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PERCEIVED IMPACT OF ENVIRONMENTAL HAZARDS ON INSTRUCTIONAL DELIVERY IN PUBLIC PRIMARY SCHOOLS IN EBONYI STATE NIGERIA

Ogba, F.N
Faculty of Education Alex Ekwueme Federal University, Ndufu Alike
Ebonyi State Email: joefrank8n@yahoo.com
Phone: 08037023694;

Igu, N.C.N
Email: nneigu08@gmail.com

Emeka Nwinyinya
Email: nwinyinyaemeka@gmail.com

Umoke, C
Email: ukhcollins@gmail.com

Abstract
Environmental hazards has gained unprecedented attention all-round the globe because its impact has exacerbated pressure on political, economic, social, health and education conditions of all the countries in the world. Government, organizations both at national and international levels are cut in the web of environmental challenges. This no doubt portends great danger to sustainable development. Educational institutions also face the challenges of how to maintain a healthy school environment amid lack of clear regulatory policies to support the maintenance of environmental health conditions of schools in Nigeria. On this note, the present study therefore investigated the impact of environmental hazards on instructional delivery in public primary school pupils in Ebonyi States of Nigeria. Two research questions and two hypotheses guided the study. The study adopted descriptive survey research design with a sample of 150 (50 males and 100 females) teachers drawn through multi-stage sampling technique from a total population of 11,953 teachers in 1017 public primary schools in Ebonyi State of Nigeria. Two instruments titled Natural Hazards Scale (NHS) and Man-Made Hazards Scale (MMHS) were developed and validated by three experts in the educational field from Alex Ekwueme Federal University Ebonyi State. Internal consistency reliability using Cronbach alpha gave indices of 0.81, and 0.78 for NHS and MMHS. The overall index of the instruments was 0.91. Mean, standard deviation and t-test were used for data analysis. The findings of the study revealed that natural and man-made environmental hazards negatively impact on instructional delivery in public primary schools with aggregates values of 3.03 and 3.00, 2.96 and 2.94. The findings further revealed no significant difference between the male and female teachers on the impact of man-made and natural hazards on instructional delivery with significant values of 0.621 and 0.366 respectively. Based on the findings, it was recommended that male and female teachers should be equally participate in decision making with regards to policy and policy instruments aiming at reducing the negative impact of environmental hazards in school environment, Ministries of Education should create official website to provide useful information to primary school teachers and pupils on harmful activities of environmental hazards and how to avert it, Ministries of Education in collaboration with private organizations/NGOs should organize workshops and seminars for primary school teachers on environmental related issues in the society, among others.

Keywords
Environmental hazards, instructional delivery and education for sustainable development.

Introduction
Education for sustainable development across the world, Nigeria inclusive, is a sine qua non to build a better society for all. Building a better society for all may not be easily achieved especially when the pressing global contemporary issues including environmental hazards are at the pace. In this case, individuals all over the world have been

exposed to a harsh world, with or without protection from environmental hazards. The term hazard connotes any substance that has a high tendency to harm or adversely affect the human population. Primarily, any phenomenon that may result to harm to the well-being of people, animals, damage to property and the environment could be termed as a hazard. This simply implies that hazards could affect all aspect of life including the environment. When it occurs in the environment, it could be termed as environmental hazard.

Environmental hazards could be referred to as the natural and artificial alteration and the daily outcomes of interaction between humans and their surrounding that pose dangerous health effects to humans, plants and animals. In the view of Cutter (2001), environmental hazards are events surfacing from interactions between natural, social and technological systems of the environment that are harmful to humans. Environment that is harmful to humans is worrisome due to the increase death tolls resulting from it. Some years ago, the death tolls resulting from environmental hazards in the world, recorded yearly an average estimate of 106,654 lives and 96.5million people (Lenon, 2013).

Environmental hazards are classified into two groups. The two groups are natural and man-made environmental hazards (Smith, 2001; Ragheb, 2014). Natural environmental hazards manifest from natural conditions and sometimes products of negative consequences of interaction between man and nature. Man-made hazards are usually caused by human related activities in environment. Such activities are physical, chemical, biological and technological. In other words, environmental hazards are further classified into physical, chemical and biological hazards (Lechat, 1984). Physical hazards are one, which causes harm with, or without contact, that includes noise pollution, earthquakes, floods and X-ray. An important chemical hazard of public health significance is tobacco smoke that has been linked to several non-communicable diseases such as lung cancer and chronic obstructive airway disease in humans. Biological hazards are microorganisms, viruses and toxins that cause various infections and allergic reactions in the body (AI-sharqia, 2017). Environmental hazards could manifest in other related ways. According to Santra (2011), environmental hazards emerge from rapid increase in human population, significant increase in human use of resources, technological advancement, the emergence of free-market economies, poor attitude of people towards the environment, among others. In Nigeria, environmental hazards is linked to poor living conditions in the residential environment including the presence of open site dumps, unkempt waste disposal facilities, electric generating plants, open drainages, location and conditions of sanitary facility and indoor cooking, among others (Afon, 2011).

The various ways environmental hazards manifest tend to affect everybody irrespective of the location. In other ways, environmental hazards may not be restricted to any specific location. It could happen anywhere, including in the school environment. The nature of environmental hazards in school setting mostly in primary schools is an issue of global concern due to the high prevalence of it on school children. In support of this, Vazir (2009) stated that more than 1.4 billion primary school pupils from age 5 to 14 years with approximately of 87% live in the society where harmful environmental challenges exist. These harmful environmental challenges affecting primary school pupils tend to affect also the teachers who are under the same roof with them. Similar studies revealed that school children across the world are the most vulnerable to the events of environmental hazards due to climate change with 88% of the burden of diseases (Zhang, Bi, & Hiller, 2007). Based on the high prevalence of environmental hazards across the world, the researchers of this study assumed that primary schools mostly in Ebonyi State, Nigeria are severely exposed to various forms of environmental hazards.

Some of the various forms of environmental hazards could exist around school environment mostly at the primary school level. These forms of environmental hazards include: lead paints and pipes, radon gas, asbestos, exposure to noise, drinking water contamination, soil pollution in playgrounds, poor indoor air quality and electromagnetic fields, among others (Lunenburg, 2010; Chatham-Stephens, Mann, Schwartz & Landrigan, 2012; Paulson & Barnett, 2016). Some other nascent environmental hazards on school environment are heat extremes in previously cooler climates, overcrowding due to displaced populations or shifting geographic range of vector borne diseases and the use of pesticides (Sheffield & Landrigan, 2011; Bushweller, 2000). Furthermore, Intergovernmental Panel on Climate Change (2014) revealed that problems arise when functional school infrastructure is compromised and previously well contained hazardous materials are spread by floods.

Such disasters, made more frequent and more extreme by environmental hazards as well, increase mould growth in classrooms, contaminate school grounds, create physical and chemical hazards from debris and downed electric wires and toxic substances, thereby leading to prolonged school closures with pervasive social and economic challenges for families and entire communities. This simply implies that environmental hazards not only occur in the school environment but equally, tend to adversely affect primary school pupils in Nigeria.

Environmental hazards tend to portend great danger to the sustainable development of human beings. In the first place, long-term exposure to chemical and volatile compounds from art supplies, science lab, and shop facilities could affect mostly the children's health. As public primary schools become more insulated, the toxins from cigarette smoke, chalk dusts, science labs, among others cannot escape and therefore, get circulated through the ventilation system. Another great danger is from the electromagnetic fields which are part of the complicated and growing technology such as computers, microwaves, radio, television, fluorescent lights, among others. Most controversial and visible electromagnet fields are produced by the existence of transmission lines running through various communities and often close to the home, playground and schools. Research revealed that primary school pupils exposed to these power lines suffer from childhood cancer (Adams, 2011). Environmental hazards related activities could cause mould growth in classrooms, school ground contamination with high rate of infections and downed electric wires (Bailey, Krieger, Agenor, Graves, Linos & Bassett, 2017). Environmental hazards could pose a threat to the primary school pupils when pesticides are used in school grounds. The pesticides used in school grounds are mostly harmful to primary school pupils which may affect the central nervous system (Bushweller, 2000). In Nigeria, primary school pupils, among others are also prone to the dangers of environmental hazards due to the rampant of broken walls, floors, windows, toxic substances from electric generating plants around the school premises, presence of open site dumps, open drainages and unkempt waste disposal, among others (Afon, 2011). The point is that the harmful threat of unhealthy environmental activities is everywhere and could pose intractable problems to social life, health and human existence in general, especially if proper attention is not given to it.

In this study, environmental hazards could be seen as phenomena that requires global attention due to its hazardous effect on human population. It therefore could be regarded as alteration arising from the interaction between natural and man-made events that pose great danger to the well being of individuals in every aspect of life, including the domain of teaching-learning process. This simply implies that environmental hazards also exist in school environment and at the same time, tend to portend great danger to education for sustainable development of primary school pupils. Primary school pupils are assumed to be susceptible to various harmful environmental challenges such as air pollution, among others. On this note, indoor air for instance is being polluted because of the application of chemicals, failure of quality ventilation system, air brought in to the building which is contaminated from outdoor sources and usage of microbial contaminants which proliferate in humid and wet environment. Many public primary schools in Ebonyi State of Nigeria are likely to face some environmental hazards arising from the presence of open site dumps, electric generating plants, open drainage, soil degradation, increase in mass population, changes in biodiversity, water pollution, desertification, drought, deforestation, location and condition of sanitary facility, classrooms with broken walls, floors, windows, and proximity to market places, among others. By implication, these harmful environmental activities could pose some problems on public primary school pupils. Although, most problems of environmental hazards may focus primarily on the health of individuals, it therefore, goes beyond affecting economic growth, cost and standard of living, safe travelling, settlements, among others. In other words, other aspect of human endeavour including instructional delivery in public primary schools may be threatened due to harmful environmental challenges around the school environment.

Environmental hazards around the school environment seem to have some negative impact on instructional delivery in primary schools. Studies revealed that the school environment due to environmental hazards is dotted with dilapidated buildings with broken walls, floors, intensive heat, whirlwind, among others (Ofoegbu, 2004; Ofovwe & Ofili,2007; Inuwa & Yusof, 2012). Ofoegbu, Ofovwe, Ofili, Inuwa and Yusof added that the environmental hazards have also affected instructional delivery causing teachers to work under the most uncomfortable and unhealthy conditions. The implication is that when instructions

are ongoing under the dilapidated buildings with broken walls, floors, windows which are as a result of environmental hazards, the pupils may not be able to benefit properly from the result oriented contents. On the other hand, teachers in making efforts to deliver instructions effectively are likely to encounter difficulty in employing innovative teaching and learning strategies using the resources available and evaluation process.

Observably, so many primary school teachers in Ebonyi State are faced with some challenges of environmental hazards. Some primary schools are located near the market and sometimes surrounded by manufacturing companies. Again, toxic substance and noise pollution from the manufacturing industries around the schools may disrupt productive teaching learning activities. The researchers also noticed that environmental hazards arising from an open excavation in quarries in Ebonyi State have also affected instructional delivery in primary schools. Primary school teachers cannot teach well in an environment bedevilled with hazardous substances from the quarry sites mostly located around the primary schools in Ebonyi State. As a result of environmental hazards on instructional delivery, the need to promote proactive learning process in primary schools is necessary.

Establishing a strong knowledge driven society towards promoting meaningful learning process is necessary. Promoting meaningful learning process cannot happen without interactive experiences between the teachers and pupils in the classroom environment. This interaction could be referred to as instruction. Instruction is one of the basic needs of every educational venture and takes a critical position at the implementation stage of the curriculum. However, instruction has been defined and described differently by various scholars in the area of education. Instruction is the actual interaction process between the teacher and the learner (Mbakwem, 2005). This means that classroom instruction is overall activity in the classroom, portraying the teachers' and pupils' instructional behaviour. Therefore, it is from this interaction process that learning takes place (Akudolu, 2006). Kpangbon and Onwuegbu (2004) defined instruction as the process of communicating information to the learner, stimulating relevant learning activities, evaluating the result of these activities and taking remedial action if necessary. Instruction has been described as all activities engaged in by the teacher with the target of facilitating change in learner behaviour using different kinds of delivery approach (Jeremiah & Alamina, 2017). The delivery approach could be regarded as instructional delivery.

Instructional delivery as an essential concept in this study cannot be overlooked. The term instructional as described by Hornby (2015) is an adjective derived from the concept of instruction and it connotes when someone (teacher) teaches people something. Thus, instructional delivery could be referred to as every effort that the teacher makes in order to have fruitful time with the pupils by exposing the contents, employing methods, strategies, the learners' interaction with the environment, resources available as well as evaluation process (Mezieobi, 2009). According to Etuk and Umoh (2003), instructional delivery is all about the knowledge of teaching techniques and their application for learning to take place in such a flexible manner that would not distort the original intent of the teacher for being in the classroom. This also involves specifiable means of controlling and manipulating a sequence of events to produce the required modification of behaviour through learning using varied research-based instructional strategies utilized to engage students in active learning (Anyaogu, 2012; Ebeniza & Ukegbu, 2015; Stronge, 2006). Additionally, instructional delivery is a process in which teachers apply repertoire of instructional strategies to communicate and interact with the learners around academic content, and to support pupils' engagement for better learning outcome (Onwuagboke, Singh & Fook, 2015; Leonard, 2012).

In this study, instructional delivery embraces all human interactive skills used by the teacher to facilitate learning in the classroom situation thereby encouraging improved performance on the side of the pupils. To facilitate learning using instructional delivery in the classroom situation could be a process oriented. The process of instructional delivery could be based on stated learning objectives. It is based on this that when the process of instructional delivery is over, then, opportunity to ascertain if the aim of the lesson has been achieved or not, which is the evaluation act that will tell if the lesson met the stated objectives (Buseri &Dorgu, 2011). The outcome of the lesson or learning objectives may determine the effectiveness of the instructional delivery employed by the teacher. To be effective inclined is an essential way of achieving success in every human activity. Effective is a condition of producing result that is desired

(Hornby, 2004). It may also be a state of producing a successful result in doing thing such as in teaching and learning endeavour. Teaching and learning produce result that is wanted or intended when the learner is able to exhibit behaviour that reflect the objectives and goals of the instructional programme. It is when this happens that one could say that instructional delivery is effective.

Effective instructional delivery is important in education process. Effective instructional deliver enable the teachers to interact well with the pupils and as well, overcome the challenges of meeting the learning needs of various pupils who are assumed to have come from different background with different learning experiences (Voilz, Sims & Nelson, 2010). When every learner is recognised, considered so important and effectively engage in academic activities irrespective of their various learning needs and background through effective instructional delivery, it could therefore, help to increase academic success. Mortiboys (2005) opined that effective teaching and learning are essential factors for success in academia. In another view, Aregbeyen (2010) maintained that effective instructional delivery makes pupils' engagement and discussion, concern and respect for pupils and maximizing pupils' academic achievement. Effective instructional delivery could also help in raising the academic standard of any dying school. Xu, Ozek and Corrotore (2012) supported that encouraging effective instructional delivery to disadvantaged schools could potentially raise pupils performance in those schools.

The importance of effective instructional delivery is applicable to public primary school pupils in Ebonyi State, Nigeria mostly when teachers and pupils interact to establish a positive learning outcome. This positive learning outcome due to effective instructional delivery is more strengthened in a free hazardous environment. Studies revealed that sound and healthy environment tends to stir up expected outcomes of learning and as well, promoting effective instructional delivery (Duruji, Azuh & Oviasogie, 2014; Orlu, 2013). Other studies maintain that teaching and learning process usually happen in physical, social, psychological environment which simply means that a proper and free hazardous environment is pivotal to effective learning (Mudassir & Norsuhaily, 2015). Therefore, a free hazardous environment can directly improve children's health and effective instructional delivery and thereby contribute to the development of health adults as skilled and productive members of society (WHO, 2004). On the other hand, establishing a positive learning outcome may sometime fail to achieve due to harmful environment that could hinder learning interaction between teachers and pupils. When classroom activities are constantly disrupted as a result of environmental hazards, public primary school pupils may not engage well in productive learning endeavour.

This study is guided by the life model theory by German and Gitterman (2008) which states that within the ecological perspective, human beings are conceived evolving and adapting through transaction with all elements of the environment. On this note, human being and the environment reciprocally shape each other. Therefore, individuals mold their environment in many ways and in turn, face with the problems they created. In application of life model theory to this study, individuals who are exposed to environmental hazards which have negatively affected their life must adapt to change of lifestyle which is necessary to curb the menace of harmful environmental activities. This is because most environmental hazards manifest due to natural and artificial alteration arising from the interaction between humans and their environment. Thus, life model theory helps us to understand how life of human beings including those in primary schools act in an environment which may predispose them to environmental hazards. Hence the need to change of attitude is indispensable.

Impact of environmental hazards on effective instructional delivery in primary schools could be gender based. World Health Organisation (2014) defines gender as socially constructed roles, behaviour, activities and attributes judged appropriate by a specific culture for males and females. Gender is referred to as social construct affairs due to economic, socio-cultural and physical factors which individuals recognised and attribute to environmental hazards activities affecting male and female teachers in primary schools. Gender as a phenomenon in teaching learning process could be confronted with some harmful environmental activities capable of affecting instructional delivery in primary schools. Again, inappropriate gender role orientations and socio-cultural activities may expose primary school teachers to become more susceptible and prone to environmental hazards. Environmental hazards have also affected both females and males in various ways.

Studies revealed that environmental hazards

affect in general the human health and that the negative impact is more on females than the male counterparts (Egaga & Aderibigbe, 2015; OSCE,2009). Furthermore, WHO (2009) found that in rural areas, indoor pollution which is an aspect of environmental hazards however affects females more than males, as they are more exposed to smoke from burning fuels. There is more socially constructed and gender-specific vulnerability of females to natural disasters which is integral to everyday socio-economic patterns and leads to relatively higher disasters related mortality rates in females compared with male counterpart (Neumayer & Plumper, 2007). A different study revealed that male teachers are affected with the environmental hazardous activities than the female counterparts in teaching-learning process (Ekpo &Ekpo, 2009). The above findings based on gender is therefore differ from the present study which tends to ascertain the gender differences in environmental hazards on effective instructional delivery in public primary schools in South Eastern Nigeria.

Many of these reviewed studies mainly focused on environmental hazards and were carried out outside the school environment. None of these studies on environmental hazards focused on instructional delivery which the present study considered. Considering the different environment where other studies on environmental hazards were conducted and inconclusive reports on gender differences on environmental hazards, this present study which was conducted in Ebonyi State of Nigeria is however, examined the impact of environmental hazards on instructional delivery in primary schools for sustainable development.

Research Questions

The following research questions are posed to guide the study.

1. What is the impact of natural hazards on instructional delivery of male and female teachers in public primary schools for sustainable development?
2. What is the impact of man-made hazards on instructional delivery of male and female teachers in public primary schools for sustainable development?

Hypotheses

To guide the study, two null hypotheses were formulated and tested at 0.05 levels of significance.

1. There is no significant difference between the mean scores of male and female teachers on the impact of natural hazards on instructional delivery in public primary schools for sustainable development.
2. There is no significant difference between the mean scores of male and female teachers on the impact of man-made hazards on instructional delivery in public primary schools for sustainable development.

Materials and methods

This study adopted a descriptive survey design because data were collected from a sample of the entire population of the study and the result of the findings generalized as the true characteristics of the targeted population (Nwankwo, 2013). The study was carried out in public primary schools in Ebonyi State of Nigeria. The population of the study consists of all the 11,953 teachers from 1,017 public primary schools in Ebonyi Central, North and South (Source: Ebonyi State Universal Basic Education (UBE), 2019/2020 session school census). Sample size of the study was 150 teachers (50 males and 100 females) drawn through sampling technique. In the first stage, stratified random sampling technique was used by the researchers to select 50 primary schools in Ebonyi Central, North and South. The same method was used to select three (3) teachers from the 50 primary schools selected which gave a total sample size of 150 respondents. Two instruments titled Natural Hazards Scale (NHS) and Man-Made Hazards Scale (MMHS) were developed and used for data collection. The instruments with 20 items had two sections of A and B respectively. Section A elicited demographic information of the respondents while section B elicited information on environmental hazards on instructional delivery. The two instruments were designed using four- point Likert response options of Strongly Agreed (SA=4), Agreed (A=3), Disagreed (D=2) and Strongly Disagreed (SD=1). The instruments were validated b y three experts in the educational field from Alex Ekwueme Federal University Ebonyi State. Internal consistency reliability using Cronbach alpha gave indices of 0.81, and 0.78 for NHS and MMHS. The overall index of the instruments was 0.91. Mean and standard deviation were used to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance.

Results

What is the impact of natural hazards on instructional delivery of male and female teachers in public primary schools for sustainable development?

Table 1: Mean and standard deviation scores of the impact of natural hazards on instructional delivery

S/N	Items	Male teachers			Female teachers		
		Mean	Std	Decision	Mean	Std	Decision
1	Flood disrupts effective instructional delivery in primary schools	3.06	.47	Agreed	3.16	.46	Agreed
2	Extreme drought cannot enhance effective instructional delivery in primary schools	3.08	.44	Agreed	3.09	.47	Agreed
3	Heavy rainfall hampers effective communication during instructional delivery	3.26	.48	Agreed	3.23	.49	Agreed
4	Whirlwind brings disorganization in class and as such affect effective instructional delivery	3.14	.46	Agreed	3.11	.47	Agreed
5	Intensive heat makes the classroom uncomfortable for effective instructional delivery	3.10	.36	Agreed	3.13	.39	Agreed
6	The topography of the school can disrupt classroom activities in primary schools	2.36	.63	Disagreed	2.16	.76	Disagreed
7	Regular storm is a serious barrier to effective teaching learning process in primary school	3.19	.67	Agreed	3.15	.66	Agreed
	Aggregate mean and standard deviation	**3.027143**	**0.501429**	**Agreed**	**3.004286**	**0.528571**	**Agreed**

Table 1 reveals that items such as flood, drought, heavy rain, whirlwind, intensive heat and regular storm with serial numbers 1, 2, 3, 4, 5, and 7 have their various mean values above the criterion mean value of 2.50 and were agreed by the respondents as the impact of natural hazard on instructional delivery in public primary schools for sustainable development. Since the aggregate mean values of 3.03 and 3.00 are above the criterion value of 2.50 therefore, natural hazard impacts negatively on

instructional delivery in public primary schools for sustainable development.

Research question 2: What is the impact of man-made hazards on instructional delivery of male and female teachers in public primary schools for sustainable development?

Table 2: Mean and standard deviation scores of the impact of man-made hazards on effective instructional delivery

S/N	Items	Male teachers			Female teachers		
		SA	A	D	SD		
8	Presence of open site dumps around school compound is not safe for effective teaching learning process.	2.98	.77	Agreed	3.15	.74	Agreed
9	Poor indoor air quality is a hindrance to academic activities in primary schools	3.24	.52	Agreed	3.33	.57	Agreed
10	Overcrowding due to displaced populations threatens the atmosphere of engaging pupils in effective teaching learning process	3.04	.53	Agreed	3.10	.54	Agreed
11	Environmental toxic substances arising from physical and chemical debris posed a threat to effective instructional delivery in public primary schools.	2.52	.50	Agreed	2.39	.55	Agreed
12	Rampant broken of school walls, floors and windows are not safe to engage pupils in effective instructional delivery.	2.78	.58	Agreed	2.46	.66	Agreed
13	The use of pesticides in school grounds are harmful to classroom engagement of primary school pupils	2.70	.79	Agreed	2.50	.82	Agreed
14	Open drainage do pose a threat to effective teaching learning activities in primary schools	2.96	.35	Agreed	2.92	.27	Agreed
15	Deforestation expose teaching learning activities of pupils to danger	3.22	.46	Agreed	3.25	.54	Agreed
16	Water pollution is unhealthy environmental hazard affecting classroom engagement of pupils in primary schools	2.84	.47	Agreed	2.89	.45	Agreed
17	Unkempt waste disposal in school environment disrupt classroom activities in primary schools.	3.10	.51	Agreed	3.06	.53	Agreed

Table 1 reveals that items such as open site dumps, poor indoor air quality, overcrowding, toxic substances, broken of school walls, use of pesticides, open drainage, deforestation, water pollution, waste disposal, noise pollution, school nearness to market places and electromagnetic fields with serial numbers 8 to 20 have their various mean values above the criterion mean value of 2.50 and were agreed by the respondents as the impact of man-made hazard on instructional delivery in public primary schools for sustainable development. Since the aggregate mean values of 2.96 and 2.94 are above the criterion value of 2.50 therefore, man-made hazard negatively impacts on instructional delivery in public primary schools for sustainable development.

Hypothesis 1: There is no significant difference between the mean scores of male and female teachers on the impact of natural hazards on instructional delivery in public primary schools for sustainable development.

Table 3: t-test of the mean scores of male and female teachers of the impact of natural hazards on instructional delivery

Gender	N	Mean	Std. Deviation	Df	t-cal	Significant value	Probability value	Decision
Male	50	21.10	1.99	148	.496	.621	.05	Not significant
Female	100	20.92	2.14					

Table 3 shows that the male teachers have mean and standard deviation scores of 21.10 and 1.99 while the mean and standard deviation scores of female teachers are 20.92 and 2.14 respectfully. With a degree of freedom of 148, the calculated t-value of 0.496 is significant because the significant value of 0.621 is less than the probability value of 0.05. Therefore, the hypothesis is accepted. This implied that there is no significant difference between the mean scores of male and female teachers on the impact of natural hazards on instructional delivery in public primary schools for sustainable development.

Hypothesis 2: There is no significant difference between the mean scores of male and female teachers on the impact of man-made hazards on instructional delivery in public primary schools for sustainable development.

Table 4: t-test of the mean scores of male and female teachers of the impact of man-made hazards on instructional delivery

Gender	N	Mean	Std. Deviation	Df	t-cal	Significant value	Probability value	Decision
Male	50	38.52	2.19	148	.906	.366	.05	Not significant
Female	100	38.10	2.88					

Table 4 showed that the male teachers have mean and standard deviation scores of 38.52 and 2.19 while the mean and standard deviation scores of female teachers are 38.10 and 2.88 respectfully. With a degree of freedom of 148, the calculated t-value of 0.906 is significant because the significant value of 0.366 is less than the probability value of 0.05. Therefore, the hypothesis is accepted. This

implied that there is no significant difference between the mean scores of male and female teachers on the impact of man-made hazards on effective instructional delivery in public primary schools for sustainable development.

Discussion of Findings

The finding revealed that natural hazard negatively impacts on instructional delivery in public primary schools. The impact of natural hazards was negative in that natural environmental hazards manifest from natural conditions and sometimes products of negative interaction between man and nature. This therefore disrupted classroom activities of primary school pupils to engage well in productive learning endeavour. However, the finding of this study agrees with the study of Intergovernmental Panel on Climate Change (2014) which revealed that problems arise when functional school infrastructure is compromised and previously well contained hazardous materials are spread by floods. Flood as a natural environmental hazard not only affected the instructional delivery in primary schools but have also resulted to high rate of death globally (Lenon, 2013). Natural hazards negatively impact on instructional delivery because most people failed to embrace free hazardous environment that can directly improve children's health and effective instructional delivery thereby contributing to the health of adults as skilled and productive members of society (WHO, 2004; Duruji, Azuh &Oviasogie, 2014; Orlu,2013).

The findings also showed that there is no significant difference between the mean scores of male and female teachers on the impact of natural hazards on instructional delivery in public primary schools for sustainable development. Based on this finding, it simply implies that both male and female teachers in the primary schools were equally affected due to their exposure to environmental challenges arising from the natural hazards. The finding of this study however, disagreed with the view of OSCE (2009) which said that females were more harshly and often exposed to environmental challenges than the male counterpart. The finding of this study contradicts that of Neumayer and Plumper (2007) who buttressed that there is more socially constructed and gender-specific vulnerability of females to natural disasters which is integral to everyday socio-economic patterns and leads to relatively higher disasters, related mortality rates in female compared with male counterpart.

The finding further revealed that man-made hazard impacts negatively on instructional delivery in public primary schools. This however may be that public primary schools in Ebonyi State of Nigeria is facing with the challenges of unhealthy and hazardous environment. This also exposed them to toxic environment arising from chemicals and other harmful environmental related activities such as lead paints and pipes, radon gas, asbestos, noise pollution, drinking water contamination and soil pollution in playgrounds, poor indoor air quality and electromagnetic fields, among others (Lunenburg, 2010; Chatham-Stephens, Mann, Schwartz & Landrigan, 2012; Paulson & Barnett, 2016). The finding of this study is in tandem with the assertion of Vazir (2009) who said that so many primary pupils live in the society where harmful environmental challenges exist. The harmful environmental challenges also affect the teachers who are in the same environment with the pupils in public primary schools. Similarly, the finding of this study is in line with views of Mudassir and Norsuhaily (2015) who said that a proper and free hazardous environment is indispensable for effective teaching learning process which without it, productive classroom activities become difficult. The finding of this study also agrees with Santra (2011) view that environmental hazards especially man-made hazards have severely affected the well-being of individuals as a result of technological advancement, poor attitude towards the environment, among others.

On the other hand, the hypothesis showed that there is no significant difference between the mean scores of male and female teachers on the impact of man-made hazards on instructional delivery in public primary schools for sustainable development. This implies that male and female primary school teachers are equally exposed to the harmful activities of man-made hazards in school environment. The finding of this study therefore, disagreed with the studies which revealed that environmental hazards affect in general the human health and that the impact is more on females than the male counterparts (Egaga&Aderibigbe,2015). The finding of the present study disagreed with Ekpoh and Ekpo (2009) who said that male teachers exhibited more experience on environmental hazardous activities than the female counterparts in teaching learning process. The finding of this study also contradicts that of WHO (2009) which revealed that in rural areas, indoor pollution which is an aspect of environmental hazards however affects females more than males, as they are more exposed to smoke from burning fuels.

Conclusion

Based on the findings, the study concluded that both natural and man-made environmental hazards had negative impact on effective instructional delivery in public primary schools. It was also concluded that both male and female primary school teachers were equally affected by the harmful activities of natural and man-made environmental hazards in school environment.

Recommendations

The following recommendations are made based on the findings:

1. Females and males should equally participate in decision making with regards to policy and policy instruments aiming at reducing the negative impact of environmental hazards in school environment, among others.
2. Ministries of Education should create official website to provide useful information to primary school teachers and pupils on harmful activities of environmental hazards and how to avert it.
3. Ministries of Education in collaboration with private organizations/NGOs should organize workshops and seminars for primary school teachers on environment related issues in the society.

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