

Knowledge and Attitude of Secondary School Teachers Toward Environmental Pollution in Southwest, Nigeria

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Abstract:

The study examined knowledge and attitude of secondary school teachers toward environmental pollution in Southwest, Nigeria. The research design for this study was descriptive research of the survey type. The population for this study consisted of secondary school teachers in all the public secondary schools in Southwest, Nigeria. The sample consisted of 600 science teachers which were selected using multistage sampling procedure. The Teachers' Environmental Pollution Questionnaire (TEPQ) was used to collect data for the study and it was divided into three sections, namely Section A, B and C. The instrument used for the study was subjected to scrutiny by experts in Science Education and in the area of Tests and Measurement for face and content validity. The reliability of the instrument (TEPQ) was determined by finding the internal consistency through a study carried out outside the sampled locations. Data collected were analysed using Cronbach's alpha which yielded co-efficient value of 0.846 for TEPQ. The data collected through the instrument were analysed using descriptive and inferential statistics as all hypotheses were tested at 0.05 level of significance. The findings of the study revealed that teachers' knowledge of environmental pollution was high. Possession of adequate knowledge of environmental pollution by teachers did not however influence their attitude towards environmental pollution. In addition, teachers' attitude towards environmental pollution was location biased. It was recommended among others that Government and management of secondary schools should enhance

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the attitude of teachers of various categories towards environmental pollution by exposing them to appropriate seminars, workshops and conferences on environmental pollution.

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Introduction

The environment of a man is important to his living conditions and defines how he organizes his actions which are influenced by what surround him. Human being cannot do without his environment. Man's relationship with his environment is a long aged interdependent relationship. Man gives to the environment what he is able to discard in his activities and the environment gives man the cheap and favourable conditions to carry out his activities.

Man cannot do without wastes (which may be from man's immediate, commercial, and industrial activities which have taken several forms and are dumped at various places). Improper dispositions of these trashes to the environment have led to its pollution. Pollution of the environment has come to be a challenge facing man. Improper management of domestic, medical industrial and agricultural wastes are the main reason for environmental degradation leading to pitiable environmental health and diseases. This leads to hazards through physical, micro-biological, or chemical agents of disease. Some in-door wastes that pose environmental challenge in Nigeria are Man and animal faeces, food and market wastes, sewage, industrial and agricultural wastes. Improper disposal of solid wastes and the lack of planned sanitary landfill in Nigeria could pose health threats directly to people living around where the waste is discarded. Human beings need to be secured from contact with waste as much as possible. Specific hazards are found in handling hospitals wastes and animal wastes. The most apparent environmental problem caused by urban solid wastes is poor aesthetic, street littering, and urban degradation.

According to Glick (2001) environmental pollution can be described as the introduction of contaminants such as: pesticides, herbicides, fertilizers into the natural environment in extents that can cause hostile change. Environmental pollution is also the discharge of injurious substances into the environment by man in small measures which gradually accumulate to become hazardous to man and other living organism or in some ways, reduces the quality of human life.

Knowledge implies a collection of facts and data. However, as Grob (2009) argued, environmental knowledge is a precondition of environmental awareness and the emotional involvement is what shapes environmental awareness and attitudes. Pe'er, Goldman and Yavetz (2007) stated that environmental attitudes refer to general behavior toward ecology and the environment, feelings and concern for specific environmental issues, and feelings towards acting to solve environmental challenges. Wood (2013) observed that having these feelings is influenced by personal opinion, which can be developed through personal life experiences and education.

According to Liu and Lin (2014), attitude of secondary school teachers to environmental pollution could be measured by their awareness of environmental challenges especially in the aspect of pollution which may be seen as an underlying belief or value system through which an individual understands the natural environment and the ways in which mans are related to, or dissociate from it and are often considered as potential predictors of environmental behaviours.

Nzeadibe, Egbule, Chukwuone and Agu (2011) carried out a study on teacher's knowledge of environmental pollution and adaptation in the Niger Delta Region of Nigeria.

The major result of the study showed that the level of knowledge was moderate in the Niger Delta region of Nigeria. Padher (2009) conducted a study on 'Environmental Awareness among 'Teacher Trainees'. The findings of his study showed that the subject background of the trainees has its effects on the knowledge and understanding of facts and concepts relating to different aspects of environmental challenges. The teacher trainees having environmental knowledge had significantly higher environmental awareness than others that has no environmental knowledge background. Besides, there was significant difference in the environmental knowledge between the urban and rural teacher trainees in favour of urban teachers (Woodgate, 2012).

According to Kant and Sharma (2013), the trends of environmental abuse in the country might be because of the poor knowledge and negative attitude to environmental pollution and this shows that the human race is heading towards ecological destruction. The concern resounds with the purpose of this research which of necessity will investigate teachers' knowledge and attitude towards environmental pollution in Southwest, Nigeria

In view of the above, the study investigated knowledge and attitude of secondary school teachers toward environmental pollution in Southwest, Nigeria. The study specifically investigated:

- i. the level of secondary school teachers' knowledge of environmental pollution;
- ii. teachers' attitude to environmental pollution;
- iii. the influence of teachers' knowledge of environmental pollution on their attitudes towards environmental pollution;
- iv. the difference in the level of knowledge of environmental pollution possessed by male and female teachers in secondary schools;
- v. the difference in the attitude of male and female teachers to environmental pollution in secondary schools; and
- vi. the influence of location on teachers' attitudes towards environmental pollution

Research Questions

The following research questions were raised for this study:

1. What is the level of secondary school teachers' knowledge of environmental pollution?
2. What is teachers' attitude to environmental pollution?

Research Hypotheses

The following research hypotheses were formulated for this study:

1. There is no significant influence of teachers' knowledge of environmental pollution on their attitudes towards environmental pollution.
2. There is no significant difference in the level of knowledge of environmental pollution possessed by male and female teachers in secondary schools.
3. There is no significant difference in the attitude of male and female teachers to environmental pollution in secondary schools.
4. There is no significant influence of location on teachers' attitudes towards environmental pollution

Methodology

The research design for this study was descriptive research of the survey type. The research was descriptive in that it describes the existing situation regarding the secondary school teachers' knowledge of and attitude to environmental pollution in Southwest, Nigeria. The population for this study consisted of secondary school teachers in all the public secondary schools in Southwest, Nigeria (which consisted of Ekiti, Ondo, Oyo, Ogun, Osun and Lagos States). The number of teachers in public secondary schools in Southwest, Nigeria as at the time of the study was: Ekiti, 5496; Lagos, 16,882; Ogun, 6240; Ondo, 10,809; Osun, 3220; and Oyo, 15,859. (Source: State Ministries of Education, 2020). The sample consisted of 600 science teachers which were selected using multistage sampling procedure.

The Teachers' Environmental Pollution Questionnaire (TEPQ) was used to collect data for the study and it was divided into three sections, namely Section A, B and C. Section A sought for information concerning the bio-data of the teachers such as name of School, Gender, Location, Class taught qualification, year of experience. Section B of the Teachers Environmental Pollution Knowledge Questionnaire consisted of 20 items designed to elicit information on knowledge of environmental pollution. Section C of Teachers' Environmental Pollution Questionnaire consisted of 20 items designed to elicit information on the attitude of teachers towards environmental pollution. The items were rated on a four point, Likert type scale of; Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).

The instrument used for the study was subjected to scrutiny by experts in Science Education and in the area of Tests and Measurement for face and content validity. The reliability of the instrument (TEPQ) was determined by finding the internal consistency through a study carried out outside the sampled locations. Data collected were analysed using Cronbach's alpha which yielded co-efficient value of 0.846 for TEPQ.

The data collected through the instrument were analyzed using descriptive and inferential statistics. The research questions were answered using frequency counts, percentages, means and standard deviation. All the hypotheses were tested using t-test and two-way Analysis of Variance (ANOVA) at 0.05 level of significance.

Results

Research Question 1: What is the level of secondary school teachers' knowledge of environmental pollution?

To determine the level of teachers' knowledge of environmental pollution, their responses were scored and the scores converted to percentages. Teachers who scored below 50% (i.e. 0-49%) were classified as having low level of teachers' knowledge of environmental pollution. Teachers who scored between 50% and 70% (i.e. 50%-69%) were classified as those with moderate level of knowledge of environmental pollution while those who scored 70% and above (i.e. 70%-100%) were classified as those with high level of knowledge of environmental pollution. The level of teachers' knowledge of environmental pollution in the selected secondary schools is presented in Table 1.

Table 1: Level of teachers' knowledge of environmental pollution in secondary schools

Levels of teachers' knowledge of environmental pollution	Frequency	Percentage
Low (0% - 49%)	-	0.0

Moderate (50% - 69%)	121	20.37
High (70% - 100%)	473	79.63
Total	594	100

Table 1 revealed the levels of teachers’ knowledge of environmental pollution in secondary schools in Southwest, Nigeria. The result showed that none of the 594 teachers had low level of knowledge of environmental pollution while 121 teachers representing 20.37 percent had moderate level of knowledge of environmental pollution and the remaining 473 teachers representing 79.63 percent had high level of knowledge of environmental pollution. This showed that the level of teachers’ knowledge of environmental pollution was high. Figure iii further revealed the level of teachers’ knowledge of environmental pollution.

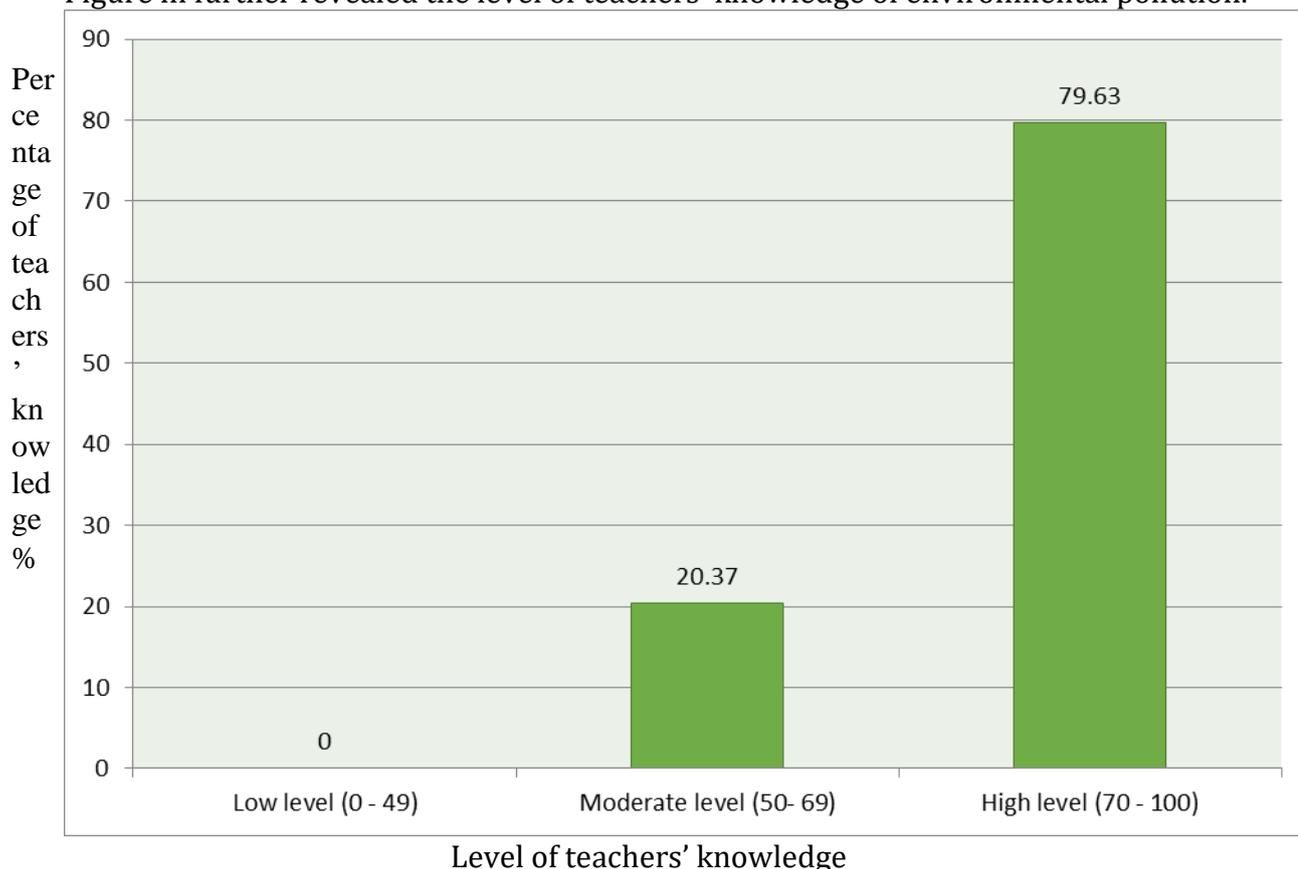


Figure i: Level of teachers’ knowledge of environmental pollution in secondary schools
Research Question 2: What is teachers’ attitude to environmental pollution?

In answering this question, data on attitude of teachers towards environmental pollution were collected from the responses of the respondents to items under section C of TEPQ (item 1 – 20) of the questionnaire. Data collected were analyzed using mean and standard deviation which is presented in table 2.

Table 2: Mean and Standard deviation of teachers’ attitude towards environmental pollution

SN	ITEMS	N	Mean	S.D	Remark
1	Teaching the pollution aspect of biology does not interest me	594	2.35	0.77	Negative

2	Anytime I raise any discussion about pollution my class is always lively	594	2.39	0.80	Negative
3	There is a need to change the way we explore our environment so that we don't cause damage to the environment.	594	2.97	0.26	Positive
4	There is nothing wrong with burning bushes in the dry season	594	1.65	0.66	Negative
5	Pollution can affect our environment and make people ill	594	3.32	0.47	Positive
6	Refuse and garbage should be dumped into nearby streams, rivers and open	594	1.44	0.54	Negative
7	Establishment of industrial development is necessary even if it causes pollution	594	1.90	0.63	Negative
8	The use of waste bins in public places is not necessary	594	1.73	0.45	Negative
9	It is better to apply herbicides in farms than to weed farms	594	1.55	0.66	Negative
10	Defecating in the bush/open places causes pollution	594	3.30	0.46	Positive
11	People don't believe in worldwide global warming	594	2.63	0.56	Positive
12	People are sensitive towards environmental sanitation	594	2.64	0.56	Positive
13	It is better to live in the city than in rural areas	594	3.18	0.39	Positive
14	Environmental problems should not attract special attention	594	1.57	0.50	Negative
15	Littering waste when nobody watches is not an offence	594	1.59	0.49	Negative
16	Students are being encouraged to know how to prevent pollution at school and at home	594	2.67	0.59	Positive
17	Science is the only subject that deals with finding solution to the work of nature	594	3.28	0.45	Positive
18	There is confidence in teaching about pollution to my students	594	3.24	0.43	Positive
19	Responses to pollution crises differ from person to person	594	2.67	0.59	Positive
20	Pollution can be prevented and controlled using the knowledge of science and technology	594	3.24	0.43	Positive

Mean cut-off: 2.50

Table 2 revealed the attitude of teachers to environmental pollution. Based on the mean cut-off mark of 2.50, nine items (items 1, 2, 4, 6, 7, 8, 9, 14 and 15) were rejected because the mean marks of each of the nine items were less than the mean cut-off mark of 2.50. Eleven items (items 3, 5, 10, 11, 12, 13, 16, 17, 18, 19 and 20) were accepted because the mean marks of each of the 11 items was greater than the mean cut-off mark of 2.50. From the above, most of the negative worded items were rejected while positive worded items were

accepted by the respondents. Therefore, it can be concluded that most of the teachers have negative attitude towards environmental pollution.

Test of Hypotheses

Hypothesis 1: There is no significant influence of teachers' knowledge of environmental pollution on their attitudes towards environmental pollution.

Table 3: Two-way Analysis of Variance (ANOVA) of influence of teachers' knowledge on their attitudes towards environmental pollution

Source	Sum of Squares	df	Mean Square	f	Sig.
Corrected Model	3877.462 ^a	11	352.497	85.338	.000
Intercept	1226883.906	1	1226883.906	297025.254	.000
Teachers' Knowledge	3.901	5	.780	.189	.967
Attitude	3078.619	1	3078.619	745.325	.000
Teachers' Knowledge * Attitude	29.548	5	5.910	1.431	.211
Error	2403.992	582	4.131		
Total	1450170.000	594			
Corrected Total	6281.455	593			

a. R Squared = .617 (Adjusted R Squared = .610)

From Table 3, the F value of 1.431 is not significant because the p-value of 0.211 is greater than 0.05 level of significance i.e. $p(0.211) > 0.05$. This led to the non-rejection of the hypothesis. This means that there is no significant influence of teachers' knowledge of environmental pollution on their attitudes towards environmental pollution.

Hypothesis 2: There is no significant difference in the level of knowledge of environmental pollution possessed by male and female teachers in secondary schools.

Table 4: t-test analysis of gender difference in the level of knowledge of environmental pollution possessed by teachers

Variations	N	Mean	Mean Difference	SD	df	t	p
Male	330	36.71	0.02	1.50	592	0.136	0.892
Female	264	36.69		1.47			

$P > 0.05$

Table 4 shows that the t-cal value of 0.136 is not significant because the p value (0.892) > 0.05 . This implies that null hypothesis is not rejected. Hence, there is no significant difference in the level of knowledge of environmental pollution possessed by male and female teachers in secondary schools.

Hypothesis 3: There is no significant difference in the attitude of male and female teachers to environmental pollution in secondary schools.

Table 5: t-test analysis of gender difference in the attitude of teachers to environmental pollution in secondary schools

Variations	N	Mean	Mean Difference	SD	df	t	p
Male	330	49.15	0.35	3.26	592	1.320	0.187
Female	264	49.50		3.24			

P>0.05

Table 5 shows that the t-cal value of 1.320 is not significant because the p value (0.187) > 0.05. Thus the null hypothesis is not rejected. Hence, there is no significant difference in the attitude of male and female teachers to environmental pollution in secondary schools.

Hypothesis 4: There is no significant influence of location on teachers' attitudes towards environmental pollution

Table 6: Two-way Analysis of Variance (ANOVA) for influence of location on teachers' attitudes towards environmental pollution

Source	Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3966.648 ^a	3	1322.216	337.008	.000
Intercept	1447264.498	1	1447264.498	368880.165	.000
Location	13.649	1	13.649	3.479	.063
Attitude	3804.881	1	3804.881	969.792	.000
Location * Attitude	105.186	1	105.186	26.810	.000
Error	2314.806	590	3.923		
Total	1450170.000	594			
Corrected Total	6281.455	593			

a. R Squared = .631 (Adjusted R Squared = .630)

From Table 6, the F-cal value of 26.810 is significant because the p-value of 0.000 is less than 0.05 level of significant i.e. P (0.000) < 0.05. This led to the rejection of the hypothesis. This means that there is significant influence of location on teachers' attitudes towards environmental pollution. In order to find out which of rural or urban location influence teachers' attitudes towards environmental pollution, Multiple Classification Analysis (MCA) was carried out. The result is shown in Table 7.

Table 7: Multiple Classification Analysis (MCA) of influence of location

Grand Mean = 49.21					
Variable + Category	N	Unadjusted Dev'n	Eta ²	Adjusted Independent + Covariate	Beta
Urban	304	2.76	.61	2.71	.21
Rural	290	-2.3		-2.35	
Multiple R					.794
Multiple R ²					.631

The result in Table 7 shows the Multiple Classification Analysis (MCA) of influence of location on teachers' attitudes towards environmental pollution. It reveals that, with a grand mean of 49.21, teachers in urban area had higher adjusted mean score of 51.97 ($49.21+2.76$) than their counterparts in the rural area 46.91 ($49.21+(-2.30)$). This means that teachers in urban area had more positive attitude towards environmental pollution. There was a very high multiple relationship ($R= 0.794$) between the teachers in rural and urban areas. The two locations can also account for 63.1% variability in teachers' attitude towards environmental pollution.

Discussion

The study also indicated the level of secondary school teachers' knowledge of environmental pollution was high. The probable reason for this finding could be because of the expansion in scope of knowledge of teachers. This finding however contradicted the submission of Nzeadibe, Egbule, Chukwuone and Agu (2011) who submitted that the level of knowledge was moderate in the Niger Delta region of Nigeria. Ozor (2009) also concluded that many of the teachers are not aware of what environmental pollution is all about, its major causes, consequences and adaptation strategies. Ishaya and Abaje (2008) also reported that in terms of knowledge, 13% of the teachers have high level of knowledge on environment while 33% of the teachers possess a moderate level of environment knowledge. They concluded that the majority of the respondents the remaining 54% have very low level of environment knowledge. The implication of this finding is that the high knowledge of environmental pollution may positively affect teachers' attitude towards environmental pollution.

The study revealed that there was no significant influence of teachers' knowledge of environmental pollution on their attitudes towards environmental pollution. The probable reason for this finding could be because of the non-application of the knowledge of environmental pollution by teachers. This is in line with the findings of Ozor (2009) that a no relationship existed between knowledge and attitude towards environmental education among teachers. The implication of this finding is that teachers' attitude to environmental pollution might not be affected by their knowledge of environmental pollution.

It was also revealed from the findings of this study that there was no significant difference in the level of knowledge of environmental pollution possessed by male and female teachers in secondary schools. The probable reason might be because of the belief that performance is not influenced by gender. This finding is in consonance with the studies of Çimen & Yılmaz (2014) and Pradhan (2002) who concluded that there is no gender difference in teachers' knowledge of environmental pollution. The implication of this finding is that teachers have same knowledge of environmental pollution irrespective of their gender.

The study further revealed that there was no significant difference in the attitude of male and female teachers to environmental pollution in secondary schools. The finding is in consonance of with the studies of Pillai (2012) who recorded insignificant difference in the attitude towards environmental knowledge pollution by males and females.

The study also revealed that there was significant influence of location on teachers' attitudes towards environmental pollution. This finding contradicts with the study of Chinedu (2008) who found out that location has no significant influence on teachers' attitude towards environmental pollution. Mankilik and Agbo (2011) also reported that both teachers in rural and urban areas had favourable attitude towards the environment. The implication of this finding is that the residential location of the teachers affects their attitude towards environmental pollution.

Summary of Findings

- i. The level of secondary school teachers' knowledge of environmental pollution was high
- ii. The attitudes of secondary school teachers toward environmental pollution differ
- iii. There was no significant influence of teachers' knowledge of environmental pollution on their attitudes towards environmental pollution.
- iv. There was no significant difference in the level of knowledge of environmental pollution possessed by male and female teachers in secondary schools.
- v. There was no significant difference in the attitude of male and female teachers to environmental pollution in secondary schools.
- vi. There was significant influence of location on teachers' attitudes towards environmental pollution.

Conclusion

Sequel to the findings of this study, it was concluded that teachers' knowledge of environmental pollution was high. Possession of adequate knowledge of environmental pollution by teachers did not however influence their attitude towards environmental pollution. In addition, teachers' attitude towards environmental pollution was location biased.

Recommendations

1. Government and management of secondary schools should enhance the attitude of teachers of various categories towards environmental pollution by exposing them to appropriate seminars, workshops and conferences on environmental pollution.
2. Since the attitude of both teachers towards environmental pollution is not gender-biased, effort should be geared towards developing favourable attitude of teachers towards environmental pollution, irrespective of their gender.

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