

Students' Perceptions of the Difficult Topics in Biology at Senior School Level in Delta State, Nigeria

Igbojinwaekwu Patrick Chukwuemeka^{1*}, Theresa Ebiere Dorgu²

¹PhD, Department Of Science Education, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

²PhD, Department Of Arts Education, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

*Corresponding author: Igbojinwaekwu Patrick Chukwuemeka

| Received: 10.02.2019 | Accepted: 20.02.2019 |

Published: 28.02.2019

DOI: [10.21276/jaep.2019.3.2.4](https://doi.org/10.21276/jaep.2019.3.2.4)

Abstract

This study dealt with finding the topics perceived to be difficult in Biology by Senior School students in Isoko North Local Government Area of Delta South Senatorial District of Delta State. The researchers adopted descriptive survey research design in carrying out this study. Six research questions were formulated to guide the study. The population of the study was 904 Senior School III students. 200 (130 female and 70 male) Senior School III formed the sample. The instrument used for data collection was Student's Perception on the Difficult Topics in Biology. Cronbach Alpha statistic revealed that the reliability index of the instrument was 0.81. The instrument contained Biology topics as contained in West African Senior School Certificate Examinations Syllabus and Regulations, which the respondents responded to on the basis of Very Difficult, Difficult, Very Easy and Easy and rated as 4, 3, 2 and 1, respectively. The percentage statistic was used to analyse data, using 50% as the cut-off. The result of the analysis among others was that nervous co-ordination was perceived as the most difficult topic in Biology by both the male and female Senior School students in Isoko North Local Government Area, Delta State. Recommendations were given to improve teaching and learning strategies.

Keywords: Biology; Biology and Other Science Subjects; Students and Perception of Difficult Topics in Biology; Gender and Perception of Difficult Topics in Biology.

Copyright © 2019: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and sources are credited.

INTRODUCTION

Biology, as one of the natural sciences in the Nigerian Senior School curriculum, is a subject, though not compulsory, is mostly registered/listed by students in the Senior School Certificate Examination (SSCE). This agrees with the findings of [1] that most students prefer registering Biology to other science subjects in the Senior School Certificate Examination, because they feel that it is the easiest among other science subjects at the ordinary level of study. On the contrary, [2] observe a lower percentage performance in Biology than in physics and chemistry at the Senior School Certificate Examination in each of the years, 2000, 2001, 2002, 2003, 2004, 2005, 2006 and 2007. This finding agrees with the finding of [3] that the performance of students in Senior School Biology in the SSCE is very poor when compared with their performances in chemistry and physics. [4] Traced the performance of Senior School students in Biology at Senior School Certificate Examination Level and find a consistent lower percentage score in Biology than in physics and chemistry from 1997 to 2006. [5] States

that the percentage mean achievement scores in Biology, chemistry and physics in Senior School Certificate Examination in 2017 were 52%, 57% and 60%, respectively.

The word Biology was derived from two (2) Greek words, "Bio" and "Logos". 'Bio' means life or living thing, while 'Logos' means study of; Biology, therefore, means the study of living things [6]. According to [7], Biology is a science subject that deals with living things and non living things and their existence and relationship with one another. He stressed that Biology forms the basis for medical, biological and environmental sciences and that is why [8] states that to pursue or to enroll for a course in medicine, pharmacy, agriculture, biological sciences or environmental studies, a pass at credit level and above in Biology in Senior School Certificate Examination is a basic pre-requisite.

Biology, as stated earlier, is not compulsory to students at the Senior School level. So, students have different perceptions towards the learning of Biology.

Highly numeric students perceive Biology as a difficult subject, because of the voluminous note associated with it; other students have negative perception towards the learning of Biology, because of the numerous names associated with it [9, 10]. Method of teaching Biology in the classroom is one of the factors that can impact negative or positive perception towards learning Biology; lecturing method of teaching impacts negative perception to students learning Biology, while practical/laboratory approach of teaching Biology provides students with positive perception towards learning Biology. On gender basis, girls have more positive perception towards learning Biology than boys, because girls tend to like anything that deals with life, while boys prefer subjects (physics and chemistry) that deal with war activities. According to [2], Biology is preferred to other science subjects, because of the fact that the specimens for practical lesson are found in their natural environment and familiar to students.

Finding by [10] in Delta State Capital Territory, indicates that students find it very difficult to understand the concept of plants skeletal system. Supporting this finding, Igbojinwaekwu [11] avers that Senior School Two (SSII) students were unable to score above 50% in test on transverse sections of monocotyledonous and dicotyledonous roots, stems and leaves. Duyilemi [3] was in disagreement with the findings of [10] and Igbojinwaekwu [11]; he found that the concepts of genetics and hereditary were perceived to be the most difficult topics in Biology by Senior School students in Nigeria. Another researcher [6], also, carried out a study on the biological concept perceived by Senior School students to be very difficult to comprehend. He found that ecology was perceived to be very difficult for Senior School students to understand in Delta Central Senatorial District of Delta State, Nigeria.

In Delta State Capital Territory, Ndu, Okeke, Igbojinwaekwu [10] and Igbojinwaekwu [11] found that skeletal system of plants was perceived to be very difficult to understand by Senior School students; Duyilemi [3] found that genetics and hereditary were biological topics perceived to be very difficult to understand by Senior School students in south western Nigeria. Ogenevwede [7] carried out similar study in Delta Central Senatorial District and found that ecology was the biological topic perceived to be very difficult to understand. No such study has been carried out in Delta South Senatorial District of Delta State, hence this study. The problem of the study is stated thus: What is the topic perceived as being difficult by Senior School Students in Isoko North Local Government Area of Delta South Senatorial District of Delta State, Nigeria?

Research Questions

The following six (6) research questions were formulated to guide this study.

1. What topics do students perceive as difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?
2. What topics do female students perceive as difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?
3. What topics do male students perceive as difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?
4. What topics do students perceive as the most difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?
5. What topics do female students perceive as the most difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?
6. What topics do male students perceive as the most difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?

METHODOLOGY

This study adopted a descriptive survey research design. This was because the researchers wanted to know the exact situation of things in respect of this study in its natural environment.

The population of the study was 904 Senior School III (SSIII) students in 16 public secondary schools in Isoko North Local Government Area of Delta State. The sample of the study was 200 SS III students from five (5) public secondary schools in Isoko North Local Government Area of Delta South Senatorial District, Delta State, Nigeria. A simple random sampling technique was used to select five (5) schools out of the 16 public schools and, stratified random sampling technique, to select the 200 SSIII students from the five selected public schools. The sample included 130 female SSIII students and 70 male SSIII students.

The instrument used for data collection was Student's Perception on the Difficult Topics (STUPERDIT) in Biology. STUPERDIT consisted of two parts, A and B. Part A comprised the demographic profile of the respondents, while part B contained the West African Senior School Certificate Examination (WASSCE) Biology topics. In each topic, responses were under (1) Very Difficult, (2) Difficult, (3) Very Easy and (4) Easy, which were rated 4, 3, 2 and 1 points, respectively.

The instrument was validated by three science education experts in Niger Delta University, Nigeria. All their comments were utilized in the final draft of STUPERDIT. Cronbach Alpha statistic was used to determine the reliability index of STUPERDIT as 0.81

and was judged to be good enough for this study. The instrument was researcher made.

Two hundred (200) copies of STUPERDIT were administered to the respondents in their schools and retrieved, immediately, by the researchers. Data collected from the respondents were analysed using simple percentage. The cut-off percentage was 50. The combination of Very Difficult (VD) and Difficult (D) on one hand and Very Easy (VE) and Easy (E) on the other hand was applied.

DATA ANALYSES AND RESULTS

Data collected in this study were analysed to give answers to research questions 1-6.

Research Question 1: What topics do students perceive as difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?

The answer to research question 1 is as shown in table-1.

Table-1: Percentage distribution of students' perception of difficult topics in Senior School Biology

S/N	Item	Very difficult	Difficult	Easy	Very easy	Total
1	Micro organisms and Health	110(55)	60(30)	20(10)	10(5)	200(100)
2	Cell (2) properties and functions	70(35)	50(25)	40(20)	40(20)	200(100)
3	Supporting tissues and systems	70(35)	60(30)	50(25)	20(10)	200(100)
4	Feeding mechanisms and digestive systems	60(30)	70(35)	40(20)	30(15)	200(100)
5	Transport systems and mechanisms	60(30)	70(35)	60(30)	10(5)	200(100)
6	Ecology of populations	20(10)	80(40)	70(35)	30(15)	200(100)
7	Regulation of the internal environment	70(35)	50(25)	50(25)	30(15)	200(100)
8	Nervous co-ordination	70(35)	90(45)	30(15)	10(5)	200(100)
9	Sensory receptors and organs	30(15)	100(50)	60(30)	10(5)	200(100)
10	Variation (adaptation for survival, evolution) and genetics	20(10)	130(65)	50(25)	0(0)	200(100)

Source: Field work 2018

The cut off percentage for table-1 is 50. This is the combination of very difficult and difficult on one hand, and very easy and easy on the other hand. From the above results, ten (10) topics were identified as difficult, because of the percentage summation of difficult and very difficult was up to the cut off percentage of 50. The topics include: Micro organisms and health, cell (2) properties and functions, supporting tissues and systems, feeding mechanisms and digestive systems, transport systems and mechanisms, ecology of populations, regulation of the internal environment,

nervous co-ordination, sensory receptors and organs and variation (Adaptation for survival, evolution) and genetics out of all the topics in Senior School Biology.

Research Question 2: What topics do female students perceive as difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?

The answer to research question 2 is as shown in table-2.

Table-2: Percentage distribution of female students' perception of difficult topics in Senior School Biology

S/N	Item	Very difficult	Difficult	Easy	Very easy	Total
1	Micro organisms and Health	20(15)	50(38)	60(47)	0(0)	130(100)
2	Transport systems and mechanisms	60(44)	30(23)	30(23)	10(10)	130(100)
3	Regulation of the internal environment	60(46)	20(15)	30(24)	20(15)	130(100)
4	Nervous co-ordination	50(38)	50(38)	20(14)	10(10)	130(100)
5	Sensory receptors and organs	20(15)	70(54)	40(31)	0(0)	130(100)
6	Variation (adaptation for survival, evolution and genetics)	10(10)	80(60)	20(15)	20(15)	130(100)

Source: Field work 2018

From the results in table-2, six (6) topics out of the Biology topics in the Senior School Certificate Examination Syllabus, were identified as difficult, with the percentage summation of very difficult and difficult were up to the cut off percentage of 50. These topics include: Micro organisms and health, transport systems and mechanisms, regulation of the internal

environment, nervous co-ordination, sensory receptors and organs and variation (adaptation for survival, evolution) and genetics.

Research Question 3: What topics do male students perceive as difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?

Table-3: Percentage distribution of topics Male students perceive as difficult in Senior School Biology

S/N	Item	Very difficult	Difficult	Easy	Very easy	Total
1	Supporting tissues and systems	10(14)	40(57)	20(29)	0(0)	70(100)
2	Transport systems and mechanisms	0(0)	40(57)	30(43)	0(0)	70(100)
3	Regulation of the internal environment	10(14)	30(43)	20(29)	10(14)	70(100)
4	Nervous co-ordination	20(29)	30(43)	20(28)	0(0)	70(100)
5	Sensory receptors and organs	0(0)	40(57)	20(29)	10(14)	70(100)
6	Variation (adaptation for survival, evolution and genetics)	0(0)	40(57)	30(43)	0(0)	70(100)

Source: Field work 2018

From the results in table-3, six (6) topics were identified to be difficult with the summation of very difficult and difficult which makes up the cut off percentage of 50. These topics include: supporting tissues and systems, Transport system and mechanisms, regulation of internal environment, Nervous co-ordination, sensory receptors and organs and variation (adaptation for survival, evolution and genetics).

Research Question 4: What topic do students perceive as the most difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?

The answer to research question 4 is as shown in table-1. In table-1, the Senior School III students perceive micro organisms and health as the most difficult topic in the West African Senior School Certificate Examinations Biology syllabus.

Research Question 5: What topic do female students perceive as the most difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?

The answer to research question 5 is as shown in table-2. The female students perceive the topic nervous co-ordination, as the most difficult in the West African Senior School certificate Examination Biology syllabus.

Research Question 6: What topic do male students perceive as the most difficult in Senior School Biology in Isoko North Local Government Area of Delta State, Nigeria?

The answer to research question 6 is as shown in table-3. The male students perceive nervous co-ordination as the most difficult topic in the West African Senior School Certificate Examination Biology Syllabus.

DISCUSSION OF FINDINGS

The findings of this study were discussed according to the stated research questions. The first finding of this study is that the Senior School III students perceived 1-10 items of table 1 as difficult topics in the West African Senior School Certificate

Examinations Syllabus. This finding is in disagreement with the finding of [10] that students find it very difficult to understand the concept of plants skeletal system in the study carried out in Delta State Capital Territory. This might be probably because different instruments were used in collecting data. This finding is, also, in disagreement with the findings of Duyilemi [3] who in his study found that students perceive genetics and hereditary as the most difficult topic in the Senior School Biology. This might be probably due to the quality of the samples used in both studies.

The finding that female Senior School III students perceive items 1-6 of table 2 as difficult topics is in disagreement with the findings of Igbojinwaekwu [11] who posits that Biology is the best subject preferred by female students. This disagreement might be probably due to the different research designs and instruments used in conducting the researches.

Another finding in this study is that male Senior School III students find items 1-6 of table-3 as difficult topics to understand. This agrees with the findings of [2] that male students prefer physics and chemistry to Biology. This might be probably because boys are more numeric than girls.

The finding that students, generally, perceive micro-organisms and health as the most difficult topic to understand in the Senior School Biology Syllabus is not in agreement with the finding of Duyilemi [3] who found that the concepts, genetics and hereditary were perceived to be the most difficult topics by the Senior School students in Biology. The reason might be due to difference in instruments used in the study.

The finding that the male and female Senior School III students settled for Nervous co-ordination as the most difficult topic in the Senior School Biology Syllabus may be, probably, due to the difficulty in getting Nervous co-ordination specimen in its natural state. This finding is not in alignment with the findings of Duyilemi [3], [10] and Oghenevwe [6] who found that genetics and hereditary, plants skeletal system and ecology, respectively, are topics perceived to be most difficult to understand in Senior School Biology syllabus. This might be due to differences in samples,

instruments for data collection and the designs of the studies.

CONCLUSION

Topics found to be difficult in the West African Senior School Certificate Examination Biology syllabus were micro organisms and health, cell (2) properties and functions, supporting tissues and systems, feeding mechanisms and digestive systems, transport systems, ecology of populations, regulation of internal environment, nervous co-ordination and organs and variation (adaptation for survival, evolution and genetics). In general, the most difficult Biology topic for the Senior School III students is the concept of micro organisms and health. The male and female students perceived Nervous co-ordination to be the most difficult topic in West African Senior School Certificate Examinations Syllabus.

Recommendations

From the findings of this study, the following recommendations were made.

- Seminars on the best way to teach Biology topics perceived to be difficult by students should be organized for teachers.
- Appropriate and adequate instructional materials to be provided for the teachers for effective and efficient classroom teaching-learning activity.
- Teachers should use student-centered teaching methods in course of teaching the topics to the students.

REFERENCES

1. Aghadiuno, M. C. K. (1989). Comparison between 1962 and 1982 enrolment and performance of students in WASC science subjects. *Journal of science education*. 1(1), 31 – 42.
2. Igbojinwaekwu, P. C., Kpeke, E. E., & Asuka, T. T. (2007). Academic Achievements of Extroverted and Introverted Students in Senior School Biology. *The Nigerian Academic Forum: A Multidisciplinary Journal*. 13(3), 45-48.
3. Duyilemi, B. O. (2009). To what Extent can Robinson's SQ3R Study Technique Enhance Good Performance of Biology Students: A Seminar Paper proposed on 21st January, 2009, Faculty of Education, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria, in Lecture Hall 1.
4. Ojo, J. A. (2008). Impact of Video CD and Audio Cassette Base Instruction on Secondary School Students Learning Outcome in Selected Environmental Topics in Biology. Unpublished PhD Thesis, University of Ibadan, Nigeria.
5. Igbojinwaekwu, P. C. (2017) Student's Pre-practical Experience and Academic Achievement in Senior School Biology Theory Lesson. *Journal of Resourcefulness and Distinction*, 5(1), 16-23.
6. Stone, R. H., Cozens A. B., Emina, F. I., & Ndu, F. O. C. (1980). *New Biology for West African Schools* London: Longman Group Ltd.
7. Ogenevwede, O.E. (2012). Enhancing the Retention Level of Biology Students through the Guided Discovery Instructional Method. *Nigerian Journal of Curriculum and Instruction*. 19(1), 7-12.
8. Unified Tertiary Matriculation Examination (2018). JAMB Brochure: Syllabus and Regulations.
9. Onyegegbu, N. (2008). Using new technologies in creating excellent in biology laboratory activities. *Educational research and review*. 3(1), 10 -13.
10. Osborne, J., Simon, S., & Collins, S. (2003). Attitudes towards Science: A Review of the Literature and its Implications. *International Journal of Science Education*. 25: 1049-1079. (<http://dx.doi.org/10.1002/sce.2029>).
11. Ndu F. O. C., Okeke, S. O. C., and Igbojinwaekwu, P.C. (2005). Competitive learning environment and academic achievement of girls in senior school science and mathematics. *International Journal of Forum for African Women Educationalists*. 1(3), 151-160