Reducing Teachers Instructional Difficulties in Identified Content Area of Agricultural Science Syllabus of Senior Secondary School for Better Understanding in Nigeria

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ABSTRACT The study examined some areas of the Senior Secondary School Certificate syllabus which teachers find difficult to teach and students find difficult to understand. One hundred teachers and one hundred and fifty students constituted the sample of the study while all the teachers and students in the North Senatorial District of Delta State served as the population. A 28 item questionnaire served as instrument for collecting data while mean and t-test were employed in the analysis of data. Findings include that there is no significant difference between the areas teachers find difficult to teach and areas students find difficult to understand, that sex of the teachers have no significant effect in teaching the identified content areas of the syllabus and that level of qualification affects the ability to teach the identified areas. Recommendations amongst others include the employment of qualified teachers in the basic sciences of Biology, Chemistry and Geography; the reduction of teaching load of Agricultural Science teachers and sponsorship of Agricultural Science teachers to seminars, workshops and in-service training.

INTRODUCTION

Agriculture and its role in the economy of developing countries such as Nigeria has been variously discussed by many scholars (Anthonio, 1979; Aina, Kaniki and Ojiambo, 1995; Akobundu, 1987; Nmerole, Egun and Jibunoh, 1997) and expressed as policy issue in education by government (National Policy on Education (NPE) 1981; revised 1998). It has also been acclaimed as one of the sciences that is an embodiment of other sciences (Egun, 2002 and Maduabum, 1993) and the social science of economics and geography (Awaritefe, 1986).

Good production in Agriculture entails effective utilisation of the soil in a sustainable manner based on the understanding of the physical, mineral composition of the soil and the appreciation of the chemical activities/reactions in the soil. Some scholars in science education curriculum studies (Reynolds, 1994; Fakunle, 1986; Oyewole, 1982; Okpala, 1991 and Odjugo, 1993) have expressed the view that many teachers have phobia towards teaching concepts of chemical combination and reaction, plant anatomy and physiology, genetics and ecology in the prescribed scheme of work for the Senior Secondary Certificate Examination of West African Examination Council (WAEC) and National Examination Council (NECO).

The consequence of this phobia is misconception of the biological concepts, chemical expressions and related geographical topics which are applied to Agricultural Science; with the resultant effect of poor performance in the prescribed examinations. The appreciation of this problem in teaching and learning of Agricultural Science has necessitated a study of the perceived teachers instructional difficulties in some content areas of SSS Agricultural Science for sustainable Agricultural development in Nigeria.

Statement of the Problem

The problem of the study is what areas of the Senior Secondary School Agricultural Science that have relevance to biology, chemistry and geography, do teachers find difficult to teach and learners find difficult to understand?

In the main, the study is to identify difficult areas in Agricultural Science scheme; assess if difficulty to teach is biased for teacher gender; and level of qualification.

Significance of the Study

The identification of problem area in the curriculum, teaching of Agricultural Science will be less tedious to teachers and bring about better understanding on the part of students. Besides, the society will benefit from increase in food production as the soil will be better handled for sustainable production. Animal production may also increase.

METHODOLOGY

The study employed a survey design in which 100 teachers and 150 students were selected from the North senatorial district of Delta State using stratified sampling technique.

Questionnaire served as instrument for collecting data both from students and teachers. Validation was done by experts in Agriculture and related subjects; and reliability co-efficient of 0.72 and 0.76 respectively were obtained.

The research questions were addressed using percentages and means while t-test statistics at 0.05 safety margin (level of significance) was employed in testing the hypothesis. Three research questions and two hypotheses guided the study. Mean of 3.00 was set as cut-off point; that is, all scores of 3 and above were accepted as difficult while scores below 3 were regarded as being easy to teach and understand.

Research Question

1. What content area of SSS Agricultural Science do teachers find difficult to teach?
2. What content area of SSS Agricultural Science as taught by teachers do students find difficult to understand?
3. What are the probable reasons for teachers difficulties in teaching areas identified?
4. Is the teachers sex a factor in ability to teach the identified difficult areas?

Hypothesis

1. There is no significant difference between the areas identified as difficult to teach by teachers and the areas identified as difficult to understand by students.
2. There is no significant difference in difficulty in teaching the identified areas based on the sex of the teacher.
3. There is no significant difference in the areas teacher find difficult to teach based on their qualification.

RESULTS

Research Question 1

Table 1 shows that item nos. 2, 3, 4, 8, 9, 10, 11, 12, 13, 14, 20, 22, 23, 26, 27 and 28 are difficult to teach by the teachers; with item nos. 8 through

Table 1: Mean rating by teachers and students of areas of agricultural science syllabus. teachers find difficult to teach and students find difficult to understand

Item	Content Area Photosign Thesis	Teachers	Students
1	Day light reaction	2.5	2.61
2	Dark reaction	3.2	3
3	Ductless glands	3.46	3.51
4	Conservation of natural resources	2.6	2.64
5	Pollution of soil/degradation	2.12	2.16
6	Soil organisms	2.04	2.06
7	Climatic zones	3.26	3.46
8	Properties of soil	3.62	3.84
9	Soil pH	4.2	4.35
10	Soil Acidity	3.86	3.92
11	Soil Alkalinity	3.77	3.69
12	Hydrolysis in the soil	3.42	3.62
13	Oxidation in the soil	3.22	3.46
14	Chemical weathering	3.62	3.75
15	Digestive system	2.45	2.67
16	Respiratory system	1.95	2.01
17	Excretory system	2.78	2.92
18	Nervous system	2.1	2.64
19	Reproduction system	1.84	2.01
20	Biology of heredity	3.62	3.75
21	Bacterial diseases	2.72	2.81
22	Virus diseases	3.24	3.46
23	Fungus diseases	3.1	3.32
24	Propagation by cutting	1.42	1.52
25	Propagation by seed	1.15	1.28
26	Propagation by crafting	3.45	3.67
27	Propagation by layering	3.17	3.24
28	Propagation by bedding	3.16	3.72
	Σ	81.04	85.09
	$\bar{x}$	2.89	3.04

14 ranking highest in difficulty in teaching by teachers.

Research Question 2

Table 1 shows that the rating of students in the content area follows same pattern as the rating by teachers. The implication is that the areas teachers find difficult to teach, students also have difficulty in understanding.

Research Question 3

Table 2 shows that all the items make for the difficulty of teaching the identified content area of Agricultural Science. Items 1, 2, 4, 5, 9 and 10 were scored highest, virtually as the principal reasons for the difficulty in the teaching of the content area of Agricultural Science syllabus. Items 2 and 4 with 3.72 and 4.83 respectively ranked highest in the scores.

Table 2: Mean distribution of the rating of possible reasons for teachers difficulty in the identified content area of agricultural science syllabus

	Content Area	Mean
1.	Lack of relevant instructional material	3.41
2.	The subject's wide coverage	3.72
3.	Lack of suitable textbooks	3.46
4.	Shortage of professionally trained teacher	4.83
5.	Too much work load on the teachers	4.10
6.	Students lack of interest	3.78
7.	Lack of Agricultural Science laboratory	3.85
8.	Lack of teaching aids	3.76
9.	Most of the areas can not be explained with local example	4.32
10	Refresher courses/in-service/workshops are not organised for teachers to educate them	4.80

Hypothesis 1

There is no significant difference between the areas identified as difficult to teach by teachers and the areas identified as difficulty to understand by students.

From the table above, the calculated-t (1.50) is less than table critical value of 1.96. Therefore, the hypothesis of no significant difference in the opinion of teachers and students in the teaching and understanding of the identified areas in the syllabus is accepted.

Hypothesis 2

There is no significant difference in difficulty of teaching the identified areas in the syllabus based on sex of the teacher.

Table 4 above shows no significant difference between male and female teachers perception of difficulty in teaching the identified content area of Agricultural Science syllabus. The table critical value (1.96) is higher than the calculated-t value (0.45). The hypothesis of no significant difference between male and female teacher perception of difficulty in teaching the identified areas in the syllabus is therefore accepted.

Hypothesis 3

There is no significant difference in the areas teachers find difficult to teach based on their qualification.

From the table 5, cal-t value (2.34) is higher than t-critical value (1.96). The implication is that the hypothesis of no significant difference between the mean rating of difficulty in teaching the identified areas of the syllabus are influenced or affected by qualification. The hypothesis is therefore rejected.

DISCUSSION

Items 8 through 14; areas having to do with understanding of Chemistry and Biology ranked highest in the areas identified by teachers and students as difficult in teaching and learning respectively. Ogunlano (2000) has reported the dearth of Chemistry teachers in schools. Shola (2001) collaborated this when he reported that

Table 3: t-test analysis of teachers and students mean rating of difficult areas to teach and understand respectively.

Source	N	$\bar{x}$	SD	SE	df	t-cal	t-table	Remark
Teachers	100	2.89	0.757	0.143	248	1.50	1.76	Not Significant
Students	150	3.04	0.786	0.149				

Sig. α at 1.96

Table 4: t-test analysis of teachers mean rating on difficulty of teaching the identified areas based on sex.

Source	N	$\bar{x}$	SD	SE	df	t-cal	t-table	Remark
Male	60	3	1.483	0.191	98	0.45	1.96	Not Significant
Female	40	2.83	1.763	0.278				

Table 5: t-test analysis of mean rating of graduate and non-graduate teachers on difficulty in teaching identified areas of the syllabus.

Sex	N	$\bar{x}$	SD	SE	df	t-cal	t-table	Remark
Graduate	57	2.84	1.34	0.178	98	2.34	1.96	Significant
Non-graduate	43	3.00	1.52	0.232				

Sig. at α 1.96

the choice of science courses in secondary schools are being influenced by lack of effective teaching of Chemistry as a subject in school resulting from lack of teachers. He concluded that the phenomena will negatively affect the choice and performance of students in those subjects which will require the knowledge and application of basic chemistry principles. Madumbum (1993) reported low entry of teachers into Biology and predicted that subjects needing the understanding of biological concepts may suffer in due course of time if measures were not taken to attract new recruits into the course.

The study of agricultural zones require an appreciation of climatology and its effects on agricultural activities. It connotes the understanding of forces of nature in shaping agricultural practices and spread of pests and diseases. The understandings are in the teaching of geography; but Eduwen (1993); Isah (2001) and Laogun (2002) have expressed the fear that if the current tread of entry into geography classes continues, many schools will be without geography teachers in 2010. Eduwen (1993) also discussed problems in teaching of geography which included shortage of professionally trained teachers and subject wide coverage.

On possible reasons for teacher difficulty in teaching the identified content areas, all the items of 1-10 were rated 3.41 and above. However, item 4 and 10, holding to shortage of professionally trained teachers and non-organisation of refresher courses for teachers of agricultural science as reasons for difficulty in teaching the identified areas were scored 4.83 and 4.80 respectively. This agrees with Eduwen (1993).

Results of table 3 indicate no significant difference in the mean rating of both teachers and students in difficulty of teaching and learning respectively. By implication, teachers find it difficult to teach as the student find it difficult to learn. There is the need therefore to adopt measures that will improve teaching and learning for both teachers and students. There is the need to prepare teachers more for better teaching through designs that will enhance their effectiveness and influence learning in the classroom, since what the teacher has he gives to the students (Obaje, 1999).

Table 4 shows no significant difference between the mean rating of male and female teachers in teaching the identified content areas of the syllabus. Calculated value (0.45) is less

than the critical table value (1.96). This is in agreement with the findings of Odunsi (1982), Olson (1983), Fieldman (1993), Wiseman et al (1995), Obodo (1996) and Onu (1990). Their studies concluded that sex plays no significant role in performance on science and technology.

Table 5 shows that calculated t-value (2.34) is higher than critical table value (1.96). This shows that there is a relationship between the areas teachers find difficult to teach and their academic qualification. The higher mean score of 3.215 by Nigeria Certificate in Education (N.C.E.) holders above their University degree certificate holders (2.84) shows that the N.C.E. holder find the identified areas more difficult to teach. This necessitate an upgrading training programme to reduce difficulty in these identified content areas of the syllabus. The high mean score agrees with Findlay (1988), Tibi (1997), Morris (1998), Mamma (1994), Olaitan and Okorie (1988) and Egun (2002) that a single training in a teacher preparation will not suffice in any modern dynamic society that is influenced by science and technology.

RECOMMENDATIONS

The analysis of the identified content areas have learning with the basic sciences and geography. It is therefore necessary that teachers of these basic sciences in schools be properly prepared and their number in schools be enhanced.

Attention of curriculum designers should focus on these identified problem areas of the syllabus with the aim of seeking appropriate solutions to them. The identified difficult areas of the syllabus are basically inferred from other subjects of Chemistry, Biology and Geography. The teachers of these subjects should be encouraged through the provision of allowances and more training opportunities opened to new entrant. Better qualified teachers should be employed; seminars and workshop made available to existing teachers in order to increase their knowledge in modern approaches to science education. In addition, refresher courses spanning over relatively short periods should be organised for teachers.

The teaching load of teachers of agricultural science teachers in schools should be reduced. The teachers opined (Table 2) that too much teaching load is a factor to finding it difficult to

teach some content area. This no doubt is expressed in the available preparation for class lessons. Less teaching load would provide the teachers the needed time to adequately prepare the class lessons.

Knowledge is meaningful when it can be put to effective use through local application. Teachers should therefore be encouraged to improvise and use instructional materials to reduce the degree of alistruction of syllabus content.

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