Location as Correlate of Students' Perception of Difficulty of Concepts In Basic Science In Cross River State, Nigeria

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ABSTRACT

This research investigated the location of students as correlate of their perception of difficult concepts in Basic Science in Cross River State, Nigeria. The population of the study comprised all Junior Secondary School III students in Cross River State, Nigeria. Eight hundred and eighty-three students were randomly selected from the population as sample for the study. An expost facto research design was adopted for the study. A questionnaire titled "Students' Location and Perception of Difficulty Basic Science Concepts Inventory (SLPDBSCI)" was the instrument used for eliciting data from the respondents. The data generated from the field were collated and analyzed using the independent t-test analysis technique. The findings, based on the analysis of data, showed no significant difference in the perception of difficulty of Basic Science concepts between urban and rural students. This result was attributed to the fact that the Cross River State government recently renovated all schools in both rural and urban areas and equipped same evenly. Thus, it was concluded that given equal facilities in schools, location notwithstanding, the study of Basic Science would be less difficult for students. It was recommended among others, that government should endeavor to furnish basic schools adequately for the study of science despite diversity in location.

Key words: Location, gender, correlates, perception, concepts, Basic Science.

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1. BACKGROUND TO THE STUDY

The basic level of education remains the key to the success or failure of the whole educational system in Nigeria. Under the Universal Primary Education (UBE) programme, this level is the foundational or bottom-line education upon which all other educational levels are founded (FGN, 2004). This level of education, which begins from primary one and ends in Junior Secondary three, is a period when school children are made to acquire the rudiments of science as well as all other relevant subjects. At this level of education, Science is taught as Basic Science aimed at preparing the individual for useful living within the society and for higher education (FGN, 2014). According to Ibe (2008) during this period, learners are expected to have learning experiences that are comprehensive in terms of being both pre-vocational and academic in nature. At this level, Basic Science is meant to induct students into the world of science (Umezuruike, 2008; Odetoyinbo, 2004).

These kind of learning experiences demand a favorable learning environment, well equipped with necessary facilities.

School location, which can be broadly classified into two, that is, urban and rural, influences the way government shares social amenities like hospitals, electricity, and schools. So, the location of a school could determine the facilities available and possibly, the type of learning environment. Most times, the urban centres are more favoured than the rural areas. According to Ojoawo (1989) school environment is one of the most potent factors that influence the distribution of educational resource. Location, in this study, refers to where a school is situated, which, may either be rural or urban.

Ibe (2008) opines that rural areas are the villages and areas far away from the local government headquarters, and lacking in basic amenities like electricity, pipe borne water, assessable roads and may lack viable libraries and access to institution of higher learning. Ibe further described urban areas as those within the local government headquarters with amenities like electricity, pipe borne water and access roads. It can be deduced from Ibe's description that schools that are situated in the urban areas tend to have all the facilities that give comfort for effective learning, whereas, the reverse may be the case with schools situated in the rural areas. The environment of a school may have a strong influence on a person's perception of a subject as well as other aspects of life.

According to Yiwa and Olarinoye (2004) science environment is made up of the laboratory, adequate materials, proper manpower and peer group. Abdullahi (1992) observes that science environment is an indispensable factor for the understanding of concepts, principles and application of knowledge. Also, Abdulllahi in Effiong (2002) observes that science environment is an indispensable factor for the understanding of concepts, principles and application of knowledge. For Okebukola (2002), good learning environment stimulates positive response in teaching and learning situations but the reverse is the case where such is lacking. The conclusion of these authors is an indication that location of a school, considering all other extraneous variables emanating from where a school is situated, is an important factor to the understanding students have of a subject.

Ekpo (1999) investigated the status of science teaching in Nigerian schools and came out with the finding that there was a general lack of laboratory, studio and workshop facilities and such are more acute in community owned (rural) schools. Also, Gbamanja (1999) affirmed that if learning environment has adequate facilities such as qualified staff, laboratory facilities and functional libraries, learning becomes more effective. The researcher further observes that these facilities are mostly found in urban schools, thus, predisposing the learners to better achievements than learners in the rural schools. It makes sense that students would do better when they learn in positive environments.

With the steady decline in the performance of students in the sciences in public examinations across the country over the years (Agogo, 2003; Samba & Eriba, 2012, Agogo & Onda, 2004), one is positioned to seek for answers to the problem. Owolabi (1990) accentuated that our highly qualified teachers prefer to serve in the urban centres rather than the rural areas. Similarly, Kuliman et al (1977) observed that teachers do not accept postings to rural areas because their conditions are not up to the expected standard, as their social life in the area is virtually restricted as a result of inadequate amenities; facilities are deficient, playground are without equipment, libraries are without books while laboratories are glorified ones. To further strengthen the influence of location on the general performance of students, Obe (1984) found a significant difference in performance of 480 rural-urban primary six pupils on the aptitude subtests of the National Common Entrance Examination into Secondary Schools.

Thus, the researcher concluded that children from urban schools were superior to their rural counterparts. Similarly, Owoeye (2000) holds the view that there was a significant difference between academic performance of students in rural and urban area in public examinations. This seeming difference in academic performance of students between those in urban areas and that of their counterparts in the rural areas may have been one of the reasons for which there is often mass movement of children in quest for better school environment.

Akiri (2008) summarized the challenges faced by the rural learners as provision of qualified teachers refusing appointment in isolated villages; villagers refusing to send their children to school because they are dependent on them for help; parents heisted to entrust their daughters to male teachers: lack of roads , books and teaching materials. Also, Ojoawo (2006) studied the effects of discrimination in the distribution of resources on school performance in an examination. The researcher found that location of schools in Oyo State had significant effect on schools' academic performance and that there was significant difference in performance between the students from rural and urban schools. The difference in academic performance among the students was attributed to the concentration of more qualified mathematics teachers in urban schools as against counterpart schools in the rural areas.

However, in an investigation, Ibukun (1988) observed that teachers in urban secondary schools in Ondo State tended to be better qualified pointing out that there was no deliberate government policy supporting such lopsided resource allocation. The researcher therefore, concluded that, rural schools may have been progressively poorly staffed because of personal refusal of teachers to serve in remote locations. Mbakwe (1986) also affirmed that teachers are differentially distributed to schools. Mbakwe further observed that apart from the tendency of qualified teachers to seek deployment in schools located in urban towns, particularly in the state capitals, more school facilities and services tended to be concentrated in urban schools. Also, the attitude of teachers towards the teaching job especially in the rural areas has been very poor (Ndifon & Cornelius-Ukpepi, 2014).

Owing to the importance of science to the society, one is moved to ask if students' perception of Basic Science concepts is responsible for their poor performance and to examine diversity in location, as an influencing factor on this perception. As observed by Tomlinson and Allan in Conerlius-Ukpepi, Edu and Ndifon (2018), until we face the question of learner diversity, most students inside the classroom door will be ill served. Without large numbers of classrooms where teachers are skilled in meeting varied learners 'where they are' and moving them ahead smartly and with understanding, the number of frustrated and disenfranchised learners in our schools can only multiply.

2. STATEMENT OF THE PROBLEM

Much has been done by the Nigerian government towards enhancing science education. These they have done by ploughing much of public resources into the provision of science equipment and materials in schools, the training of science teachers for science institutions and maintaining an admission policy of 60:40 in Nigerian universities in favour of science. Despite the emphasis on the importance of science education and the huge investments by the government, achievement of students in science has been a source of concern. Thus, parents are seen moving their children from one school to another in quest for better school environment for learning. some people attribute this problem to lack of teachers, lack of interest on science by students, unavailability of facilities, poor funding and so on. However, if science is difficult to students, then there is also need to examine school factors that may have influence on their ability to understand scientific concepts especially, at the basic level of education, which is fundamental. Thus, this study sought to examine location of schools as correlate of the perception of difficulty of concepts among Universal Basic Education students in Cross River State, Nigeria?

3. OBJECTIVES

The main objective of this study was to examine the demographic variable of location as a correlate of students' perception of difficulty of Basic Science concepts at the Basic level of education.

4. METHODOLOGY

4.1 Research Design

One hypothesis was formulated to guide the study. The hypothesis states that Upper Basic Education students' demographic variable of location does not significantly influence their perception of difficulty of concepts in Basic Science. The expost facto research design was adopted for the study. The simple random sampling technique was employed to draw a school sample of 38 from 9 local government areas of the state and a students' sample of 883 Upper Basic Education III (UBE III) students for the study

5. DATA PRESENTATION

A researcher-designed instrument was used to obtain relevant data on the various topics in the Upper Basic Science curriculum, which students perceived as difficult to learn. The independent t-test analysis technique was employed for analyzing data obtained at 0.05 level of significance and with 881 degrees of freedom. The mean and standard deviation of Upper Basic Education students in both urban and rural schools on their perception of these concepts were computed and compared. The summary of the result of the analysis is presented in Table 1.

TABLE 1: Independent t-test analysis of difference in Upper Basic students' perception of difficult Basic Science concepts by location

S/N	Variable	Location	N	Mean	Sd	t
1	Family health (cleanliness)	Urban	524	2.3225	1.16390	-.94
		Rural	359	2.3928	1.03517	
2	Family health (nutrition)	Urban	524	1.8149	.86469	-4.66*
		Rural	359	2.1031	.92933	
3	Disease vector	Urban	524	2.2328	.96159	-.96
		Rural	359	2.2981	1.00988	
4	Disease protection	Urban	524	2.0592	.90797	-1.07
		Rural	359	2.1253	.90523	
5	Immunization	Urban	524	2.1908	.98256	1.23
		Rural	359	2.1086	.96989	
6	Prevention of STIs, HIV/AIDs	Urban	524	2.0992	1.02999	-.89
		Rural	359	2.1588	.93047	
7	Drug abuse	Urban	524	2.1908	1.01698	1.34
		Rural	359	2.1003	.96646	
	Family health total	Urban	524	14.9065	3.89941	-1.41
		Rural	359	15.2786	3.82295	
8	Space travel	Urban	524	3.1508	.85362	.97
		Rural	359	3.0947	.83696	
9	Satellite	Urban	524	3.1508	.81431	.003
		Rural	359	3.0947	.77453	
10	The earth in space	Urban	524	3.1088	.82303	-.88
		Rural	359	3.1922	.80108	
11	Gravitation and weightlessness	Urban	524	9.3893	1.69274	-.05
		Rural	359	9.3955	1.65775	
	Renewable and non-renewable energy	Urban	524	3.2672	.86641	-.004
		Rural	359	3.2674	.74054	
12	Forces	Urban	524	3.3187	.85885	.39
		Rural	359	3.2953	.87597	
13	Crude oil	Urban	524	3.5076	.70639	.20
		Rural	359	3.4986	.64242	
14	Work, energy & power	Urban	524	3.3550	.707775	-.62
		Rural	359	3.3844	.68698	
15	Simple machines	Urban	524	3.3989	.75185	-1.25
		Rural	359	3.4596	.67923	
16	Efficiency of simple machines	Urban	524	3.1908	.87116	-2.24
		Rural	359	3.3203	.82584	
17	Kinetic energy	Urban	524	3.3645	.70423	-.008
		Rural	359	3.3649	.68340	
18	Thermal energy	Urban	524	3.4027	.70241	.89
		Rural	359	3.3593	.71817	

19	Sound energy	Urban	524	3.2653	.82519	-.81
		Rural	359	3.3120	.85394	
20	Electricity energy	Urban	524	3.2576	.82761	-1.29
		Rural	359	3.3287	.78962	
21	Magnetism	Urban	524	3.3569	.78973	.53
		Rural	359	3.3287	.77173	
22	Radioactivity	Urban	524	3.2271	.83652	-.96
		Rural	359	3.2813	.81293	
	Energy total	Urban	524	39.9122	3.56849	-1.16
		Rural	359	40.2006	3.65463	
23	Changes in matter	Urban	524	3.3779	.75634	.59
		Rural	359	3.3482	.71978	
24	Non-living things – elements, compound and mixture	Urban	524	3.1240	.93061	.67
		Rural	359	3.0836	.85791	
25	Resources from non-living things	Urban	524	2.9981	.98264	.27
		Rural	359	2.9805	.93782	
26	Changes in non-living things	Urban	524	9.5000	1.49633	.85
		Rural	359	9.4132	1.50138	
27	Environmental conservation and safety	Urban	524	2.1947	.97005	-2.41*
		Rural	359	2.3565	.98645	
	Changes in living things	Urban	524	1.9103	.87758	1.20
		Rural	359	1.8440	.74979	
28	Air pollution	Urban	524	1.9084	.98711	-.82
		Rural	359	1.9610	.90538	
29	Soil pollution	Urban	524	2.0401	.988765	-1.43
		Rural	359	2.1337	.92992	
30	Environmental hazards	Urban	524	2.5172	1.02254	.40
		Rural	359	2.4903	.96549	
31	Deforestation	Urban	524	2.5420	1.10801	-1.10
		Rural	359	2.6212	1.00624	
32	Desertification	Urban	524	2.5573	1.07045	-.23
		Rural	359	2.5738	1.00528	
33	Depletion of ozone layer	Urban	524	2.6947	1.00586	-1.43
		Rural	359	2.7911	.97358	
34	Environmental conservation	Urban	524	18.3435	4.29597	-1.47
		Rural	359	18.7716	4.24240	
35	Uniqueness of man	Urban	524	2.3817	1.09550	-.43
		Rural	359	2.4123	1.00694	
36	The human body- skeletal system and movement	Urban	524	1.8511	.88582	-2.68*
		Rural	359	2.0139	.88585	
	Changes in living things	Urban	524	1.8588	.96353	-2.78*
		Rural	359	2.0362	.91011	
37	Respiratory system	Urban	524	1.8511	.92799	-2.22*
		Rural	359	1.9889	.89060	
38	Circulatory system	Urban	524	1.8645	.94533	-.45
		Rural	359	1.8914	.80979	

39	Digestive system	Urban	524	1.7805	.91070	-1.69
		Rural	359	1.8830	.87019	
40	Reproductive system	Urban	524	1.846	.97174	
		Rural	359	1.9276	.84912	-1.39
41	Metabolism in human body	Urban	524	2.1832	1.14562	
		Rural	359	2.3621	1.00408	-2.46
42	Sense organs	Urban	524	1.8798	.99466	
		Rural	359	2.0000	.92150	-1.84
43	Reproductive health	Urban	524	2.0840	1.03874	
		Rural	359	2.1337	.85806	-.78
	Resources from living things	Urban	524	2.0477	.99310	
		Rural	359	2.1811	.94726	-2.01*
44	Living things and their activities	Urban	524	21.6202	6.95044	
		Rural	359	22.8301	5.41842	-2.90*
45	Family traits (Genetics)	Urban	524	3.3206	.78725	
		Rural	359	3.1783	.82657	2.56*
46	Information and communication technology (ICT)	Urban	524	2.2195	1.00073	
		Rural	359	2.3677	.92372	-2.26*

*Significant at .05; df = 882; critical t = 1.96

Examination of results showed that there was a significant influence of location on students' perception of nutrition (t = 4.66; p < .05); efficiency of machine (t = 2.24; p < .05); environmental conservation and safety (t = 2.41; p < .05); human skeleton (t = -2.68; p < .05); change in non-living things (t = 2.78; p < .05); respiratory system (t = 2.22; p < .05); resources from living things (t = -2.01; p < .05); living things and their activities (t = 2.90; p < .05); genetics (t = 2.56; p < .05); and information and communication technology (t = -2.26; p < .05) as difficult concepts or topics. The null hypothesis for these cases was rejected because their calculated t-values were higher than the critical t-value of 1.96 given .05 alpha level and with 881 degrees of freedom.

All but one of the t-values were negative meaning that rural Upper Basic Education students had higher mean perception of difficulty of these concepts. This finding means that urban Upper Basic Education students perceive the following concepts: nutrition, efficiency of machines; environmental conservation and safety; human body, skeletal system and movement; changes in living things; respiratory system, resources from living things, living things and their activities, genetics and information and communication technology as more difficult than rural Basic Education students.

For all other Basic Science concepts except the ones mentioned above, there was no significant influence of location on students' perception of difficulty. This is because the calculated t-values were found to be less than the critical t-value of 1.96 given .05 alpha level and with 881 degrees of freedom. The null hypothesis for these cases was retained and the alternate hypothesis rejected. This finding means that Upper Basic Education students in urban and rural areas did not differ significantly, in their perception of family health – cleanliness (t = -94); disease vector (t = -.96) disease protection (t = -1.07); immunization (t = -.96); prevention of STIs, HIV/AIDS (t = -.89); drug abuse (t = 1.34); space travel (t = .97); Satellite (t = .004); earth in space (t = -.88); renewable and non-renewable energy (t = -.004); energy (t = 1.16); force (t = .39); crude oil (t = .20); work, energy and power (t = -.62); simple machines (t = -1.25); kinetic energy (t = -.008);thermal energy (t = .89);

sound energy (t = -.81); electrical energy (t =1.29); magnetism (t = .53); radioactivity (-.96); changes in non-living things (t = -1.16); change in matter (t= .59); non-living things –element, compounds (t =.59); resource from non-living things (t = .27); total – change in non-living things (t - .85); changes in living things (t = 1.28); air pollution (t = -.82); soil pollution (t = 1.44); environmental hazards (t = -7.40); deforestation (t = 1.40); desertification (t = 1.23); depletion of ozone layer (t = -1.43); total 5 (t = 1.47; uniqueness of man (t = 1.43); circulatory system (t = -.45); digestive system (t = - 1.69); reproductive system (t = -1.39); sense organ (t = 1.84); and reproductive health (t = -78) as difficult.

The finding implied that location has no influence on Upper Basic students' perception of forty one (41) concepts. These are family health – cleanliness, disease vector, disease protection, immunization, prevention of STIs, HIV/AIDS, drug abuse, space travel, Satellite, earth in space, renewable and non-renewable energy , energy, force, crude oil, work, energy and power, simple machines, kinetic energy, thermal energy, sound energy, electrical energy, magnetism, radioactivity, changes in non-living things, change in matter, non-living things–element, compounds, resource from non-living things, changes in living things, air pollution, soil pollution, environmental hazards, deforestation, desertification, depletion of ozone layer, uniqueness of man, circulatory system, digestive system, reproductive system, sense organ, and reproductive health Basic Science concepts/topics as difficult.

6. DISCUSSION OF FINDINGS

This section discusses the findings based on the hypothesis of the study

6.1 Location and students' perception of Basic Science concepts

The result on location showed no significant difference in the perception of difficulty of Basic Science concepts between urban and rural students. This result is in agreement with Nja & Neji's (2013) finding that school location was not a factor determining the degree of mastery of selected concepts and students' academic performance in Chemistry. The result was however contrary to the findings of Aganga (1996), (Ojo (1997) and Odekunbi (1997) who affirmed that negative learning environment like inadequate learning materials, lack of library facilities as well as time-table constraints also hinder students' learning in school.

The finding may be an indication that the recent overhauling, renovation and equipping of schools in both rural and urban areas in Cross River State, may have led to a leveling up of the school environment in the rural areas. This tends to remove the impediments that usually cause rural students to differ in their perception of difficulty of various subjects and subsequent poor academic performances, from their urban counterparts.

7. CONCLUDING REMARKS

Effective implementation of education requires basic facilities, the location of a school notwithstanding. Both rural and urban schools can equally impact positively on learning if the environment is made conducive. If the environments of basic schools, in both rural and urban areas, are made conducive for learning, then movement of children from the rural areas to the urban centers would be curtailed. Also, students' understanding of science concepts would be void of disparity notwithstanding the location of the school.

8. CONTRIBUTION TO KNOWLEDGE

In light of the literature reviewed and study evidence, the following recommendations were suggested

1. Teachers should be assisted by government with necessary materials and resources to diagnostically and strategically tackle Basic Science concepts not minding diversity in students' location.
2. Science environment should be made adequate for the study of Basic Science in all locations, whether rural or urban. This is because if science environment is favourable, no matter the location, students will tend to achieve similarly notwithstanding their diversities.
3. Bearing in mind the importance of science in this 21st century, it is necessary that the Cross River State government puts structures and infrastructure in place to enhance effective learning of the subject and thus, disperse as much perceived difficulty of concepts as possible.
4. Teaching to accommodate diversity in students, takes much more than just teachers' possession of cognitive knowledge. Thus, the government should organize workshops, seminars and conferences for serving teachers to acquaint them with conventional methods of teaching that would accommodate all science students without bias based on location.

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