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EFFECT OF SERVICE LEARNING AND EDUCATIONAL TRIPS INSTRUCTIONAL STRATEGIES ON PRIMARY SCHOOL PUPILS' ENVIRONMENTAL LITERACY IN SOCIAL STUDIES IN OYO STATE, NIGERIA

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Abstract

The study, determined the effect of service learning and educational trips instructional strategies and moderating effect of school location and gender on primary school pupils' environmental literacy in social studies. The pretest, posttest, control group, quasi-experimental design with a 3x2x2 factorial matrix was adopted. A total of two hundred and sixty-four primary 5 pupils were used from 12 primary schools purposively selected from four local government areas in Oyo town, Oyo State, Nigeria and randomly assigned to two experimental and control groups. The experimental groups I and II were treated with service learning and educational trips respectively while control group was exposed to conventional strategy, each group for 12 weeks. Instruments used were Environmental Knowledge Test ($r=0.86$), Environmental Attitude Scale ($r= 0.77$) and Environmental Practices Scale ($r= 0.76$). Seven hypotheses were tested at 0.05 level of significance. Data were analysed using Analysis of Covariance, Scheffé post hoc and graphs. Treatments had significant effects on pupils' environmental knowledge ($F_{(2; 251)} = 29.98; p < 0.05$), attitude ($F_{(2; 251)} = 3.57; p < 0.05$) and practices ($F_{(2; 251)} = 12.93; p < 0.05$). Gender had no significant effect on pupils' environmental knowledge, attitude and practices. School location had significant effect on environmental practices ($F_{(1; 251)} = 75.80; p < 0.05$). The 2-way interaction effect of



treatment and school location was significant on pupils' environmental knowledge ($F_{(2; 251)} = 11.57$; $p < 0.05$). Educational trips had a positive effect on promoting environmental knowledge and attitude of primary school pupils in Oyo Town. Service learning was more effective in enhancing environmental practices than conventional strategy. Therefore, the two strategies are recommended to be used in the teaching of environmental education components of primary school social studies.

Keywords

Community-based, Environmental Education, Gender, School Location

1. Introduction

All over the world, human existence is threatened by environmental problems such as erosion, pollution, deforestation and desertification. Efforts by researchers to find lasting solutions to these problems have not yielded much fruitful result as most of the strategies adopted did not bring about improved environmental literacy (environmental knowledge, attitude and practices). This might partly be because the teaching of environmental education has not utilised out-door and community-based strategies in social studies such as service learning and educational trips.

Warren (2012) explains the term service learning as an instructional strategy in which the learners develop and learn by means of active involvement in a well-structured organized service that is structured to meet the community needs. This is also included in the school curriculum that is academic in nature that learners have to enroll and also give a well-organized time for the learners to reflect on the service experience. Meanwhile, educational trips instructional strategy provides each learner with learning experiences that allows them to go outside the school environment in order experience real life first-hand information through observation (Smith & Sobel, 2010). Service learning and educational trips have the potential to promote environmental literacy but have not been in common use for teaching environmental education in Nigeria.

1.1 Literature Review

Environmental issues arise from the complexity of interaction between the environment and human beings (Warren, 2012). To address issues such as erosion, deforestation, desertification, urban waste and industrial waste disposal; successive governments and non-governmental organizations made concerted efforts to solve environmental problems (Nkire, 2012; Oladapo; 2012; NCF, 2009). Also, there is integration of environmental education into the curriculum of Social Studies, Integrated science, Biology



in Nigeria among others (Gbadamosi, 2011). Specifically, notable scholars have worked on strategies to effectively teach environmental education in Social studies (Nkire, 2012; Oladapo; 2012). The research have made useful contributions to teaching but it becomes worrisome that environmental problems are on the increase (Konina, 2012). Through these contributions, Nigerian youth are rich in knowledge of environmental concepts but, lack the skills to make environmentally sound decisions (Gbadamosi, 2011; Osibanjo, 2008). Researchers such as Ajitoni and Gbadamosi (2012) and Nkire, (2012) reported that this deficiency arises from the way the subject is taught and learnt in schools such as the lecture method, dictation and note taking.

Kudryavtsev, Krasny, and Stedman (2012) reported that educational trips give opportunity for real first hand experiences and brings welcome change to monotonous presence of teachers. Also, available literature reviewed noted that service learning had impact on students' social development, civic responsibility, career interests and skills in solving environmental problems (Warren, 2012; Christine; Durlak & Dymnicki 2011). However, it is noteworthy that most of the studies on service learning were conducted in developed countries such as the United States of America and Great Britain while the one done in Nigeria was theoretical in nature (Olabode, 2010). Hence, there is the need to examine the efficacy or otherwise of service learning as a strategy in enhancing environmental literacy of primary school pupils in Nigeria. Furthermore, the works reviewed the effects of students' gender on learning outcomes contradict one another. There were divergent reports in favour of both sexes. Hence, there is the need for further research on effects of gender on environmental literacy of pupils. Moreover, the effects of location of school on environmental knowledge, attitude and practices are still a major issue of controversy among educators. Inconsistencies in the effects of location of school on learning outcomes prompted further investigation which this study has done.

Moreover, literature reviewed revealed that, primary school pupils are at their formative stage, receptive and strongly motivated and therefore, can be exposed, initiated, and involved for understanding and tackling environmental matter and problems in Nigeria. This study, therefore, determined the effects of service learning and educational trips in social studies on primary school pupils' environmental literacy. The study also investigated the moderating effects of gender and school location on environmental knowledge, attitudes, and practices of the pupils in Social Studies.

2. Methodology

The study adopted a pretest- posttest, control group quasi-experimental design. It involved 264 (139 male and 125 female) primary 5 pupils from 12 public primary schools purposively selected from Atiba, Afijio, Oyo West and Oyo East Local Government Areas of Oyo Metropolis of Oyo State. Intact classes were used. The schools were assigned to treatment groups by simple random sampling technique. The study covered concepts like types of resources: renewable and non- renewable; environmental problems (a) pollution (b) soil erosion and (c) deforestation. The experimental groups I and II were treated with service learning and educational trips respectively while control group was exposed to conventional strategy, each group for 12 weeks. Instruments used were four stimulus instruments and three response instruments, showing in the table 1.

Table 1: *Response Instruments for the Study*

Serial no	Instruments	Reliability coefficient (r)	Method of analysis
1	Environmental Knowledge Test	0.86	Kuder Richardson (kr 20)
2	Environmental Attitude Scale	0.77	Cronbach Alpha
3	Environmental Practices Scale	0.76	Cronbach Alpha

2.1 Procedure

The teachers were trained by the researchers for two weeks. Response instruments were administered to the pupils before the treatment as pre-test, after which all the groups were exposed to the treatment the same time for eight weeks. Thereafter, post-test was carried out to determine effect of the treatments. The schools for the experimental groups were assigned to group1 and group2 by using simple random sampling technique. They are:

Experimental Group 1: Service Learning Instructional Strategy

Phase 1: Preparation

Step I: The facilitator guided pupils to link the concept with environmental issue in the school/ community used.

Step II: The facilitator guided the pupils to mention the areas experiencing environmental issues for the study.

Step III: Pupils discussed the causes of the environmental problems.

Step VI: The facilitator guided pupils to discover the importance of solving the identified environmental problems in the school/community.

Step VII: Pupils decided on what they would do to solve the problem (services to perform).

Phase 2: Action

Step1: The facilitator assisted the pupils to organize the project themselves and develop a work plan.

Step II: The Facilitator guided pupils to develop pre-reflection activities.

Step III: The pupils carried out the service.

Phase 3: Reflection

The Facilitators provided organised time for pupils to reflect, talk and put into writing their experience and observation during the service activity.

Phase 4: Demonstration/ Celebration

The pupils organized presentations on what they have learnt and how the project has positively affected them.

Phase 5: Evaluation

The facilitator examined pupils on the lesson learnt.

Experimental Group 2: Educational Trips Instructional Strategy

Phase 1: Preliminary phase (Before the educational trip)

Facilitator's activities

Step I: The facilitator chose and visited environmental problem site to study.

Step II: The facilitator took attendance of the pupils.

Step III: The facilitator discussed the topic with the pupils.

Step IV: The facilitator presented the purpose of the trip to the pupils.

Step V: The facilitator gave background information by describing specific features to be observed on the trip.

Step VI: The facilitator informed pupils to jot down information received during the trip.

Phase 2: Facilitator's and Pupils' activities (Educational trip)

Step I: The facilitator and the pupils visited the study sites.

Step II: The Pupils observed and studied the causes, effects and solutions to the environmental issues.

Step III: Pupils put down what they had observed.

Step III: The pupils asked questions from the facilitator and or community members.

Phase 3: Follow up/ Evaluation

Facilitator's /Pupils' activities

Step I: The Pupils presented and discussed their observations from the environmental problems sites visited.

Step II: The facilitator evaluated the pupils by asking questions.



Control Group: Modified Conventional Teaching Strategy

Step I: The teacher introduced the lesson by asking questions based on their previous knowledge.

Step II: Presentation of instructional aids and discussion of the content of the lesson by the teacher.

Step III: Teacher instructed the pupils to write the chalkboard summary in their notebooks.

Step IV: Teacher evaluated the pupils by asking some questions

Step V: Teacher gave homework/ assignment.

Data Analysis: Analysis of Covariance (ANCOVA) was used in testing hypotheses, using pre-test as covariates. The Multiple Classification Analysis (MCA) aspect of ANCOVA was used to determine the magnitude of the performance of the various groups. Scheffé Post hoc analysis was carried out to determine the source of significant effect of treatment. Significant interaction effect was described using graphical representation. Seven hypotheses were tested at 0.05 level of significance.

3. Results and Discussion

3.1 Results

H_{01a}: There is no significant main effect of treatment on pupils’ environmental knowledge.

Table 2: Summary of ANCOVA of Post test Environmental knowledge Scores by Treatment, Gender and School location

Source of Variance	Hierarchical Method					
	Sum of Squares	Df	Mean Square	F	Sig.	Eta square
Covariates PRETEST	3.01	1	3.01	.47	.49	
Main Effects (Combined)	384.94	4	96.24	14.99	.00	
TREATMENT	384.79	2	192.40	29.98	.00*	.176
GENDER	9.64E-05	1	9.64E-05	.00	.99	.004
SCHOOL LOCATION	.15	1	.15	.02	.88	.001
2-Way Interactions (Combined)	185.88	5	37.18	5.79	.00	
TREATMENT X GENDER	14.97	2	7.49	1.17	.31	.007
TREATMENT X SCHOOL LOCATION	148.55	2	74.28	11.57	.00*	.068
GENDER X SCHOOL LOCATION	6.59	1	6.59	1.03	.31	.003
3-Way interactions TREATMENT X GENDER X SCHOOL LOCATION	7.01	2	3.50	.55	.58	.003
Model	580.83	12	48.40			
Residual	1610.80	251	6.42	7.54	.00	
Total	2191.63	263	8.33			



There is significant effect of treatment on pupils’ environmental knowledge ($F_{(2,251)} = 29.98$; $p < 0.05$ $\eta^2 = 0.176$). This means that the adjusted post test scores of pupils in the two experimental groups and control are significantly different. Hence, hypothesis 1a is rejected. The partial eta square $\eta^2 = 0.176$. It means 17.6% of the total variance in pupils’ environmental knowledge is due to the treatment, the remaining 82.4% are due to other variables. Hence, there is the need to determine the magnitude of the mean scores of pupils in each group using the Multiple Classification Analysis (MCA).

Table 3: Multiple Classification Analysis of Environmental knowledge Scores According to Treatment, Gender and School location

Grand mean=12.41

Treatment + category	N	Predicted Mean		Deviation		Eta	Beta
		Unadjusted	Adjusted for factors and covariates	Unadjusted	Adjusted for factors and covariates		
TREATMENT							
Service learning	87	12.43	12.42	1.99E-02	1.75E-02	.42	.42
Educational trips	83	13.96	13.97	1.56	1.56		
Control	94	11.01	11.01	-1.39	-1.39		
GENDER Male	139	12.22	12.40	-.19	-1.39E-03	.07	.00
Female	125	12.62	12.41	.21	1.55E-03		
SCHOOL LOCATION							
Urban	163	12.41	12.42	5.74E-03	1.87E-02	.00	.01
Peri-urban	101	12.39	12.38	-9.26E-03	-3.02E-02		
R = .42							
R square = .18							

The study reveals in table 3, that pupils in the educational trip instructional group had the highest adjusted post test environmental knowledge score ($\bar{x} = 13.97$; adj. dev. = 1.56) than their counterparts in service learning ($\bar{x} = 12.42$; adj. dev. = 0.01) and control ($\bar{x} = 11.01$; adj. dev. = -1.39) respectively.

Further it is necessary to link the significant effect obtained for treatment on environmental knowledge. Hence, the Scheffé post hoc tests were carried out.

Table 4: Scheffé Post hoc tests of Environmental Knowledge by Treatment

Treatment	N	\bar{x}	Treatment		
			1. Service Learning Strategy	2. Educational Trips Strategy	3. Control
1. Service Learning	87	12.42		*	*
2. Educational Trips	83	13.97	*		*
3. Control	94	11.01	*	*	

* Pairs of groups significantly different at $P < 0.05$



Table 4 shows that there are significant differences ($p < 0.05$) between pairs of groups service learning ($\bar{x} = 12.42$) and educational trips ($\bar{x} = 13.97$) and control ($\bar{x} = 11.01$) as well as educational trips ($\bar{x} = 13.97$) and control ($\bar{x} = 11.01$). These sums up to the fact that, each of the three possible pairs of groups is significantly different from one another and the three pairs contributed to the observed significant effect of treatment on pupils' environmental knowledge.

H_{01b}: There is no significant main effect of treatment on pupils' Environmental attitude.

To test hypothesis 1b, Table 4 is presented.

Table 5: Summary of ANCOVA of Post test Environmental Attitude Scores by Treatment, Gender and School location

Source of Variance	Hierarchical Method					
	Sum of Squares	Df	Mean Square	F	Sig.	Eta square
Covariates	4.52	1	4.52	1.25	.26	
Main Effects	25.80	4	6.45	1.79	.13	
	25.78	2	12.89	3.57	.03*	.027
	1.07E-05	1	1.07E-05	.00	.99	.001
2-Way Interactions	1.46E-02	1	1.46E-02	.00	.95	.001
	2.62	5	.53	.15	.98	.002
	2.25	2	1.12	.31	.73	.001
	.54	2	.27	.07	.93	.006
3-Way interactions	5.89E-03	1	5.89E-03	.00	.97	.001
Model	1.10	2	.55	.15	.86	
Residual	34.04	12	2.84	.79	.67	
Total	906.86	251	3.61			
	940.91	263	3.58			

* Significant at $P < 0.05$

Table 5 reveals that treatment has significant effect on pupils' environmental attitude ($F_{(2,251)} = 3.57$; $p < 0.05$; $\eta^2 = 0.027$). To this end, the difference in adjusted post test score of pupils exposed to service learning, educational trips and those in control is significant. Hence, hypothesis 1b is therefore rejected. The partial eta square $\eta^2 = 0.027$. This implies that 2.7% of the total variance in pupils' environmental attitude is due to the treatment, the remaining 97.6% are due to other variables. To find out the contribution of the groups mean scores, table 6, is presented.



Table 6: Multiple Classification Analysis of Environmental Attitude Scores According to Treatment, Gender and School location

Grand mean= 17.02

Treatment category +	N	Predicted Mean		Deviation		Eta	Beta
		Unadjusted	Adjusted for factors and covariates	Unadjusted	Adjusted for factors and covariates		
TREATMENT							
Service learning	87	16.94	16.91	-7.64E-02	- .11	.16	.16
Educational trips	83	17.45	17.47	.43	.45		
Control	94	16.71	16.73	.31	.29		
GENDER							
Male	139	16.98	17.01	-4.05E-02	-4.24E-05	.02	.00
Female	125	17.06	17.02	4.51E-02	4.71E-05		
SCHOOL LOCATION							
Urban	163	17.01	17.02	-5.34E-04	-5.34E-04	.00	.00
Peri-Urban	101	17.02	17.01	8.63E-04	-9.48E-03		
R =	.18						
R square =	.03						

From Table 6, pupils in the educational trips instructional group had highest adjusted post test mean score (\bar{x} =17.47; adj. dev=.45) than counterparts in the service learning instructional group (\bar{x} =16.91; adj. dev= -.11) as well as those in the control group (\bar{x} =16.73; adj. dev= -.29). This implies that the educational trips instructional strategy was most potent at improving pupils' attitude than the service learning and the control in that order. Further, the scheffé Post Hoc tests were carried out to link the actual bases of significance in respect of treatment and environmental attitude.

Table 7: Scheffé Post hoc Tests of Environmental Attitude by Treatment

Treatment	N	\bar{x}	Treatment		
			1. Service Learning Strategy	2. Educational Trips Strategy	3. Control
1. Service Learning	87	16.91			
2. Educational Trips	83	17.47			*
3. Control	94	16.73		*	

*Pairs of groups significantly different at P<0.05

Table 7 shows that out of the three possible pairs, only the pair of educational trip (\bar{x} =17.47) and control (\bar{x} = 16.73) had significant difference in pupils' attitude. This is the only pair which was responsible for the observed significant effect of treatment on environmental attitude.

H01c: There is no significant main effect of treatment on pupils’ environmental practices.

Table 8: Summary of ANCOVA of Post test Environmental Practices by Treatment, Gender and School location

Source of Variance		Hierarchical Method					
		Sum of Squares	Df	Mean Square	F	Sig.	Eta square
Covariates Main Effects	PREPRACT	246.32	1	246.32	25.70	.00	
	(Combined)	975.41	4	243.85	25.44	.00	
	TREATMENT	247.97	2	123.98	12.93	.00*	.070
	GENDER	.79	1	.79	.08	.78	.002
	SCHOOL LOCATION	726.66	1	726.66	75.80	.00*	.206
2-Way Interactions	(Combined)	145.83	5	29.17	3.04	.01	
	TREATMENT X GENDER	40.40	2	20.20	2.11	.12	.011
	TREATMENT X SCHOOL LOCATION	82.45	2	41.22	4.30	.02*	.023
	GENDER X SCHOOL LOCATION	4.62	1	4.62	.48	.49	.001
	3-Way interactions	TREATMENT X GENDER X SCHOOL LOCATION	10.19	2	5.09	.53	.59
Model		1377.75	12	114.81	11.98	.00	
Residual: within		2406.19	251	9.59			
Total		3783.94	263	14.39			

Table 8 indicates that, the main effect of treatment on pupils’ environmental practices is significant ($F_{(2,251)} = 12.93$; $p < 0.05$; $\eta^2 = 0.070$). This means that there is significant effect of treatment on pupils’ environmental practices and the null hypothesis 1c is rejected. The partial eta square $\eta^2 = 0.070$. This denotes that 7% of the total variance in pupils’ environmental practices is due to the treatment, the remaining 93% are due to other variables.

Table 9: Multiple Classification Analysis of Environmental Practices Scores According to Treatment, Gender and School location

Grand mean= 27.02

Treatment category	N	Predicted Mean		Deviation		Eta	Beta
		Unadjusted	Adjusted for factors and covariates	Unadjusted	Adjusted for factors and covariates		
TREATMENT							
Service learning	87	28.53	28.48	1.52	1.46	.32	.32
Educational trips	83	27.09	27.24	7.68E-02	.22		
Control	94	25.61	25.52	-1.41	-1.49		
GENDER							
Male	139	26.86	26.99	-.16	-2.91E-02	.04	.01
Female	125	27.19	27.05	.18	3.24E-02		
SCHOOL LOCATION							
Urban	163	28.40	28.41	1.38	1.39	.46	.47
Peri-urban	101	24.78	24.76	-2.23	-2.25		
R	= .57						
R square	= .32						

The Multiple Classification Analysis in table 9, shows that the adjusted post test environmental practices scores of the service learning instructional group was higher ($\bar{x} = 28.48$; adj. dev.=1.46) than that of educational trip ($\bar{x} = 27.24$; adj. dev.=.22) and control ($\bar{x} = 25.52$; adj.dev.= -1.49). This order is summarized as: SL > ET > Control. There is the need to find the magnitude of each group mean score. Table 9 is presented.

Table 10: Scheffé Post hoc Tests of Environmental Practices by Treatment

Treatment	N	\bar{x}	Treatment		
			1. Service Learning Strategy	2. Educational Trips Strategy	3. Control
1. Service Learning	87	28.48		*	*
2. Educational Trips	83	27.24	*		*
3. Control	94	25.52	*	*	

*Pairs of groups significantly different at $P < 0.05$.

Table 10 shows that the three pairs of groups had significant differences from each other. Hence, service learning ($\bar{x} = 28.48$) is slightly different from educational trip ($\bar{x} = 27.24$); service learning ($\bar{x} = 28.48$) is slightly different from control ($\bar{x} = 25.52$) and the educational trip ($\bar{x} = 27.24$) is slightly different from control ($\bar{x} = 25.52$). This means that the three pairs were all responsible for the observed significant effect of treatment on pupils' environmental practices.

H_{02a}: There is no significant main effect of gender on pupils' environmental knowledge.

Table 2 indicates that gender has no significant effect on pupils' environmental knowledge ($F_{(1,251)} = .00$; $p > 0.05$; $\eta^2 = 0.004$). This means that male and female pupils' environmental knowledge do not differ significantly. Hence, hypothesis 2a is not rejected. However, the effect size of gender as indicated by the partial eta square $\eta^2 = 0.004$. This implies that 4% of the total variance in pupils' environmental knowledge is due to the gender, the remaining 86% are due to other variables.

The multiple classification analysis on Table 3 shows that females obtained slightly higher environmental knowledge ($\bar{x} = 12.41$; adj.dev.1.55E-03) than their male counterparts ($\bar{x} = 12.40$; adj. dev. = -1.39E-03). However, this difference is not significant, it might occur due to chance.

H_{02b}: There is no significant main effect of gender on pupils' Environmental attitude.

From Table 5, gender has no significant effect on pupils' environmental attitude ($F_{(1,251)} = .00$; $p > 0.05$). Hypothesis 2b is therefore not rejected.

Table 6 further shows that the female pupils had slightly higher environmental attitude ($\bar{x} = 17.02$; $\text{adj.dev.} = 4.71\text{E-}05$) than the males ($\bar{x} = 17.01$; $\text{adj.dev.} = -4.24\text{E-}05$) though, the difference is not significant.

H_{02c}: There is no significant main effect of gender on pupils' environmental practices.

Table 8 shows that there is no significant effect of gender on pupils' environmental practices ($F_{(1,251)} = .08$; $p > 0.05$). Males and females do not differ significantly in their post test environmental practices scores. Hence, hypothesis 2c is not rejected. Table 9 further reveals that female pupils had slightly higher environmental practices score ($\bar{x} = 27.05$; $\text{adj.dev.} = 3.24\text{E-}02$) than the males ($\bar{x} = 26.99$; $\text{adj.dev.} = -2.91\text{E-}02$). This difference is not significant; it might be due to chance.

H_{03a}: There is no significant main effect of school location on pupils' environmental knowledge.

Table 2 shows that school location has no significant effect on pupils' environmental knowledge ($F_{(1,251)} = .02$; $p > 0.05$). This means that there is no significant difference in the environmental knowledge score of pupils' from urban and those from peri-urban schools. Hypothesis 3a is not rejected. However, the effect size of school location as indicated by the partial eta square $\eta^2 = 0.001$. This implies that 1% of the total variance in pupils' environmental knowledge is due to the school location, the remaining 89% are due to other variables. Table 3 further shows that pupils from urban schools had slightly higher environmental knowledge ($\bar{x} = 12.42$; $\text{adj. dev.} = 1.87\text{E-}02$) than the peri-urban counterparts ($\bar{x} = 12.38$; $\text{adj. dev.} = -3.02$). This difference might be due to chance. It is not significant.

H_{03b}: There is no significant main effect of school location on pupils' environmental attitude.

Table 5 shows that there is no significant effect of school location on pupils' environmental attitude ($F_{(1, 251)} = .00$; $p > 0.05$). Pupils from urban schools and those from Peri-urban schools thus, do not differ significantly in their adjusted post test environmental attitude scores and hypothesis 3b is not rejected. Table 6 shows that pupils from urban schools had slightly higher environmental attitude score ($\bar{x} = 17.02$; $\text{adj. dev.} = -5.34\text{E-}04$) than the Peri-urban Schools pupils ($\bar{x} = 17.01$; $\text{adj. dev.} = -9.48\text{E-}03$).

H_{03C}: There is no significant main effect of school location on pupils' environmental practices.

From Table 8, school location was found to have significant effect on pupils' environmental practices ($F_{(1,251)} = 75.80$; $p < 0.05$; $\eta^2 = 0.560$). Hence, hypothesis 3c is rejected. There is the need to know the magnitude of the contributions of each school location to the observed difference. Table 9 further shows that the magnitude of environmental practices score is in favour of pupils from urban schools ($\bar{x} = 28.41$; adj. dev. = 1.39) compared with pupils from peri-urban schools ($\bar{x} = 24.76$; adj. dev. = -2.25).

H_{04a}: There is no significant interaction effect of treatment and gender on pupils' environmental knowledge.

Table 2 shows that there is no significant interaction effect of treatment and gender on pupils' environmental knowledge ($F_{(2, 251)} = 1.17$; $p > 0.05$). Hypothesis 4a is therefore not rejected.

H_{04b}: There is no significant interaction effect of treatment and gender on pupils' environmental attitude.

From Table 5, treatment and gender has no significant interaction effect on pupils' environmental attitude ($F_{(2, 251)} = .31$; $p > 0.05$). Hypothesis 4b is therefore not rejected.

H_{04c}: There is no significant interaction effect of treatment and gender on pupils' environmental practices.

From Table 8, the 2-way interaction effect of treatment and gender on pupils' environmental practices is not significant ($F_{(2, 251)} = 2.11$; $P > 0.05$). Therefore, hypothesis 4c is not rejected.

H_{05a}: There is no significant interaction effect of treatment and school location on pupils' environmental knowledge. Table 2 shows, a significant 2-way interaction effect of treatment and school location on pupils' environmental knowledge ($F_{(2, 251)} = 11.57$; $p < 0.05$; $\eta^2 = 0.137$). Hence, hypothesis 5a is rejected.

Figure I is presented to explain the nature of the significant interaction.

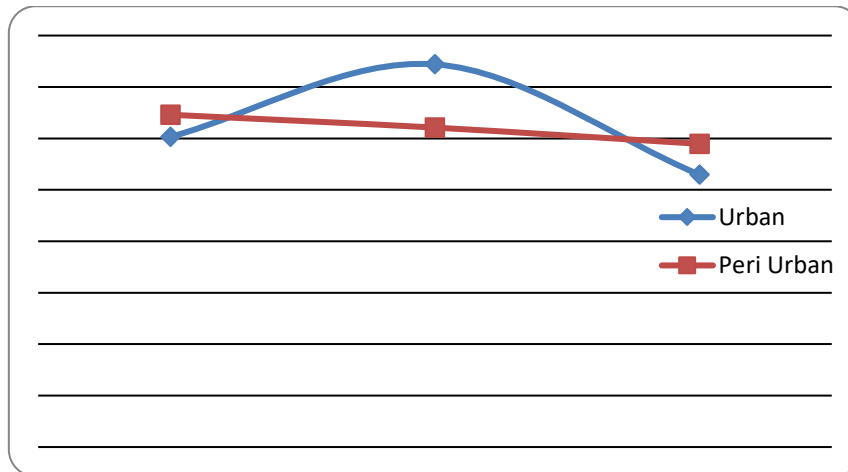


Figure 1: Interaction Effect of Treatment and School Location on Environmental Knowledge

Figure 1 shows that among pupils exposed to service learning instructional strategy, those from Peri-urban schools obtained higher environmental knowledge than their urban counterparts. This trend is the same for the control group where Peri-urban pupils also perform better than their urban peers. However, in the educational trip instructional group, urban pupils performed in environmental knowledge than the peri-urban pupils. This implies that educational trip favours urban pupils in environmental knowledge while service learning favours peri-urban pupils. This is a disordinal interaction.

H_{05b}: There is no significant interaction effect of treatment and school location on pupils' environmental attitude.

Table 5 shows that there is no significant interaction effect of treatment and school location on pupils' environmental attitude ($F_{(2, 251)} = 0.07$; $p > 0.05$; $\eta^2 = 0.114$). Hypothesis 5b is not rejected.

H_{05c}: There is no significant interaction effect of treatment and school location on pupils' environmental practices.

From Table 8, the interaction effect of treatment and school location on pupils' environmental practices is significant ($F_{(2, 251)} = 4.30$; $p < 0.05$). On this basis, hypothesis 5c is rejected.

Figure 2 presents the nature of the interaction.

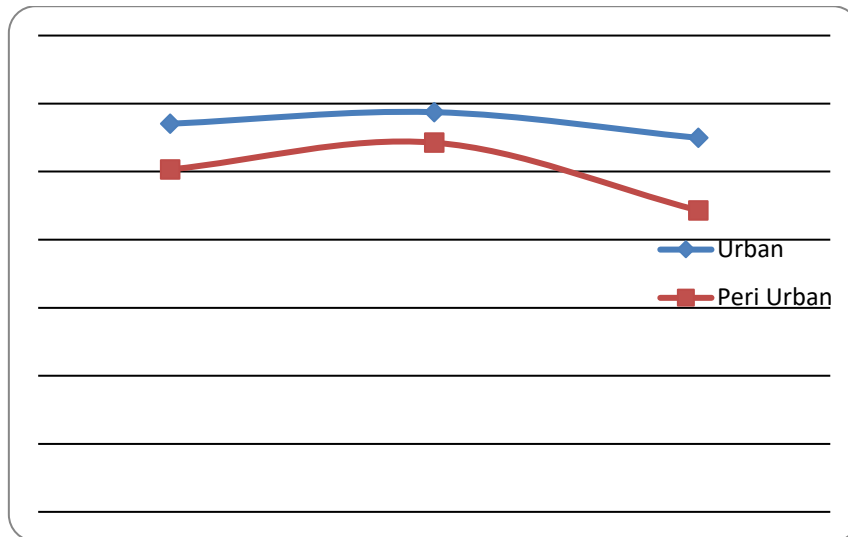


Figure 2: Interaction Effects of Treatment and School Location on Environmental Practices

From Figure 2, it is obtained that among the pupils from urban area, experimental groups (service learning and educational trip) obtained higher environmental practices than control. Also among the pupils from peri-urban area, experimental groups (service learning and educational trip) obtained higher environmental practices than control. Thus, irrespective of whether pupils are from urban or peri-urban, experimental treatments are more effective than the control. This is an ordinal interaction.

From tables 1, 4, and 7, hypothesis 6a, 6b, 6c, 7a, 7b and 7c were not significant. The research indicates that there is no significant interaction effect of (a) gender and school location on pupils' environmental knowledge ($F_{(1, 251)} = 1.03; p > 0.05$); (b) gender and school location on pupils' environmental attitude ($F_{(1, 251)} = .00; p > 0.05$); (c) gender and school location on pupils' environmental practices ($F_{(1, 251)} = .48; p > 0.05$); (d) treatment, gender and school location on pupils' environmental knowledge ($F_{(2, 251)} = .55; p > 0.05$); (e) treatment, gender and school location on pupils' environmental attitude ($F_{(2, 251)} = .15; p > 0.05$); and (f) treatment, gender and school location on pupils' environmental practices ($F = .53; p > 0.05$).

3.2 Discussion/ Implications of findings

The findings of this study have shown that social studies is better taught using service learning and educational trips instructional strategies than the conventional teaching strategy in primary schools (Ajitoni, & Gbadamosi, 2012). The higher performance of pupils exposed to service learning and educational trips has implications for teaching of environmental education concepts which must de-emphasize teacher-centered learning and increase learners' active involvement in the teaching learning process. This is in consonance with



Kathy (2017) and Demirdag,. (2014) that teaching strategies used by the teacher can make success of any education programme. The teaching strategies that make learning interesting, fun and freedom and inculcates attitude and skills of cooperation, sense of responsibility in learners should therefore be favoured.

Educational trip instructional strategy has been known as most effective instructional strategy to enhance pupils' environmental attitude and knowledge. It creates interest in hands-on real world experiences; positive attitude towards the environment; improvement of socialization between students and development of rapport between students and teachers and transforming the lesson periods into interesting and never boring sessions which all add to the improvements of pupils' environmental attitude and knowledge. The implication is that teacher should relate educational trip to the curriculum for improved teaching and learning.

Service learning instructional strategy has been considered as most effective in enhancing pupils' environmental practices (Ajiboye, Ajitoni, & Gbadamosi, 2013). It is necessary for curriculum developers and teachers to adopt teaching strategies and pupils activities that are problem-based approach, which can offer opportunity for pupils to gain a better understanding of what they learn, they retain it longer and they take charge of their own learning. It also offers pupils opportunity to be real-world problem-solvers. The implication of this is that teachers should possess desirable's knowledge, attitudes and skills themselves, before these can be passed to the pupils. It means that teacher training programmes should incorporate ways of equipping teachers with wide arrays of skills to enhance meaningful learning in the classrooms and outside classrooms.

The study has revealed that gender and school location had no significant effect on environmental literacy (Gbadamosi, 2011). This denotes that pupils' performances are resulted from method of teaching used by the teacher while on the other hand Giovanna (2018) reported in a study that male are more likely to perform better than female. However, this study revealed that achievement of learners depends on the strategies put in place by the teacher; therefore, there is the need for total re-orientation of teachers on the use of participatory - community-based strategies in teaching and learning of environmental issues and problems in social studies. They have been considered to be more effective in enhancing pupils' environmental knowledge, attitudes and practices than conventional method.

3.3 Contributions to Knowledge

1. The study addressed an important emerging area of Social Studies Education, environmental education, and provided other effective instructional strategies for teaching and learning of the subject in primary schools.



2. The study provided information on how pupils could become more interested and committed to environmental management. Pupils acquired knowledge, attitudes, motivations and commitments to act either individually or collectively to find solutions to the existing environmental problems in the schools and communities and prevent further environmental problems through planting of trees, regular cleaning of toilet and school compound, use of waste bins, and provision of drainage for easy passage of water and so on.
3. The study fostered relationship between the school and community by connect the school with the communities' needs. Pupils provided solutions to environmental problems in the community by planting trees to control erosion and clearing illegal dump sites to control pollution, among others.

4. Conclusion

It can be concluded from this study that for Environmental Education to be effective and result oriented, there should be a shift in focus from classroom – based instruction to instruction that brings out learners to have physical contact with the realities of environment such as Service Learning and Educational Trips Instructional Strategy. Teachers should be supportive by initiating learning as advocated by Anca (2018). Hence, educational trips instructional and service learning strategies are effective for teaching and learning of environmental issues and problems in social studies in schools in Nigeria.

4.1 Research Limitations

Only gender and school location were considered among other moderating variables that could have affected the outcome of the research. Also, the period of study (12 weeks) was too short to make much generalized claims. The study was limited to some selected environmental concepts in social studies. This makes the result obtained not generalizable beyond the particular concept examined in the study. However, despite all the inadequacies, the findings of the study would serve as a basic foundation for future studies in the field of service learning and educational trips instructional strategies particularly in Nigeria.

4.2 Scope of Future Research

The study should be replicated in lower primary 1-3, private primary schools and all the six geo-political zones of Nigeria, so that a more generalization would be made.

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