NIU Journal of Educational Research Copyright©2024
Nexus International University ISSN: *3007-1844;* 10(1): 15-23

Nigeria Social Studies Teachers' Perceived Competence and Impact of Environmental Education

BIODUN OGUNYEMI, AYODEJI P. IFEGBESAN
Olabisi Onabanjo University, Ago-Iwoye, Ogun State, Nigeria

MOSHOOD B. LAWAL
Lagos State University of Education, Oto/Ijanikin, Lagos, Nigeria.

Abstract. This study investigated teachers' areas of competence and perceived impact of Environmental Education (EE) in Nigeria. A structured questionnaire was administered on four hundred and eleven (411) teachers from thirty selected secondary schools' teachers selected across five local government areas in Ogun State, Nigeria were administered with a structured questionnaire. The results showed that teachers were not competent in the five areas of competency examined and were not well prepared for teaching Environmental Education (EE) during their training. Furthermore, majority of teachers believed that EE would impact positively on the students. Nevertheless, teachers' competence and perceived impact of EE did not significantly differ based on gender or the class taught. However, teachers of senior and junior classes had very different perceptions of the impact of EE. ANOVA test showed that significant difference was found in teachers' area of competence and perceived impact of EE based on their school location, and education qualifications. The results also revealed weak relationship between area of competence and perceived impact of EE.

Keywords: Social studies, Competence, impact, environmental education, Nigeria

1. Background to the Study

One of the key recommendations of the first human environment conference held in in Stockholm, Sweden in 1972, was the call to countries to implement a programme of environmental education (EE) at formal and non-formal education sectors. As a follow-up, several conferences were organized, these include: the Belgrade, 1975 UNESCO Conference on Environmental Education, Tbilisi, Georgia Intergovernmental Conference in 1977, and UNESCO- UNEP Congress in 1987.

The outcome of the 1977 Conference in Georgia, a former USSR State, was the "Tbilisi Declaration". It defined at EE as "a learning process that increases people's knowledge and awareness of the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivation and commitments to make informed decisions and take responsible action" (UNESCO, 1998).

Prior to the definition in the Tiblisi Declaration, the UNESCO-UNEP (1978) explain that EE is to "develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solutions of current problems and the prevention of new ones. Since, the Tiblisi Declaration definition of E E, scholars have come up with different definitions of the discipline to further drive home, the intention and ultimate goal of Environmental Education. Among these scholars are: Erhabor and Don (2016) who describe E E as a process of incorporating environmental content in the curriculum at all levels of education with a view to increase the awareness of the learners on environmental issues. Furthermore, Olatunde-Ayedun (2020) describes E E, particularly in

this 21st century as organised activities geared toward teaching about how natural environments function, how people can better manage their behaviours while relating with their natural environment in a sustainable manner. Drawing from these definitions, EE can be described as a form of education that aims at creating awareness and developing attitudes and inculcating skills in individuals which will help people resolve environmental issues in their communities. EE is therefore, critical for the development of a sustainable environment.

A synthesis of these definitions will reveal a major fact, about the nature of E E. This is that EE is a discipline that focused on both human and nature, it is multi-faceted, and aimed at achieving the following goals:

- Foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- Provide every person with opportunities to acquire the knowledge, values, attitudes commitment and skills needed to protect and improve the environment; and
- Create new patterns of behaviour of individuals, groups and society as a whole towards the environm4ent (UNESCO-UNEP, 1978).

The goals, along with their associated objectives and principles, have influenced much of what has been achieved in the name of EE around the world today. Many countries, particularly developed countries like Nigeria, began EE programme in the 1970s, and these have evolved over the decades.

Countries world over including Nigeria have realized that teachers are important factor/agent in education process. In its National Policy on Education FGN (2013:30) it is explicitly stated that "no education system may rise above the quality of its teachers". This implies that teachers are expected to display high level of competence. Some scholars (Kim et al.,2019; González-Fernández, et al 2024; Ruiz-Cabezas et al, 2020; Vitello et al 2021) view "competence" as a state or quality of being adequately qualified and capable of performing a given task or responsibility. It is a concept that encompasses knowledge, attitude, and skills that a person possesses and use to better and improve performance of his/her tasks. Thus, teacher's competence can be explained as the overall ability of teachers in carrying out their profession, including inculcating students with knowledge and skills through various competencies such as pedagogical, personal, social, and professional competencies. These competencies enable teachers to effectively during the teaching-learning process achieve their behavioural objectives in the classroom (Annan, 2020; González-Fernández, et al 2024; Kim et al.,2019).

In Nigeria, it took a national environmental catastrophe before E E was introduced in the 1990s. Since that time, environmental educators have worked to build EE not as a discipline but rather as a programme that can be included into and taught in schools from primary through secondary levels.

According to Nigerian Education Research Development Council (NERDC, 1992) the goal of EE is to "help students become environmentally aware, knowledgeable, skilled, and dedicated citizens who are committed to work individually and collectively, to defend, improve, and sustain the quality of the environment on behalf of present and future generations of all living things" . With the intervention of NERDC, EE became popular in Nigeria and EE themes were then infused into school subjects at the basic and post-basic education levels (Lawal, 2019). Later development saw the introduction of EE at the tertiary education level, with undergraduate and postgraduate degree programmes introduced into the Nigerian University System.

Nigerian EE is interdisciplinary, and problem-solving approach. It is taught through school subjects: the natural sciences: Chemistry, Biology, Physic, and Integrated Science and Social sciences: Social studies, Geography, Economics subjects. The adoption of this approach to the teaching and integration of EE is based on the understanding that interesting insights and approaches to solving typical environmental issues such as ecological foundation, human environment interaction, impact of environmental change, and sustainable development can be derived from different disciplines (Ogunyemi, 1994; Adara, 1996).

Since the 1970s, research in the field of EE has progressed significantly with most of the studies predominantly focusing on investigating the relationship between knowledge, attitudes, behaviours' and practices (Bonnet, 2013; Skott, 2015). In spite of the critical role of teachers' in educating students', research into teachers' level of competence of EE as well as the influence of teachers' characteristics in the implementation of EE curriculum has been extremely limited in literature. Among the few available are (Dada, Eames, Calder, 2016; Ogar et al. 2020) study of impact of environmental education on preservice teachers' environmental literacy, their preparedness, perception and practices in New Zealand. It adopted a pre-test-post-test design of a mixed-methods approach. The study reported that a

slight shift in the preservice teachers' environmental literacy. Significant relationship between environmental knowledge and dispositions were observed after been exposed to some EE courses. Burns and Bell (2011) study indicated a relatively low level of environmental competence among teachers. Kingsley (2021) study in Cross River State reported that teacher's culture significantly related the teaching of EE; and no significant difference between male and female teachers teaching of EE. Fasiku (2021) study indicated that teachers of Social Studies displayed a more positive attitude to the teaching of EE than non-Social Studies teachers.

Studies on EE in Nigeria have generally focused on determining students' understanding of environmental issues (Agbori, 2016), some focused-on teachers view or perception about infusing EE into school curriculum (Jekayinfa & Yusuf, 2008). Many others try to clarify pre-service teachers and undergraduates' level of awareness and attitudes about environmental issues (Akomolafe, 2011; Egbonyi, & Onnoghen 2016; Omoogun, Onoghen & Ateb, 2014; Ogunyemi & Ifegbesan, 2011; Ogunjinmi, & Oniya, 2016). Others examine the teaching and learning methods for effective EE applications (Ogunbiyi & Ajiboye, 2009). There is no study that has examined teachers' competence and perception of the impact of EE. It is this gap in literature that this study intended to fill. Thus, to empirically conduct this study, the following research questions were raised:

- What areas of Environmental Education do the teachers have competence in?
- What are teachers' perceived impacts of Environmental Education?
- Will there be any significant difference in teachers' competence and perception of impacts of EE based on their background characteristics?
- Is there any significant relationship between teachers' background variables and their competence and perception of impact of EE?

2. Research Methodology

The study's sample were selected from secondary school teachers in Ogun East Senatorial District of Ogun State. Out of the 84 schools in the five local government areas (Ijebu-Ode, Odogbolu, Remo-North, Ikenne, Sagamu and Ijebu-North) that were selected, thirty secondary schools were randomly selected from each of the local government area. A total of 450 teachers with fifteen teachers selected from each secondary school were administered with the questionnaire. However, 411 teachers (i.e. 91.3% return rate) correctly completed the questionnaires and these were used for the analysis.

A close-ended questionnaire was employed as the data collection tool for this quantitative investigation. The questionnaire created for this study was divided into three sections: section A included nine questions about background information, section B had five questions about EE competency, and section C had twelve questions about how people felt about EE, that is its impact. Responses were measured on a 5-point scale that ranged from "strongly agree" to "strongly disagree". The Cronbach alpha for this instrument was 0.76 after pre-test of test-retest was conducted.

The Statistical Package for Social Sciences (SPSS) version 23 was used to analyse the data collected. Simple percentage, Mean and Standard Deviation were employed to respond to the first two research questions. The t-test, ANOVA, and Pearson Product Moment Correlation were used to address the third and fourth research questions.

A four-point Likert "very competence", "adequate competence', "Not competent" and "don't know" and a five-point scale of "Strongly agree", "Agree", "Undecided", "Disagree", and "Strongly disagree". Nominal values were assigned to each of the scale. In order to classify the teachers' perceived impact of EE from the responses the following cut-off ranges were established: positive disposition = Mean score from 3.00 to 5.00; neutral disposition = Mean scores from 2.00 to 2.99 and negative attitude = Mean scores from 1.00 to 1.99. A standard greater than 1.00 was taken to be indicative of high variability among responses.

3. Results and Discussions

According to respondents' demographics, there were 56.4% female and 43.6% male. The respondents' ages ranged from 18 to 37 years old, with a mean of 30 years. As for the education level, 10.5% of the respondents had Nigeria Certificate of Education (NCE), 9.0% were Polytechnic graduates with OND; 25.3% were first degree holders without education and 36.5% were degree holders with education bias. Forty-seven percent of the teachers teach the senior secondary classes while 53 percent teach the junior secondary classes.

When asked if they had received any pre-service or in-service training to teach Environmental Education, 31.1% of the respondents said Yes, 50.0% said No while 18.2% not sure. Of the 31.1 percent respondents who responded in the affirmative, only 20.9% rated their preparation as very adequate, 14.4% perceived it

as adequate and 64.7% rated it as not adequate (Table 1).

Table 1: Teachers' preparation of EE

	Yes	No	Not Sure
Do you have any prior knowledge or experience teaching environmental education?	128 (31.1)	208 (50.0)	75 (18.2)
	Very Adequate	Adequately	Not adequate
If Yes, how well did the course prepare you for teaching environmental education	86 (20.9)	88 (14.4)	260 (64.7)
	Yes	No	Not sure
Do you teach environmental concepts/issues in your lesson?	92 (22.4)	251 (61.1)	68 (16.5)

This result shows that during their training, teachers are not well prepared to teach EE. Perhaps, this accounted for the nature of the response given to the question on whether teachers teach environmental concepts/issues in their lesson. Almost two-third (251; 61.1%) of the teachers responded in the negative "No", while only (92; 22.4%) answer "Yes", and (68; 16.5%) "Not sure". Another factor that could be responsible is the level of curriculum content enrichment used for the teachers while being prepared to become trained teachers, which incidentally is low in EE content.

Table 2 presents the results of the teachers' areas of EE. Results indicated that teachers are generally not competent in the five aspects of competence measured. As Table 2 shows, only 12.2 % of the teachers claimed to be very competent, 17% adequate competent in environmental knowledge and concepts, while 43.3% said they are not competent and 27% cannot say if they are competent or not. On environmental attitudes and values, 14.6 % and 16.1% respectively has very competence and adequate competence in developing environmental attitudes/values while over half of the respondents' i.e., 52.1% do not possess the competence.

Table 2: Teachers' Area of Competence

	Very competent	Adequate competent	Not competent	Don't know	Mean	SD
Environmental knowledge/concepts	50 (12.2)	70 (17.0)	178 (43.3)	113 (27.5)	2.14	0.54
Environmental attitudes/values	60 (14.6)	66 (16.1)	214 (52.1)	70 (17.0)	2.27	0.56
Teaching skills of environmental/ investigation	68 (16.5)	51 (12.4)	174 (42.3)	118 (28.7)	2.16	0.54
Influencing student's environmental behaviour	57 (13.9)	43 (10.5)	200 (48.7)	111 (27.0)	2.11	0.53
Responsible environmental behaviour	85 (20.7)	68 (16.5)	183 (44.5)	75 (18.2)	2.39	0.59
Total	320 (15.6)	298 (14.5)	949 (46.2)	487 (23.7)	2.11	0.55

Just 16.5% of the teachers claimed to be "very competent" in teaching skills of environment and investigation, 28.7% said they were "adequately competent". However, 42.3% reported that they were not competent, while 11.7% said "don't know". In terms of influencing students' environmental behaviour, 27.0% and 10.5% respectively were "very competent" and "adequately competent". Almost half 48.7% were not competent. Less than a quarter 20.7% are very competent and 16.5% adequate competent were competent in responsible environmental behaviour. But 44.5% and 17.0% not competent or don't know.

These could not but be expected because, even with the background of some of the teachers regarding their areas of specialization, the content areas of EE and the pedagogies for delivering such demand some skills and capacity building which the teachers were not exposed to during their pre-service training.

Table 3 displays the teachers' perceived of impact of environmental education. The majority of respondents believed that EE will impact positively on the students. The analysis of the survey items found that the overall mean score for all items was 3.76 which suggests that the teachers have a perception of the possible positive impact of EE.

Table 3: Teachers' Perceived impact of Environmental Education

	Perceived impact of EE	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree	Mean	SD
1	Increase interest in environmental issues	55 (13.3)	53 (12.9)	33 (8.0)	202 (49.1)	68 (16.5)	3.40	1.32
2	Improve quality of life	18 (4.4)	63 (15.3)	62 (15.1)	165 (40.1)	103 (25.1)	3.60	1.17
3	Clean and healthy school environment	8 (1.9)	49 (11.9)	68 (16.6)	142 (34.5)	144 (35.0)	3.87	1.10
4	Change in attitudes towards environment	11 (2.7)	52 (12.7)	55 (13.4)	178 (43.3)	115 (28.0)	3.81	1.07
5	Reduction in waste generation	3 (0.7)	45 (11.0)	87 (21.2)	178 (43.3)	98 (23.8)	3.77	.98
6	Improved waste management strategies	11 (2.7)	38 (9.3)	104 (25.3)	175 (42.6)	83 (20.2)	3.67	1.01
7	Increase involvement in environmental activities	13 (3.2)	38 (9.2)	89 (21.7)	175 (42.6)	96 (23.4)	3.73	1.03
8	Greater understanding of the interrelationship between human and environment	11 (2.7)	41 (10.0)	69 (16.8)	142 (34.5)	148 (36.0)	3.90	1.10
9	Behave in an environment responsible manner	14 (3.4)	52 (12.7)	72 (17.2)	150 (36.5)	123 (29.9)	3.75	1.14
10	Develop appreciation of the natural environment	7 (1.7)	39 (9.5)	91 (22.1)	183 (44.5)	91 (22.1)	3.75	.97
11	Knowledge of some basic environmental concepts	12 (3.0)	30 (7.3)	56 (13.6)	188 (45.7)	125 (30.4)	3.92	1.03
12	Wanting to take action to improve the environment	17 (5.6)	38 (9.2)	43 (10.5)	197 (47.9)	116 (28.2)	3.86	1.07
	Total	180 (3.6)	538 (10.9)	829 (16.8)	2075 (42.1)	1310 (26.6)	3.76	0.80

All twelve items exhibited high mean scores above 3.00 with the mid- point suggesting that teachers were positively disposed to the positive impact of EE. More than 68.7% of them agreed or strongly agreed that EE impact on the students while 14.5% of respondents disagreed and strongly disagreed.

An-item-by-item analysis revealed that over two-thirds of the respondents (65.5%) agreed that EE "*increase interest in environmental issues",* whilst an equally large number (65.1%) of the teachers agreed that EE "*improves quality of life".*

Furthermore, about 69.5% of the respondents suggested that *"EE impacts on "clean and healthy school environment"*. Also, more than two-thirds of the respondents (77.2%) were agreed that "reduction in waste generation". The majority (62.8%) said they agreed that *"EE "can improve waste management strategies"*. Seventy percent of the respondents agreed with statements that "*greater understanding of the interrelationship between human and environment",* while (66.4%) agreed with the statement that *"EE would make students to behave in an environment responsible manner"*. Sixty-six percent (66%) of the teachers agreed that *"EE impact would lead to "develop appreciation of the natural environment".* An equally higher percent (76.1%) agreed that "*Environmental Education will impact on the knowledge of some basic environmental concepts"* and *"wanting to take action to improve the environment'.*

Further analyses in respect of independent variables of the study revealed the findings, which are summarized in Tables 4 & 5. An independent t-test analysis revealed that male and female teachers' competence and perceived impact of EE, is not significantly difference between them. (see Table 4).

Table 4: Test of significant difference between teachers' sex and perceived competence/impact of EE

	Sex	N	Mean	Std. D	t	Sig.
Competence	Male	179	13.39	2.97	.592	.554
	Female	232	13.17	4.33		
Perceived Impact of EE	Male	179	45.04	9.73	-.149	.882
	Female	232	45.18	9.48		

The One-way ANOVA test showed that there were significant difference in teachers' competence and perceived impact of EE based on their school location, and educational qualifications.

Table 5: Test of significant difference

School Location		Sum of Squares	df	Mean Square	F	Sig.
Competence	Between Groups	93.235	2	46.618	3.260	.039
	Within Groups	5833.787	408	14.298		
	Total	5927.022	410			
Perceived Impact of EE	Between Groups	396.671	2	198.335	2.172	.115
	Within Groups	37264.487	408	91.335		
	Total	37661.158	410			
Education qualification						
Competence	Between Groups	475.636	5	95.127	7.067	.000
	Within Groups	5451.386	405	13.460		
	Total	5927.022	410			
Perceived Impact of EE	Between Groups	6697.639	5	1339.528	17.521	.000
	Within Groups	30963.519	405	76.453		
	Total	37661.158	410			

Scheffe post-hoc analysis was used to determine the group where the significant difference was found: differences existed between competence mean score for teachers in semi-urban schools (M= 13.68) and was significantly different from teachers from rural schools (M=12.23).

Post-hoc test for educational background revealed that in competence, significant differences were found among teachers with NCE (M = 13.97) and B.A/B.Sc. (M = 11.55); B.A/BSc. (11.55) and B. A/B.Sc. Ed. (M =13.96); OND (M=12.64) and M.Ed. (M =14.12). While there were significant differences in perceived impact both between and within the group.

The correlations are indicated in Table 6. As Table 6 indicates, competence is clearly related to perceived impact of EE ($r = .273$, $p < 0.01$) although positive and weak. The correlation between some respondents' socio-demographic variables and the two dependent variables of competence and perception of impact of EE were weak and negative. For instance, this was found in subject taught (r = -.209), teaching experience (r = -.193) and subject of specialisation (r = -.141).

Table 6: Correlation between teachers' background characteristics, competence and perceived impact of EE

	1	2	3	4	5	6
1. School Type	1					
2. Sex	.309**	1				
3. School location	.101*	.062	1			
4. Teaching experience	-.015	.040	.112*	1		
5. Competence	.015	-.029	.072	-.127**	1	
6. Perceived impact of EE	.058	.007	.098*	-.193**	.273**	1

**Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

This study sought to ascertain the areas of competence and perceived impact of EE on learning. Teachers are essential to a successful educational system and critical to the implementation of educational programmes in general. Any curriculum's success or failure mostly hinges on how competent the teachers are. The findings suggest that majority of the secondary school teachers are not exposed to and inadequately prepared to teach EE. They lack competence in the five areas of EE competence identified in the study. This finding corroborates previous research (Ajayi, 2015; Banerjee, et al 2014; Kuo-Shu et al., 2017), that have shown that teachers are not adequately prepared to teach EE. They are not just deficient in EE content but also in its pedagogy or method of teaching. Low (2014) also reported that a

teacher is only as competent as his/her job allows him/her to be.
This could be further confirmed by the findings of a study conducted by Banerjee, et al (2015), which revealed that that students do differ significantly in achievement in Life Science subjects due to teaching by high or low competent teachers and due to high or low effectiveness of teachers. They equally established a positive relationship between the teacher's competence and teaching effectiveness.

Findings also suggest that the majority of respondents believed that EE would impact positively on the students. The analysis of the survey items found that the overall mean score for all items was 3.76 indicating that teachers possess positive impact of EE. This result found support in Kuo-Shu et al (2017) study which reported that EE had a significant perceived impact on student learning and teaching process. It also showed that EE had the most impact on students' enthusiasm, motivation, and attitudes towards learning. Findings from Yesilyurt et al. (2020) study also lend a great credence to this result. According to the findings of the research, students who received Environmental Education, draw pictures enthusiastically and reflecting environmental awareness, also after interviews students gain awareness towards the environment, and empathised with nature.

There was, however, no significant difference existed between teachers' competence and impacts of EE by gender as well as class taught. There are statistically significant differences at $p<.05$ in the means of the teacher's areas of competencies and perceived impacts of EE according to their subject taught, subject of specialisation and educational background. Although, all the teachers, regardless of their demographic background, have attended the same teacher education preparation programme approved by the Federal Ministry of Education, teachers still showed difference in competencies and perceived impacts of EE.

Findings revealed that teachers' competence of EE is related to their perceived impact of EE. This is in line with the study of Chikati, and Okendo, (2018) reported a positive correlation between environmental literacy variable and responsible environmental behaviour. Some of the teachers' demographic variables showed either positive or negative correlation with their competence and/or perceived impact of EE.

4. Conclusion and Recommendations

This study was conducted to assess teachers' competence in EE. The results of the study indicated that the great majority of secondary school teachers lacked competence in all five EE domains. The majority of secondary school teachers had positive opinions on the impact of EE. Additionally, there were no significant gender differences in competence and perceived impacts of EE. However, there were significant differences in competence and perceived impact of EE according to the subject taught, the area of specialisation, and the educational qualification.

The findings led to certain recommendations that will not only strengthen the instructors' current competencies but also improve the school EE programme in Ogun State and Nigeria. In 21ecognizing the importance of teacher professional development, there is a need for review of the current teacher education programme with a view to making EE become an integral part of the teacher education programme in the various teacher training institutions. The government should provide opportunities for periodic in-service training on EE to teachers. Support structures to facilitate the implementation of EE must be put in place. Also, there is need to develop a structured syllabus or learning concepts on EE which will be made available to all teachers in order to help them get familiar with what to teach and incorporate them into their lesson.

References

Agbori, C. N. (2016). The Importance of Incorporating Environmental Education (EE) into Teacher Education Programmes in Nigeria *International Journal of Scientific Research in Education*, 9(4), 248-263.

Adara, O. A. (1996). Strategies in environmental education in Nigeria by the year 2000. *Environmental Education Research*, 2(2), 237-246.

Ajayi, C. O. (2015). Teacher's competence needs in the multidisciplinary Approach of Implementing of Environmental Education *British Journal of Education, Society & Behavioural Science, 8(3), 189-196*

Ajiboye, J. O., & Ajitoni, S. O. (2008). Effects of full and quasi-participatory learning strategies on Nigerian senior secondary students' environmental knowledge: Implications for classroom practice. *International Journal of Environmental Science and Education, 3,* 58–66.

Akomolafe, C.O. (2011). Impact of Personal Factors on Environmental Education in Tertiary Institutions in Ekiti State, Nigeria. *International Journal for Cross-Disciplinary Subjects in Education* (IJCDSE), Special Issue 1(1),

Alvarez-García, O., Sureda-Negre, J. & Comas-Forgas, R. (2018), Assessing environmental competencies of primary education pre-service teachers in Spain, *International Journal of Sustainability in Higher Education*, 19(1), 15- 31. https://doi.org/10.1108/IJSHE-12-2016-0227

Annan, J. K. (2020). Preparing Globally Competent Teachers: A Paradigm Shift for Teacher Education in Ghana. *Education Research International*, Article ID 8841653, 9 pages https://doi.org/10.1155/2020/8841653

Banerjee, S. Das, N., & Mohanty, A. (2014). Impact of teacher competence and teaching effectiveness on students' achievement in Life Science subjects at the upper primary stage. *Indian Journal of Education* XXXIX (4) February 29-48

Bonnet, M. (2013). Sustainable development, environmental education, and the significance of being in place. *The Curriculum Journal*. 24(2), 250–271.

Chikati, T.M., & Okendo, E. O. (2018) Teachers' and Students' Perceptions of Integrated Environmental Education in the Secondary School Curriculum for Managing Environmental Degradation in Machakos Sub County, Kenya. *The International Journal of Social Sciences and Humanities Invention* 5(7), 4881-4889

Egbonyi, E. E., & Onnoghen, U. N. (2016). From environmental awareness to environmental responsibility: towards a stewardship curriculum. *Journal of Educational Issues*, 2(2), 60-72. http://dx.doi.org/10.5296/jei.v2i2.9265

Erhabor, N. I. & Don, J. U. (2016). Impact of Environmental Education on the knowledge and attitude of students towards the environment. *International Journal of Environmental and Science Education* 11(12) 5367-5375.

Fasiku, A.M. (2021) Social Studies Specialists' Teachers' Knowledge Acquisition on Environmental Education in Junior Secondary Schools in Ekiti State, Nigeria. *European Journal of Science, Innovation and Technology* 1(6), 107-113

González-Fernández, R., Ruiz-Cabezas, A., Domínguez, M.C.M., Subía-Álava, A.B., Salazar, J.L.D. (2024). Teachers' teaching and professional competences assessment, *Evaluation and Program Planning*, 103,

Jekayinfa, A. A. & Yusuf, A. (2008) Teachers' opinions on the incorporation of environmental education in the Nigerian primary school curriculum. *Educational Research and Review* 3 (11), 334-338, Available online at http://www.academicjournals.org/ERR

Kanene, K. M. (2016). The impact of environmental education on the environmental perceptions/attitudes of students in selected secondary schools of Botswana. *European Journal of Alternative Education Studies* 1(2),36-54

Kim, S., Raza, M., & Seidman, E. (2019). Improving 21st-century teaching skills: The key to effective 21st century learners. *Research in Comparative & International Education*. 14(1) 99–117

Kingsley, C. E. (2021). Perceived teacher's culture and teaching of environmental education at the Universal basic Education level in Cross River State, Nigeria. *Global Journal of Educational Research* 20, 163-171 DOI: https://dx.doi.org/10.4314/gjedr.v20i2

Kuo-Shu Yuan, Tung-Ju Wu & Hui-Bing Chen, Yi-Bin Li (2017) A Study on the Teachers' Professional Knowledge and Competence in Environmental Education *EURASIA Journal of Mathematics Science and Technology Education* 13(7):3163-3175

Lawal, M. B. (2019). Nigeria's environmental education and awareness raising programme: History, status and challenges, Chapter 24. The Nigerian Environment: Past 100 Years and the Future. Ibadan: Nigeria Environmental Study/Action Team (NEST)

Mansaray, A., & Ajiboye, J. O. (1997). Environmental education and Nigerian students' knowledge, attitudes and practices (KAP): Implications for curriculum development. *International Journal of Environmental Education and Information*, *16*, 317–324.

Nbina, J. B. (2012). Teachers' competence and students' academic performance in Senior Secondary Schools' Chemistry: Is there any relationship? *Global Journal of Educational Research* 11(1), 15-20

Nigatu, B. & Wudu, T (2022) The Current State of Secondary School teachers' morale competence to teach, *Cogent Education*, 9:1, 2154948, DOI:10.1080/2331186X.2022.2154948

Ogar E., C. V et al. (2020). Teachers characteristics, related factors and Environmental Education curriculum implementation in Secondary Schools in Cross River State, Nigeria. GIS Business doi: 10.26643/gis.v1512.18903

Ogunbiyi, J. O. & Ajiboye, J. O. (2009). Pre-service teachers' knowledge of and attitudes to some environmental education concepts using value education strategies. *Anthropologist*, 11(4), 293-301

Ogunjinmi, A.A & Oniya, B.J. (2016). Determinants of Environmental Attitudes and Behaviours of Nigerian Undergraduates: A case of Federal University of Technology, Akure, Nigeria. *Applied Tropical Agriculture*. 21(1), 175-182

Ogunyemi, B. & Ifegbesan, A. (2011). Environmental literacy among preservice social studies teachers: A review of the Nigerian experience', *Applied Environmental Education & Communication*, 10: 1, 7-19.

Olatunde-Aiyedun, T. G. (2020). Fundamentals of Environmental Education. Abuja: Lambert Academic Publishers

Rahman, N. A., Halim, L., Ahmad, A. R., Hassan, A., & Soh, T. M. T. (2018). Teachers' Views on Integrating Environmental Education for Aboriginal Students. *International Journal of Academic Research in Progressive Education and Development*, 7(2), 16–29.

Roczen, N. (2011). Environmental competence: The interplay between connection with nature and environmental knowledge in promoting ecological behavior. Eindhoven: Technische Universiteit Eindhoven. https://doi.org/10.6100/IR719557

Ruiz-Cabezas, A., Medina, M.C., Pérez, E. & Medina, A. (2020). University teachers' training: The digital competence Píxel-Bit. *Revista de Medios y Educación*, (58), 181-215, 10.12795/pixelbit.74676

Sarita Ramsaroop & Hugo van Rooyen (2013). Exploring educator competence in teaching environmental education in schools in Gauteng. *Journal Africa Education Review* 10 (3), 595-613

UNESCO (1985), Environment education module for in-service training of social science teachers and supervisors of secondary schools, 53-55 & 58-59.

UNESCO (1986), Environment Education Module for In-service Training of Science Teachers and Supervisors for Secondary Schools, Division of Science and Technology and Vocational Education, UNESCO-UNEP, 88-93

Vitello, S., Greatorex, J., & Shaw, S. (2021). What is competence? A shared interpretation of competence to support teaching, learning and assessment. Cambridge University Press & Assessment.

Yeşilyurt, M., Özdemir Balakoğlu, M., & Erol, M. (2020). The Impact of Environmental Education Activities on Primary School Students' Environmental Awareness and Visual Expressions. *Qualitative Research in Education*, 9(2), 188-216. doi:10.17583/qre.2020.5115