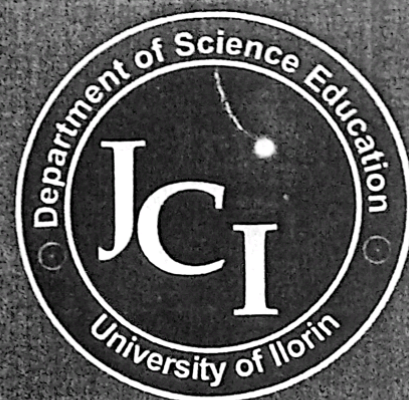


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**DEPARTMENT OF SCIENCE EDUCATION,
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NOTE FOR CONTRIBUTORS

The Department of Science Education, University of Ilorin, Nigeria, journal titled **JOURNAL OF CURRICULUM AND INSTRUCTION** publishes papers that report results of research, as well as descriptive, interpretive and persuasive articles related to curriculum and instruction which include:

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- (b) Instructional theory and practice;
- (c) Educational technology;
- (d) Subject methodology;

The journal is published twice in a year (July and December). Two annual issues constitute one volume.

1. Articles should not exceed 15 pages (including references and appendices) in length. They must be typewritten, double-spaced on A4 size sheets. Ample margins should be provided.
2. Each article should be preceded by an abstract of not more than 200 words.
3. The title of the paper, the author's name and address, should accompany each article on a separate page for proper identification and recognition.
4. Footnotes are not acceptable except on the front page where they may be used to identify the author(s) or the article.
5. The editorial board of the Journal of Curriculum and Instruction adopts the APA (manual) 4th edition, 1997 style as a guide for preparing a journal article.
 - (a) Tables and figures should be as few as possible. Small tables may be more than one on a page. All figures should be camera ready.
 - (b) All references in the text must be accounted for at the end of each article. The list of references must be in alphabetical order. Representative examples below.
Representative examples:

BOOKS

- Abdullahi, A. (1982). *Science teaching in Nigeria*. Ilorin: Author.
- Bajah, S.T. (1983). *Teaching integrated science creative* (1st Ed). Ibadan. University Press.
- Fafunwa, B.A. (1972). The purpose of teacher education. In A. Adaralegbe (Ed). *A philosophy for Nigerian education* (pp. 22-33). Lagos: Heinmann Education Books.

JOURNAL ARTICLES

- Ajayi-Dopemu, Y. (1985). Effect of visual illustration on students learning. *Africa Journal research in Education*, 1(1). 126-130.

THESIS

- Oni, E.B. (1985). *Proposing a learning resources centre: A model for secondary schools in Kwara State*. Unpublished Ph.D thesis. University of Ilorin, Ilorin, Nigeria.

- Campbell, R.L. (1974). The effects of instruction in the basic science process skills on attitudes, knowledge and lesson planning practices of prospective elementary school teachers. *Dissertation Abstracts International* (University Microfilms No. 74-2628).

- (c) Quoted passages which are more than three lines should be indented and typed single space. Quotations that are three lines should be enclosed in double inverted commas within the text.

TABLE OF CONTENTS

1.	Views of Kwara State Senior School Biology Teachers on the Status of Ecology Teaching Isaac O. Abimbola & Florence O. Abidoye	1
2.	Effects of Computer Assisted Instruction on the Learning of Introductory Technology in Junior Secondary Schools in Lokoja Metropolis of Kogi State. Tolorunleke Reuben Tunde	11
3.	Developing Entrepreneurial Mind-Set Through Curriculum Innovation in the School System -Rotimi William Okunloye & Ignatius Joseph Obeng	18
4.	Managing the Pre-Tertiary Education for Poverty Alleviation in Nigeria. A.Y. Abdulkareem & Y.A. Fasasi	23
5.	Information and Communication Technology in the Nigerian School System: Challenges and Possibilities. Tolorunleke, Reuben Tunde	28
6.	Parenting and Counseling Roles in Implementing the Objectives of the New Roadmap for Nigeria Education. Ehindero, Serifat Adefunke	34
7.	The Attitude of Students towards the Teaching and Learning of Social Studies Concepts in Colleges of Education in Ghana. David Asakiba Ayaaba	41
8.	Pre-National Diploma Programme as a Predictor of Students' Performance in National Diploma Mathematics Courses. Suleiman Bashir	49
9.	Science Education in the Waves of Education Sector Reform in Nigeria: Beyond Mergers, Realignment, Policy Reversal and Access. D. I. Wushishi	54
10.	Comparative Effectiveness of the Use of Colour and Black and White Photographs for Teaching the Morphology of Flowers. Rachael Adebayo, PhD	63
11.	Instructional Materials Production in Teacher Education Programmes: An Assessment of OAU Students' Efforts. Oyeniran, F. M., Idowu, L. & Egbedokun, A. O.	68

VIEWS OF KWARA STATE SENIOR SCHOOL BIOLOGY TEACHERS ON THE STATUS OF ECOLOGY TEACHING

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Abstract

This study examined the views of Biology teachers on the status of ecology teaching in Kwara State. This study sample included one hundred and forty two (142) secondary Schools selected by random sampling technique. The researcher designed teachers' questionnaire which were administered to four hundred and fifty (450) teachers selected from eight (8) Local Government Areas of Kwara State. Researcher-designed validated questionnaire was used to elicit information from the respondents on the status of ecology teaching. Three research questions and two hypotheses were formulated. Frequency counts and chi-square statistics were used to analysis the data collected. Finding of this study revealed that 68% of Biology teachers agreed with the contents while 32% disagreed. However both male and female Biology teachers viewed ecology teaching the same way that is ecology teaching was not properly done due to lack of instructional materials. Similarly, experienced and less experienced teachers had similar views about ecology teaching in Kwara State. Based on the findings, the following were recommended: adequacy of resources for Ecology teaching in schools should be provided, teachers should be sponsored to seminars and workshops specifically on Ecology teaching.

Introduction

Ecology, an aspect of Biology, is the study of interactions of organisms with their physical environment. Ecological studies deal with the three levels of organization of the organism, that is, the individual, population and communities. Ecology has many useful applications aimed at maintaining a healthier and more productive biosphere for the life of humans and other living organisms. It provides for the judicious use of natural resources often referred to as conservation. This subject is studied in Secondary Schools, Colleges of Education, Polytechnics and Universities.

Secondary schools are established to primarily train students for the award of Senior School Certificate in Education. The focus of the secondary schools is to produce students that will proceed to tertiary institutions for further education.

Some researchers reports show that teachers found some concepts in ecology difficult (Ndukwe, 1988). Okeke and Ochuba (1986) worked on the level of understanding of ecological concepts. The study revealed low understanding of the three selected concepts by secondary school certificate students on some selected ecology concepts such as population, habitant and ecosystem. Apart from the three selected concepts, the findings call for further investigations of the other ecology concepts so as to improve the understanding of these concepts among secondary school students and to know the best method to be employed in teaching them. Jegede and Lagoke (1986) worked on the status of ecological field works in Nigerian secondary schools and found out the teachers did not have a positive attitude towards the teaching of ecological work. Adeniyi (1985) worked on misconceptions held by junior secondary school students in selected ecological concepts and found out that the absence of Yoruba equivalent of the ecological concepts was a factor for such misconception held by students. Ugwuandu (1984) worked on problems of teaching ecology and genetics at the secondary school level and found that teachers found some concepts difficult to teach. Abidoye (2010) found the results of students in Biology Examination conducted by WAEC discouraging. It is shown below in table 1.

Table 1: The Nation-Wide statistics of performance in Science and related subjects in May/June, 2008-2010 Senior School Certificate Examinations

Year	Subject	Total Enrolment	Total Sat	A1- C6 (% Pass)	D7- E8 (% Pass)	TOTAL NO A1-E8	F9 % Failure
2008	Biology	1285048	1259965 (98.1)	427844 (33.9)	329961 (26.2)	757605 (60.1)	484071 (38.4)
	Chemistry	428513	418423 (98.0)	185949 (44.4)	114697 (27.4)	300646 (71.9)	110417 (26.4)
	Physics	424893	415113 (97.7)	200345 (44.3)	91116 (22.0)	291461 (70.2)	116776 (28.1)
2009	Biology	1364655	1340206 (98.2)	383112 (28.6)	413014 (30.8)	796126 (59.4)	471312 (35.2)
	Chemistry	478235	468546 (98.0)	204726 (43.7)	114020 (24.3)	318746 (68.0)	119260 (25.5)
	Physic	474887	465636 (98.1)	222722 (47.8)	141595 (30.4)	364317 (78.2)	79919 (17.2)
2010	Biology	1325408	1300418 (98.1)	427644 (33.9)	329961 (26.2)	757605 (60.1)	484071 (38.4)
	Chemistry	477573	465643 (97.5)	236043 (50.7)	109944 (23.6)	346003 (74.3)	988165 (21.1)
	Physic	475414	463755 (97.6)	237756 (51.3)	122417 (26.4)	360173 (77.7)	84716 (18.3)

Source: Statistics Section West African Examinations Council (WAEC) Office Yaba, Lagos (2011).

The results in table 1 shows a decline in students' performance in years sampled, 2008-2010. The percentage of students that had credits was very low compared to the total entry. In 2008-33.9%, in 2009-28.6% and in 2010-33.9% throughout the examination results, the performance of biology students was always below 60% of the total number students who offered biology in the external examination. In the years 2008, 2009 and 2010. The percentage failures were 38.4%, 35.2% and 38.4%. It could therefore be seen from the table that percentage failure of students' performance increased yearly.

The results above showed are the same for all the senior secondary schools in Nigeria. Many reasons have been advanced for the poor performance such as:

- (i) Negative attitude of both teachers and students (Akintoye & Shofuyi, 2002)
- (ii) Lack of adequate laboratory equipment (Jimoh, 1992)
- (iii) Some teaching methods adopted by Biology teachers (Harbor – Peters & Ogomeka, 1991)
- (iv) Teachers' difficulty in understanding and teaching of certain Biology concepts (Abimola, 1998)
- (v) Inadequate coverage of the Biology syllabus (WAEC, 1985).

Ecology is one of the difficult concepts to both teachers and students of Biology (Abimbola 1998: NERDC, 1993: Oyeyemi 1991 & Ugwuandu, 1984, Soyinka 1983 & WAEC, 1998 – 2000). Researchers reported that most teachers in Nigeria secondary schools grossly neglect the teaching of ecology like that of genetics. The Chief Examiner's report on Ecology revealed low achievement in ecology by students (WAEC, 2004). In all the studies examined, ecology was difficult due to the following reasons:

- (I) Neglect of ecology by most secondary school teachers
- (ii) Academic ability and area of specialization of teachers

None of the studies above examined knowledge of teachers and experience of biology teachers. Hence, the need for this study.

Purpose of the Study

The purpose of this study was to determine the influence of gender and experience of Biology teachers on their views about the status of ecology teaching in Kwara State.

Research Questions

There were three research questions and two hypotheses. They are

- (I) What is the status of ecology teaching in senior secondary schools in Kwara State as viewed by Biology teachers?
 - (ii) Do the views of Biology teachers' on ecology teaching vary with their gender?
 - (iii) Do the views of Biology teachers' on ecology teaching vary with their teaching experience?
- The hypotheses are
- (iv) There is no significant difference between male and female biology teacher on the status of ecology teaching
 - (v) There is no significant difference between the experienced and less experienced biology teachers on the status of ecology teaching

A total of one hundred and forty two (142) public schools were sampled for the study. Five hundred questionnaires copies were given to Biology teachers across the sampled public schools for study, but four hundred and fifty copies were filled and returned.

Data Analysis and Results

Table 2: Number and Percentages of Teachers' Responses

Variable	Number of teachers	Total	Percentage distributed
Male	276	450	61.3
Female	174		38.7
Less -experience	182	450	40.4
Experienced	268		59.6

Table 2 shows the distribution of four hundred and fifty (450) respondents involved in the study. Four hundred and fifty respondents were distributed into two variables i.e. gender and year of teaching experience. There were 276 males and 174 female respondents and there were 182 less experienced and 268 experienced teachers.

Research Question 1: What is the status of Ecology teaching in senior secondary schools in Kwara State as viewed by Biology teachers?

Table 3: The number and percentages of Teachers' responses on Ecology Teaching

Contents	Agreed %	Disagreed %	Total %
General responses of the teachers	68	32	100

The general response to the contents was that 68% of the Biology teachers agreed that teaching of Ecology was not done properly and 32% said it was alright. This shows that there should be improvement on the status of Ecology teaching by the Biology teachers. The total respondents percentages was hundred percent.

Research Question Two: Do the views of Biology teachers' on Ecology teaching vary with their gender?

Research Question Three: Do the views of Biology teachers' on Ecology teaching vary with their teaching experience?

Table 4: Chi-square analysis of average overall of the responses on the basis of gender (male and female) and teaching experience (less experienced and experienced) biology teachers on the status of ecology teaching

Gender	χ^2	Teaching Experience	χ^2
Male	0.67	Less-experienced	0.56
Female		Experienced	

The average results of the analysis related to the research questions as are shown in table 4.

From Table 4, the Chi-square calculated (X^2 Cal) was 0.67, while the table value was 3.84 at 0.05 alpha levels, with degree of freedom of 1 this shows that the views of Biology teachers on the teaching of Ecology did not vary significantly with gender. With this, the null hypothesis (H_{01}) was not rejected.

Similarly, the calculated X^2 for experience of teachers was 0.56 while the table value was 3.84. Therefore H_{02} was not rejected.

This table 4 shows that both the male and female have similar opinion to that of the experienced and less experienced Biology teachers about the teaching of Ecology in Kwara State, that is, Ecology teaching was not properly taught.

Summary of Major Findings

In this study, the major findings are

- (i) Ecology teaching was accorded low status in Kwara State with 68% agreement of Biology teachers that said that there should be improvement in the Biology curriculum of some Ecology concept that are lacking.
- (ii) Both male and female biology teachers agreed that ecology teaching was not properly done due to lack of instructional materials.
- (iii) Experienced and less experienced teachers agreed that ecology teaching was not properly done.

Discussion of Results of Status of Ecology Teaching

In this study, it was found out that ecology teaching had low status in Kwara State. The finding agreed with those of Okeke and Ochuba (1986), Jegede and Lagoke (1986), Adeniyi (1985), Ugwuandu (1984).

The results of the study indicated that many Biology teachers had the views that the status of teaching is very important in the teaching of Ecology. The views of the experienced Biology teachers were found out that the Ecology teaching was not properly done.

With respect to the gender, the male agreed with their female counterparts that Ecology Teaching was poor due to lack of instructional materials. The findings agreed with those of Alasi (1998), Oyebanji (2000) and Weleh and Lawrence (1982). The experienced and less experienced teachers agreed that ecology teaching was not properly done as a result of not exposing the Science teachers to seminar and workshop. The finding agrees with those of Ndukwe (1988), Abdullahi (1983), Fafunwa (1974), Balogun 1982 and Saha (1983).

Recommendations

Adequate resources for ecology teaching in schools should be provided for science subjects generally and ecology aspect of Biology, in particular. Teachers should be sponsored to seminars and workshops specifically on ecology teaching.

Suggestions for further Studies

The following suggestions are made for further studies: this research work can be replicated in other part of Kwara State of the country since this study is limited to eight Local Government Areas of Kwara State. Also the Science education students could start from where this work end by creating many instructional aids that could be used to teach Ecology and other concept that are perceived difficult by many Biology teachers.

Moreover, other researchers can equally examine other variables such as area of specialization, type of schools and others that have not been addressed in this study.

Appendix

Chi-square Analysis of the Responses on the basis of gender (Male and Female) and Teaching Experience (Less experienced and experienced) Biology Teachers on the Status of Ecology Teaching

S/No	Contents	Gender	2	Teaching Experience	2
1	Ecology in the curriculum is arranged in a conceptual manner	Male Female	1.57	Less experienced Experienced	0.02
2	Learning about eco systems should involve field work	Male Female	1.65	Less experienced Experienced	0.26
3	Specific samples illustrative of adaptive features of organisms should be brought into the class room	Male Female	0.27	Less experienced Experienced	0.004
4	Emphasis should be placed on identifying adaptive features of organisms.	Male Female	0.64	Less experienced Experienced	0.004
5	Food scarcity as an ecological problem should be emphasized.	Male Female	0.96	Less experienced Experienced	1.98
6	Some important ecology concepts are lacking in the Biology curriculum.	Male Female	0.58	Less experienced Experienced	1.00
7	In studying an ecosystem, sizes of ecosystem and population of many organisms should be determined.	Male Female	0.96	Less experienced Experienced	1.04
8	The biology curriculum is loaded with too many ecology concepts.	Male Female	0.10	Less experienced Experienced	0.70
9	The arrangement of ecological concepts in such a way that they run throughout the three year course is convenient for teaching.	Male Female	1.94	Less experienced Experienced	0.63
10	Non availability of Biology textbooks affects the teaching of ecology in senior secondary schools.	Male Female	1.21	Less experienced Experienced	0.011
11	Actual measurements of ecological factors should be taken.	Male Female	0	Less experienced Experienced	0
12	The students should be guided to study an ecosystem.	Male Female	0	Less experienced Experienced	0
13	A field trip should be made to a biotic community.	Male Female	0	Less experienced Experienced	0

14	Students should collect organisms from the ecosystems and classify them as producers, consumers or decomposers.	Male Female	0	Less experienced Experienced	0
15	Students should be able to measure or estimate sizes of some ecosystems.	Male Female	0.15	Less experienced Experienced	0.34
16	Students should be able to give names of organisms typical of each community	Male Female	2.08	Less experienced Experienced	0.55
17	Students should be able to describe each of the factors and point out their relative importance.	Male Female	0.01	Less experienced Experienced	0.16
18	The factors which affect water retentivity of soil-types and determine the amount of water each soil type can hold should be known by the students.	Male Female	0.30	Less experienced Experienced	0.11
19	Students should be guided to study land ecosystem.	Male Female	2.22	Less experienced Experienced	0.01
20	Interpretation of graphs showing ecological factors of an area should be determined.	Male Female	0.03	Less experienced Experienced	0.86
21	Students should be able to name soil types and discuss their effects on vegetation.	Male Female	0.20	Less experienced Experienced	0.28
22	Students should be able to demonstrate how climatic factors are measured.	Male Female	0.78	Less experienced Experienced	0.55
23	Students should be able to state the sources of energy in an ecosystem.	Male Female	0.76	Less experienced Experienced	1.13
24	Students should be able to recognize that food relationship exists among living things.	Male Female	0.78	Less experienced Experienced	0.55
25	Students should be able to use the knowledge of energy losses in the ecosystem to explain the pyramidal shape of feeding relationships.	Male Female	0.22	Less experienced Experienced	1.13
26	Students should be able to identify some associations which are beneficial, harmful and neutral to each of the organisms of the association.	Male Female	0.10	Less experienced Experienced	0.51
27	Students should be able to recognize that living things possess a range of tolerance to environmental factors.	Male Female	1.63	Less experienced Experienced	2.43

28	Students should be able to recognize that the availability of water is the principal factor for the distribution of plants and animals.	Male Female	0	Less experienced Experienced	0
29	Students should be able to observe characteristics of the mode of life of a given organism	Male Female	0.03	Less experienced Experienced	0.86
30	Students are to copy and memorize notes for examination.	Male Female	3.78	Less experienced Experienced	0.02
31	Students are to find out definitions of terms from textbooks.	Male Female	0.19	Less experienced Experienced	0.01
32	Ecological pyramids should be drawn for the students.	Male Female	0.11	Less experienced Experienced	0.86
33	Tests, quizzes and examinations should require students to know definitions.	Male Female	0.18	Less experienced Experienced	0.00
34	Skills in using equipment like quadrat, barometer and rain gauge are tested and used as students' evaluation.	Male Female	0.01	Less experienced Experienced	0.44
35	Sometimes, I use demonstration method to teach the students ecology.	Male Female	0.23	Less experienced Experienced	1.32
36	I always accept class discussion when teaching the students ecology.	Male Female	0.11	Less experienced Experienced	2.37
37	I never used lecture method to teach the students	Male Female	0.71	Less experienced Experienced	0.003
38	I give assignments to the students.	Male Female	0.17	Less experienced Experienced	1.27
39	I rarely accept individual projects from the students	Male Female	0.06	Less experienced Experienced	0.02
40	The graphic method is used to interpret the graph.	Male Female	1.68	Less experienced Experienced	0.59
41	The field work of teaching method is used for field studies	Male Female	0.75	Less experienced Experienced	0.01
42	Laboratory method is used to teach the practical lesson.	Male Female	0.17	Less experienced Experienced	0.38
43	Some of the ecological habitats recommended for study are available in the school environment.	Male Female	5.30	Less experienced Experienced	0.02
44	Biology laboratory is always available for practical lessons.	Male Female	0.32	Less experienced Experienced	0.30

45	There is ample space to construct an ecological garden on the school compound.	Male Female	0.17	Less experienced Experienced	0.05
46	There is space for field studies within the school environment.	Male Female	0.25	Less experienced Experienced	0.12
47	Students are not more than fifty in Biology lessons	Male Female	0.13	Less experienced Experienced	0.04
48	The minimum number of basic ecological materials possessed in my school is sufficient.	Male Female	0.99	Less experienced Experienced	1.79
49	Instructional materials in the school are sufficient for the Biology teacher.	Male Female	0.01	Less experienced Experienced	0.23
50	The principal's support for biology teaching in my school is encouraging.	Male Female	0.30	Less experienced Experienced	0.12
51	Biology textbooks in my school are enough.	Male Female	0.002	Less experienced Experienced	0.06
52	The number of Biology teacher(s) in my school is sufficient.	Male Female	2.48	Less experienced Experienced	0.18
53	Many of the ecological instruments (rain gauges, wind-vane) are available in the school.	Male Female	0.54	Less experienced Experienced	1.08
54	There is a biology laboratory in my school	Male Female	0.01	Less experienced Experienced	2.32
55	The biology laboratory is used for practical lessons.	Male Female	0.01	Less experienced Experienced	0.94
56	Practical on ecology is carried out in the laboratory.	Male Female	0.33	Less experienced Experienced	0.25
57	There is enough equipment in the laboratory.	Male Female	0.10	Less experienced Experienced	0.13
58	There are laboratory enough attendants in my school.	Male Female	1.87	Less experienced Experienced	0.07
59	There are puddles and a pond in my school.	Male Female	0.21	Less experienced Experienced	0.001
60	Stream and river which can be used to study ecosystems are available in my school.	Male Female	0.14	Less experienced Experienced	1.63
61	Bushes are present in the school premises to study ecosystems.	Male Female	0.58	Less experienced Experienced	1.01
62	Measuring instruments for sizes of the ecosystem are present.	Male Female	0.96	Less experienced Experienced	1.04
63	There are various charts, photographs, films of different biotic communities in Nigeria in the school.	Male Female	0.10	Less experienced Experienced	0.70

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