the earth's climate does not become pernicious to human growth and economic development [3]. According to Olaniyi et al. [5], climate change is disrupting

agriculture particularly farming activities due to irregular weather patterns in many important cropping belts of Nigeria. These weather disruptions are very pernicious because agrarian families in many parts of Nigeria depend on seasonal rainfall for growth in the fields they cultivate [6]. In the same vein, Bello et al. [7] posits that government expenditure on agriculture from 1977 to 2005 ranged from between 1.8% to 6%, of the cumulative annual federal capital budgets of that period. This paltry budgetary allocation for agriculture spells doom especially when juxtaposed with the drop in the price of crude oil which is still the main stay of the Nigerian economy. Rise in sea levels is also attributable to climate change; Nigeria's coastal areas have witnessed sea level increment of almost one foot in the past five decades with simulations indicating that the increment could be as high as three feet within the next nine decades [8]. Similarly, Burke et al. [9] posit that increasing global temperatures might significantly reduce the GDP of many tropical countries by over 75% in 2100. However, the current economic slowdown in many economies in the industrialized world could be a panacea to reducing global CO<sub>2</sub> emission; the example of China provides a clearer picture of the issues. Air quality is very poor in many Chinese cities due to high industrial activities and vehicular traffic in urban centers [10,11]. Therefore a slowing Chinese economy implies that many heavy industries will have to shut down thereby reducing losses and at the same time also reduce CO<sub>2</sub> emission. In 2015, China witnessed about 4% decrease in the utilization of coal which was pertinent to the 1-2% reduction in her total CO<sub>2</sub> emission [12]. This Chinese reduction in emissions has resulted in significant increment in renewable energy installations in the country. Wind and solar energy facilities installed in 2015 stood at 32.5 and 18.3 gigawatts (GW) respectively [13]. Little wonder why China was

ready to partner with other major polluters in signing the Paris 21st Conference of Parties (COP21) agreements in December 2015.

In Nigeria, the governments' response to CO<sub>2</sub> emissions and the changing climate is the mandate of the department of climate change (DCC) at the Federal Ministry of Environment [4]. As a developing country, activities of the Nigeria DCC are centered on keying into the Kyoto mechanisms particularly CDM program. In as much as the renewable energy policy of the government seems apposite and laudable, it is worthy of note that Nigeria still flares enough natural gas which can generate significant power for industrialization if adequate infrastructure were available to harness it.

### **1.1 Climate Change Awareness and Information Literacy**

Climate change awareness is very crucial to implementing the various framework agreements world leaders have made; it will also help the citizenry to understand all the critical issues involved and most importantly the role they must play in the entire process. Climate change awareness is the platform through which more information can be accessed on the processes that exacerbate climate change. However, the level of awareness depends on the source and accessibility to relevant climate change information. Al-Buloshi & Ramadan [14] conducted a study on public perception on climate change awareness in Oman and identified that media coverage provides a very acceptable source of information on climate change issues. These perceptions are also shaped by natural disasters that occur in the locality which serve as examples of the impact of climate change on the populace. Several studies have been undertaken on climate change awareness, perception and impacts in several countries across the globe [15-20]. However, literature on climate change awareness does not explicitly expound the role information literacy plays in ensuring the right information is provided to those who need and understand that information. According to Limberg et al. [21] information literacy simply entails the ability of an individual or group to utilize information in surmounting difficulties by retrieving, thoroughly examining and evaluating that information before use; it implies utilizing information so that quality of life can be increased and also foster corporation between nations and continents. Information is learned or assimilated over time.

Therefore, being knowledgeable about a particular subject depends on whether a learning process or activity is undertaken and that the right conditions are provided. Information literacy involves making sure that whatever use we intend to put information does not create socio cultural imbalances, violate the laws of the land and also corruption free [21]. Limberg et al. [21] proposed three theoretical perspectives on information literacy: Phenomenographic view which centers on variation in learning, socio cultural view that looks at the importance of cultural tools in effective learning and the discourse analytic perspective which looks how engagements and vitals discussions that can produce information synergy. A Nigerian university student is expected to be literate especially on the use of information technology tools that facilitate information literacy; the process for writing matriculation examinations into Nigerian tertiary institution is now ICT based. In addition, a university student is presumed to be literate having passed through examined primary and secondary education. Thus Information literacy is a panacea to climate illiteracy; it is when people are informed that they can understand what climate change is all about. Climate literacy requires many facets so that we can understand it better. Miléřa & Sládeka [22] in proposing a curriculum for climate literacy post primary education asserts that awareness and literacy on climate change issues require a multi-faceted approach that covers scientific, environmental and media perspective in order to meet its objectives of making young people understand climate change.

### **1.2 Access to Information in Nigeria**

In Nigeria, technology is fundamental to how people access and source information especially on issues that concern climate change. Familusi & Owoeye [23] deduced that radio was the most accessible information source for Nigerian students, followed by mobile phone, television and newspapers. However, social media platforms have made access to the internet a very vital information source. Mobile phones are a very important access point to the internet in Nigeria; mobile technology can facilitate awareness creation and learning especially among university students in Nigeria [24]. However, Ezemenaka [25] reminds us that while mobile technology can enhance the learning process among Nigerian university students, it can also serve as a distraction depending on what use it is put to. In Nigeria, mobile

technology provides a very critical access to the internet due to poor broadband accessibility [26] and inadequate power supply to meet the needs of a population approaching 170 million [27]. Therefore, it makes more sense to connect to the internet through a mobile phone whose battery can last for long hours after a single charge thus providing more time to spend on the internet. As at February 2015, 93% of Nigerians who had access to the internet did so using mobile phones [28]. In the same vein, information available on the Nigeria Communication Commission (NCC) website indicates that Nigeria had about 149 million mobile phone subscribers as at January 2016 [26].

## 2. METHODOLOGY

The overall aim of the study is to evaluate how climate change awareness among students in Imo state university is affected by information literacy. In order to do this, the study will determine the level of understanding about what climate change is in the study area; ascertain the most common sources of information on climate change issues and identify whether the respondents understand how climate change affects them. Imo state university is an urban university in Owerri town which is situated between latitude 5° 57' 1" and 5° 10' 1" North and longitude 6° 36' 1" and 7° 28' 1" East on the south eastern part of Nigeria. The university has a population of over 30,000 including students, academics, non-academics and members of the public who either earn a living in the university environment or visit the area regularly. A unique factor about the university environment is that there are no on-campus hostels; students reside outside the university premises or in different parts of Owerri urban. There are 11 faculties in the university; with over 35 accredited departments where undergraduate students are admitted every new session.

Questionnaire survey method was used in gathering primary data which was analyzed using descriptive statistics. In order to achieve the research aim, many Likert scale type questions were used to gather empirical data required for the study. The questions in the questionnaire were themed from the study objectives. Likert scale was used because assessing the level of climate change awareness given that the respondents are information literate, would have to involve ranking some of the opinions provided by respondents. The population of the study (N) was the 20,000 undergraduate students in Imo

state University as at the first semester, 2015/2016 session. The population was selected for the study because the importance of young people in Nigeria cannot be over emphasized; while 44% of Nigerians are less than 15 years, 43% of the entire Nigerian population lies between the ages of 15 and 49 [1]. In order to derive the appropriate sample size (n), Slovens formula was used at a confidence level of 95%. The 0.05 margin of error (e) was utilized in calculating the sample size using the formula:  $n = N / (1 + N e^2)$ . The questionnaire designed for the study was distributed to 392 respondents who were randomly selected from the various faculties and departments in Imo state university. It took about 3 weeks to distributed and receive filled out questionnaires; this was concluded by January 2016. Out of the 392 questionnaires distributed, 384 questionnaires were returned and used for analysis. IBM SPSS 20 and Windows Excel 2007 were used in describing and analyzing data gathered for the study.

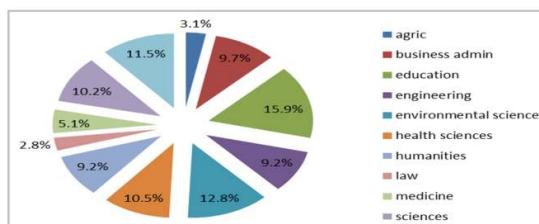
## 3. RESULTS AND DISCUSSION

Fig. 1 shows the distribution of respondents according to the faculty they are undertaking their studies. The faculties of education and environmental sciences accounted for the highest number of respondents with 15.9% and 12.8% respectively, while the faculties of law and agriculture had the lowest number of respondents with 2.8% and 3.1% respectively. Fig. 2 gives the gender demographics of the respondents; the ratio between the genders is quite close with the female respondents accounting for 52.7% while 47.3% represents male respondents.

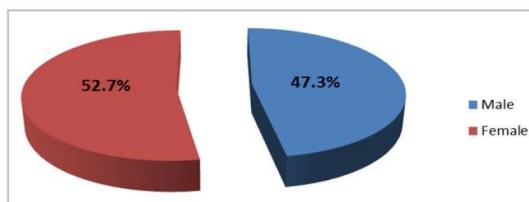
Table 1 contains statements made in the questionnaire to which respondents had to indicate their level of agreement. The scale of agreement in this table is ranked 1 to 5 ascending order indicating concurrence. Respondents answers to 1i) indicates that while a total of 216 (56.2%) respondents agreed with the statement, 85 (22.1%) respondents disagreed with the statement and 83 (21.6%) had no opinion about the statement. Under item 1ii) 171 (44.5%) respondents agreed with the statement, a total of 90 (23.5%) respondents disagreed while 123 (32%) had no opinion on the statement. With more respondents disagreeing and not having opinion about the statement (55.5%) implies that more respondents do not really understand the relationship between climate change and melting glaciers as opposed

to those who do (44.5%). On item 1iii) 154 (40.1%) respondents had no opinion about climate change exacerbating the drying up of Lake Chad; 152 (39.6%) agreed with the statement while 78 (20.3%) respondents disagreed. With more responses to 1iii) disagreeing and not having any opinion on the statement (60.4%) infers that most of the respondents do not understand that climate change can aggravate the drying up of the Lake Chad, an important water source to surrounding communities.

Table 2 illustrates data collected from respondents on availability and accessibility of climate change information. Under item 2i), most of the respondents (74.8%) retrieved climate change information from the internet (37.8%) and from television (37%). 28 (7.3%) respondents got information mostly from the radio while 56 (14.6%) got climate change information mostly from word of mouth; only 13 (3.4%) respondents got climate change information mostly from newspapers. In item 2ii), respondents indicated their most accessible information source; 206 (53.6%) respondents indicated that the internet is their most accessible information source. This is followed by television (18.8%), word of mouth (13%), radio (8.6%) and newspaper (6%). This trend is in line with the technology information revolution, especially when we realize that young people are accessing the internet intensely due to the advent of social media platforms.



**Fig. 1. Distribution of respondents according to faculty**



**Fig. 2. Gender distribution of respondents**

Table 3 illustrates statements which require respondents to specify their responses to the corresponding level of agreement. The statements are structured in such a way that level of concurrence is indicated in a descending order with the most negative response implying the best agreement. The essence of this reverse coding is to ensure that climate change awareness among respondents is assessed thoroughly. Under item 3i), a total of 229 (59.6%) respondents agreed that climate change positively affects economic output in Nigeria while only a total of 97 (25.3%) respondents disagreed with this statement; 58 (15.1%) did not have an opinion about the statement. Respondents' position on item 3i) disagrees with literature which points to the negative economic effects of climate change for tropical countries like Nigeria (Burke et al. [9]). Responses to item 3ii) show that while a total of 143 (37.2%) respondents disagreed with the statement that climate change is good development for planet earth, 164 (42.7%) respondents agreed with the statement; 77 (20.1%) respondents do not have an opinion about the statement. Item 3iii) assessed whether climate change information available to the respondents were sufficient; a total of 203 (52.8%) respondents agreed with this statement, 107 (27.9%) respondents disagreed and 74 (19.3%) did not have any opinion on the statement in question. Item 3iv) appraised responses on whether or not expanding deserts are not aggravated by climate change; a reasonable number of respondents (35.5%) did not have any opinion on the statement; this point to deficiencies in climate change awareness among students involved in the study. This observation asserts the need for more climate change information to be made available for students as literature supports the assertion that climate change worsens desertification among others [8].

Fig. 3 relates climate change awareness with source of information on climate change issues. While about 45% of the respondents strongly agreed that climate change is exacerbated by human activities, about 26% did not agree with this statement. Similarly, about 14% did not have any opinion about climate change exacerbation by human activities. Furthermore, the figure shows that 157 (about 41%) of the 383 respondents agreed that the internet is the best source of information about climate change issues. This quite conforms to literatures which assert the importance of mobile phones and internet accessibility in Nigeria [24,26,28].

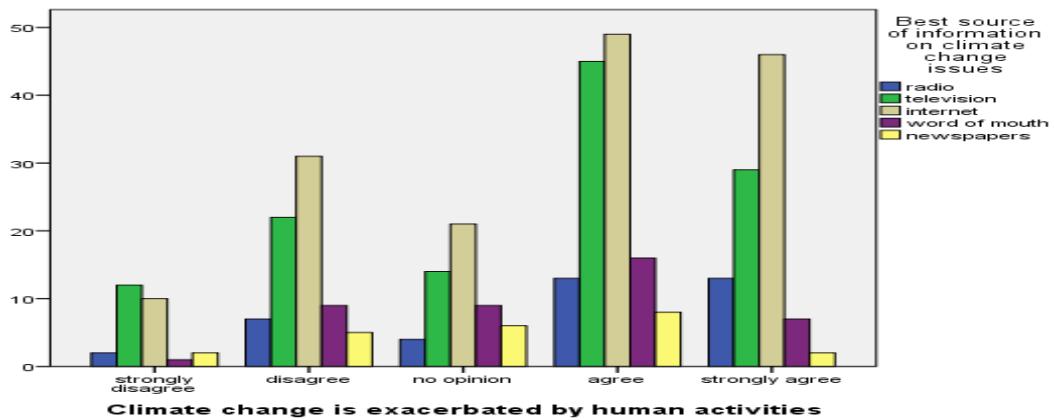
**Table 1. Assessing climate change awareness among respondents (Ascending order)**

Statement	Scale of agreement*				
	SA = 5	A = 4	NO = 3	D = 2	SD = 1
1i). Increase in global mean temperature is a fundamental consequence of climate change	75 19.5%	141 36.7%	83 21.6%	57 14.8%	28 7.3%
1ii). Climate change has a direct relationship with melting glaciers in the north and south poles	53 13.8%	118 30.7%	123 32.0%	66 17.2%	24 6.3%
1iii). The drying up of the Lake Chad is as a result of climate change	41 10.7%	111 28.9%	154 40.1%	57 14.8%	21 5.5%

\*SA = strongly Agree, A = Agree, NO = No Opinion, D = Disagree, SD = Strongly Disagree

**Table 2. Availability and accessibility of climate change information**

Statement	Categorization				
	Newspaper	Word of mouth	Internet	Television	Radio
2i). I get information on climate change mostly from one of the following	13 3.4%	56 14.6%	145 37.8%	142 37.0%	28 7.3%
2ii). Most accessible information source	23 6.0%	50 13.0%	206 53.6%	72 18.8%	33 8.6%



**Fig. 3. Relating climate change awareness with information source for climate change issues**

**Table 3. Assessing climate change awareness among respondents (descending order)**

Statement	Level of agreement*				
	SA = 1	A = 2	NO = 3	D = 4	SD = 5
3i) Climate change positively affects economic output in Nigeria	75 19.5%	154 40.1%	58 15.1%	64 16.7%	33 8.6%
3ii) Climate change is a good development for planet earth, our home	42 10.9%	122 31.8%	77 20.1%	78 20.3%	65 16.9%
3iii) The information I get on climate change is substantial and sufficient	67 17.4%	136 35.4%	74 19.3%	74 19.3%	33 8.6%
3iv) Expanding deserts worldwide are not aggravated by climate change	24 6.3%	87 22.7%	139 35.5%	92 25%	42 10.5%

\*SA = strongly Agree, A = Agree, NO = No Opinion, D = Disagree, SD = Strongly Disagree

Fig. 4 depicts the relationship between climate change information sufficiency and knowing exactly what can be directly caused by climate change. A crosstab between the two variables in Fig. 4 indicates that while 165 (43%) stated that increasing sea levels are directly caused by climate change, 120 (31.2%) thought the increase in GDP is directly caused by climate change. Respondents' thinking that climate change increases GDP disagrees with Burke et al. [9] who assert that climate change will significantly reduce GDP of tropical countries like Nigeria by over 75% by the end of the century. Furthermore, a total of 239 (62.2%) both strongly agreed and agreed that more climate change information should be provided for students. Due to the significant percentage (48.2%) of respondents who did not agree that increasing sea levels is directly caused by climate change, it is pertinent that more information about climate change issues should be made available for students.

Table 4 shows a cross tabulation between two items: Respondents aware of COP21 and the corresponding medium of awareness. The essence of this cross tabulation is to help us not only in understanding the level of information literacy amongst the respondents, but also in ascertaining the information medium most used by respondents. In doing this, the authors are working with the assumption that being aware of COP21 which held in Paris, France in 2015 is an indication of awareness by the respondents on climate change issues. Data gathered shows that only 156 respondents out of a total of 237 were aware of COP21. Out of the 156 respondents, while 72 (46.2%) and 42 (26.9%) got the information from the internet and television

respectively, 21 (13.4%) and 11 (7%) heard about it from word of mouth and newspapers respectively. Only 10 (6.5%) respondents heard about COP21 from the radio. This shows the importance of technology especially the internet on climate change awareness.

### 3.1 Hypotheses Testing

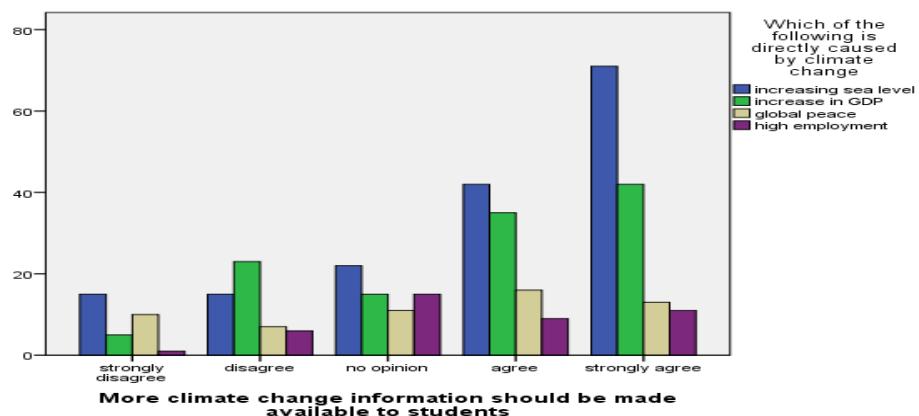
Two hypotheses were made for the study and will be tested using the Chi square ( $\chi^2$ ) test of independence and homogeneity:

**Hypothesis a ( $H_0_a$ ):** There is no significant relationship between the level of climate change awareness and the source of getting information.

**Hypothesis b ( $H_0_b$ ):** There is no significant relationship between knowing what can be directly caused by climate change and whether one gets sufficient information on climate change issues.

#### 3.1.1 Testing $H_0_a$

Significance level of 5% (Alpha,  $\alpha = 0.05$ ) will be used in testing this hypothesis. We reject  $H_0_a$  if the  $P$  value is less than  $\alpha$ ; a result above  $\alpha$  indicates that  $H_0_a$  will be accepted. The Chi Square tests result for testing  $H_0_1$  shows that  $P$  value at 16 degrees of freedom is .53 so we accept  $H_0_a$  that there is no significant relationship between the level of climate change awareness and the source of getting information. This is consistent with literature which posits that information sources assumed to be most effective may not be so [25]; this



**Fig. 4. Relating climate change information sufficiency with climate change literacy**

**Table 4. Respondents who are aware of COP21 \* medium used in getting information about COP21 cross-tabulation**

	Medium of awareness about COP21					Total
	Radio	Television	Internet	Word of mouth	Newspapers	
Respondents aware of COP21	10	42	72	21	11	156
Total	10	42	72	21	11	156

demonstrates that what matters most in climate change literacy are the quality and effectiveness of information received and not the source through which the information was received. Little wonder why Familusi & Owoeye [23] asserted that radio is the most accessible information source for Nigerian students, despite increased access to the internet through mobile phones.

### **3.1.2 Testing H<sub>0b</sub>**

Level of significance of 5% (Alpha,  $\alpha = 0.05$ ) will also be used in the hypothesis testing.  $H_{0b}$  is rejected if the  $P$  value is less than  $\alpha$ ;  $H_{0b}$  is accepted if the  $p$  value is more than  $\alpha$ . The Pearson Chi Square tests values correspond to an asymptotic significance ( $P$  value = .000) which is less than  $\alpha$  therefore we reject  $H_{0b}$  and conclude that there is significant relationship between knowing what can be directly caused by climate change and whether one gets sufficient information on climate change issues. This means that knowing what exactly is caused by climate change is dependent on whether or not you get sufficiently informed.

## **4. CONCLUSIONS AND RECOMMENDATIONS**

The relevance of information literacy in climate change awareness is very clear especially when we recognize that it is only when we are 'adequately' informed that we can understand exactly how climate change affects our daily lives. Current trends suggest that many world leaders have now realized that climate change is real and are making efforts through the UNFCCC so as to reduce GHGs emission as far as reasonably practicable. Respondents in the study are university students who are literate members of the Nigerian society; their perception on climate change awareness should be affected by their information literacy level. Results analyzed and hypotheses tests can be used in making vital conclusions: though information sources are very important in accessing climate change awareness, what matters most is the quality of

the information provided; climate change awareness depends on whether or not information provided was sufficient; technology particularly accessing the internet through mobile phones is very important in climate change awareness among students in the study area.

Students should be encouraged to take part in campus campaigns on climate change awareness. This is essential because it enables them to create a consciousness within their immediate environment, about the effects of climate change on our daily lives. Annual events and symposia to commemorate important days like "world environment day", "world meteorological day" among others, should be organized for so that awareness creation on climate change issues can be done. Climate change education should become an integral part of the university system. As part of the general studies curriculum, modules on environmental issues should be included especially for 1st year students; this will go a long way in increasing environmental consciousness among students in particular and young Nigerians in general. Technological tools should be utilized in improving information literacy among students. Students in computer science and related disciplines should look at developing software applications that can be used in understanding everyday environmental transformations. Market potential for these kinds of products is huge considering that most Nigerians are young people.

## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

## **REFERENCES**

1. Rio+20 Nigeria Report. Nigeria's path to sustainable development through green economy: Country Report to the Rio + 20 Summit, June Rio de Janeiro, Federal Government of Nigeria; 2012.
2. Lomborg B. The skeptical environmentalist: Measuring the real state

- of the world. Cambridge: University Press; 2003.
3. UNFCCC. The United Nations Framework Convention on Climate Change: The Convention; 2014. Accessed 19 March 2016 Available:[http://unfccc.int/essential\\_background/convention/items/6036.php](http://unfccc.int/essential_background/convention/items/6036.php)
  4. Abiodun BJ, Salami AT, Tadross M. Climate change scenarios for Nigeria: Understanding biophysical impacts. Climate systems analysis group, cape town, for building Nigeria's response to climate change project. Ibadan, Nigeria: Nigerian Environmental Study/Action Team (NEST); 2011.
  5. Olaniyi OA, Ojekunle ZO, Amujo BT. Review of climate change and its effects on Nigeria ecosystem. *Int. J African & Asian Studies.* 2013;1.
  6. Onyenechere EC. Climate change and spatial planning concerns in Nigeria: Remedial measures for more effective response. *J Human Ecology.* 2010;32(3): 137–148.
  7. Bello OB, Ganiyu OT, Wahab MKA, Afolabi MS, Oluleye F, Ig SA, et al. Evidence of climate change impacts on agriculture and food security in Nigeria. *Int. J Agric & Forestry.* 2012;2(2):49-55.
  8. Sayne A. Climate change adaptation and conflict in Nigeria: Special Report United States Institute of Peace Washington, DC; 2011.
  9. Burke M, Hsiang SM, Miguel E. Global non-linear effect of temperature on economic production. *Nature.* 2015;527: 235–239.
  10. Wu DA, Yuan XB, Shiqiu ZA. Will joint regional air pollution control be more cost-effective? An empirical study of China's Beijing Tianjin Hebei region. *J Env. Mgt.* 2015;149:27 36.
  11. Parrish DD, Zhu T. Clean air for megacities. *Science. Magazine* Vol. 2009; 326:674-675.
  12. Greenpeace. China's CO<sub>2</sub> emissions continued to fall in 2015 – Greenpeace Response; 2016. Accessed 5 March 2016 Available:<http://www.greenpeace.org/eastasia/press/releases/climate-energy/2016/Chinas-CO2-emissions-continued-to-fall-in-2015--Greenpeace-response/#.VtQL6oVxTL4.twitter>
  13. Pashley A. China Confirms 2015 Emissions Fall as Solar, Wind Break Records News Report; 2016. Accessed 1 March 2016 Available:<http://www.climatechangenews.com/2016/02/29/china-confirms-2015-emissions-fall-but-solar-wind-break-records/>
  14. Al-Buloshi AS, Ramadan E. Climate change awareness and perception amongst the inhabitants of Muscat Governorate, Oman. *Amer. J of Climate Change.* 2015;4:330-336.
  15. Devkota RP. Climate change: Trends and people's perception in Nepal. *J Env. Protection.* 2014;5:255-265.
  16. Dumenu WK, Obeng EA. Climate change and rural communities in Ghana: Social vulnerability, impacts, adaptations and policy implications. *Env. Sci. & Policy.* 2016;55:208–217.
  17. Kasteren YV. How are householders talking about climate change adaptation? *J Env. Psych.* 2014;40:339-350.
  18. Leombruni LV. How you talk about climate change matters: A communication network perspective on epistemic skepticism and belief strength. *Global Env. Change.* 2015; 35:148-161.
  19. Mimikou MA, Baltas EA. Assessment of climate change impacts in Greece: A general overview. *Amer. J Climate Change.* 2013;3:46-56.
  20. Perez C, Jones EM, Kristjanson P, Cramer L, Thornton PK, Forch W, et al. How resilient are farming households and communities to a changing climate in Africa? A gender-based perspective. *Global Env. Change.* 2015;34:95–107.
  21. Limberg L, Sundin O, Talja S. Three theoretical perspectives on information literacy Uni. Borås Human IT. 2012;11(2): 93–130. Accessed 20 March 2016 Available:<http://etjanst.hb.se/bhs/ith/2-11/llosst.pdf>
  22. Miléřa T, Sládeka P. The climate literacy challenge. *Procedia Soc. & Behavioral Sci.* 2011;12:150-156.
  23. Familusi EB, Owoeye PO. An assessment of the use of radio and other means of information dissemination by the residents of Ado- Ekiti, Ekiti-State, Nigeria. *Lib. Phil. & Prac. (e-journal) Uni. of Neb.;* 2014.
  24. Mosiforeba VA, Olaniyi OB. Perception of undergraduates on the adoption of mobile

- technologies for learning in selected universities in Kwara State, Nigeria. Procedia – Soc. & Behavioral Sci. 2015; 176:352–356.
25. Ezemenaka E. The usage and impact of Internet enabled phones on academic concentration among students of tertiary institutions: A study at the University of Ibadan. Nig. Int. J of Education & Dev. using ICT. 2013;9(3):162-173.
26. NCC. Subscriber monthly statistics: November 2014 - January 2015; 2016. Accessed 5 March 2016
- Available:[http://ncc.gov.ng/index.php?option=com\\_content&view=article&id=125&Itemid=73](http://ncc.gov.ng/index.php?option=com_content&view=article&id=125&Itemid=73)
27. Idemudia IG, Nordstrom DB. Nigerian power sector: Opportunities and challenges for investment in 2016. Latham & Watkins Africa Practice. 2016;23:1930.
28. Adepoju P. 93% of internet users in Nigeria Surf the Net Via Mobile; 2015. Accessed 5 March 2016  
Available:<http://www.techcityng.com/93-of-internet-users-in-nigeria-surf-the-net-via-mobile/>

© 2016 Duru and Emetumah; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:  
<http://sciencedomain.org/review-history/15307>*