

# LEVEL OF DIFFICULTY OF INTEGRATED SCIENCE CONCEPTS AS PERCEIVED BY JUNIOR SECONDARY SCHOOL STUDENTS IN KWARA STATE

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## ABSTRACTS

*This study investigated the gender differences in difficulty levels of Integrated Science subject concepts at the junior secondary schools in Kwara State. The study gathered data from both male and female Integrated Science students in junior secondary school II and III (JSS 2&3). Data was collected from three hundred and forty-two (342) students (168 male and 174 female) selected from thirty (30) junior secondary schools in Kwara State. Stratified random sampling technique was used to select the schools and participants respectively from the three senatorial districts in Kwara State. A questionnaire is used to generate data on levels of difficulty of concepts in Integrated Science curriculum from students. One hypothesis was generated and tested based on gender of participants. Data collected were analyzed using Chi square. The result reveals that many Integrated Science concepts were perceived difficult to learn by the students in junior secondary schools in Kwara State, Nigeria. Also, there was a significant difference in the perceived levels of difficulty of Integrated Science subject concepts by male and female participants in the study in favour of male Integrated Science students. It was recommended that Integrated Science teachers should encourage the female students to participate actively in class lessons, and also efforts should be made by teachers to simplify the concepts in Integrated Science perceived difficult by students by adopting different teaching strategies/techniques.*

**Keywords:** *Difficult, Level concept, Perceive and Students*

## INTRODUCTION

The technological development of any nation is determined among other things by her scientific and technological advancement, since scientific products are the raw materials used for the production of goods for human comfort and satisfaction. The effort of science and technology has been towards improving the quality of individual and the society at large. Omosewo (2006) defined Science as a body of knowledge, a way of investigating, and a way of thinking in the pursuit of an understanding of nature.

Earlier on, Ivowi (1994) explained that the traditional science subjects such as Chemistry, Physics and Mathematics are abstract in nature and that Biology is taken for granted by many students as an easy subject and consequently they tend to fail woefully. The failures in these science subjects can be attached to various reasons such as unqualified teachers, lack of adequate teaching equipment/materials, teaching methods, students' attitudes and difficulty of concepts in these science subjects.

Dickmeli (2010) stated that various concepts abound in science subjects, most of these concepts are perceived difficult by students due to their cognitive levels, misconceptions, inadequacy in problem solving skills and the learning environment. According to Abimbola (2006), a concept is the meaning that we attach to a given symbol or label, words, formulae and mechanical models as symbols for concepts. More so, there are three types of concept empirical concepts, theoretical concepts and rational concepts. Therefore, for any science teaching and learning, students must pass through science related subjects at the lower level of schooling. Subjects like Integrated Science at the primary and secondary schools exposes students to the other science subjects like Biology, Chemistry, Physics among others.

Many researchers have conducted series of studies on concepts difficulty in sciences. Ahmed, (2009); Baanu, (2010) and Onabanjo, (1999), concluded in their different studies that concept difficulty and misconception is one of the problems affecting performance of students in science subjects. Baanu, (2010) in a study found many chemistry concepts difficult to teach and learn by both teachers and students of chemistry in Kwara and Oyo States of Nigeria. Likewise, Opobiyi (1996) investigated into the difficulty in chemistry concepts and the result shows that many chemistry concepts are difficult to teach by some chemistry teachers in Kwara State. Makanjuaola (2002) study indicates that biology students identified twelve difficult areas in Biology syllabus. Also, Balogun (2000) found out that six important topics in ordinary level Physics curriculum are difficult for students to learn. In the area of Integrated Science, Abdulraheem (2000) analyzed concepts in the Integrated Science curriculum which teachers perceive as difficult to teach and found out that fourteen topics were identified as difficult by teachers.

Also, the influence of gender in the understanding of scientific concepts has been receiving the attention of many scholars all over the world. In particular, the need to address the under-representation of female in science subjects and to identify appropriate methods of improving female instruction, as well as their learning of science seems to have received greater attention. Many research works have established significant gender differences in science in favour of boys, (Olaore, 2003; Adesoji & Babatunde, 2008). This study contributes to knowledge in Science, particularly Integrated Science by investigating the perception of students on the levels of difficulty of concepts taught in integrated science at the junior secondary schools in Kwara State.

### **Statement of the Problem**

Many researchers have conducted studies on difficult concepts in Biology, Chemistry and Physics due to the students' poor performances at the senior school certificate examinations (SSCE). This claim is further substantiated by a report from West African Examinations Council (WAEC) which explains that, "the poor performance of students in science subjects has assumed a dangerous dimension." One of the reasons associated with the persistent failure is misconception and concept difficulty in sciences, (WAEC report, 2006, 2007 and 2008).

In the light of this, science educators have continued to investigate areas of difficulties in science subjects. Integrated Science as a science subject is a basic requirement for most core science subjects like Biology, Chemistry and Physics. It is an integration of other science subjects which serve as a foundation of science to students at junior class. Therefore, the intention of the study is to find out the levels of difficulty of the subject as perceived by students based on gender.

### **Research Questions**

Following research questions were raised for the study:

1. What are the concepts perceived difficult by Integrated Science students at the junior secondary schools in Kwara State?
2. Is there any difference in the perceived level of difficulty of the Integrated Science concepts by male and female students in Kwara State junior secondary schools?

### **Research Hypothesis**

One hypothesis was formulated for the study.

**Ho:** There is no significant difference in the perceived level of difficulty of concepts in Integrated Science by male and female students in Kwara State junior secondary schools.

### **METHODOLOGY**

The study is a descriptive research using survey method. Participants for the study consist of three hundred and forty-two junior secondary school II and III students who were selected using stratified random sampling method from the three Senatorial Districts in Kwara State, Nigeria. The instrument for the study was a researcher-designed questionnaire titled "Level of difficult concepts in Integrated Science subject." Concepts are selected from the Integrated Science curriculum. The questionnaire was scale as difficult (D) and not difficult (ND). The questionnaire was validated by experts in the field of Integrated Science and Sciences from the University of Ilorin, Nigeria.

The researchers sought the permission of the principals of the schools visited, the questionnaire was administered and collected on the same day. The data obtained in the study were statistically analyzed using frequency counts, percentage and chi-square.

### **RESULTS**

The results were presented as follows:

**Research Question 1:** What are the concepts perceived difficult by Integrated Science students at the junior secondary schools in Kwara State?

Using descriptive statistical tools of frequency and percentage, the result shows that thirty-eight (38) Integrated Science concepts were identified by the students as difficult to learn while fourteen (14) of the concepts were rated “not difficult” to learn by junior secondary school Integrated Science students in Kwara State. The identified difficult Integrated Science concepts by the students include, skeletal system, digestive system, nervous system, reproduction system, circulatory system, respiratory system, states of matter and kinetic theory of matter, chemical symbols, formula and equations. Others are energy, ecology, plant and animal cells, man in space whereas characteristics of living things, personal health, refuse and sewage disposal, pollution, vectors, water, rusting, resources from plants and animals, erosion are rated as very easy to learn in Integrated Science.

**Research Question 2:** Is there any difference in the perceived levels of difficulty of the Integrated Science concepts by male and female students in Kwara State junior secondary schools?

Research question 2 has a corresponding hypothesis and was answered through the hypothesis.

**H<sub>0</sub>:** There is no significant difference in the perceived levels of difficulty of concepts in Integrated Science by male and female students in Kwara State junior secondary schools.

**Table 1:** Chi-square analysis of levels of difficulty of Integrated Science as perceived by male and female students

Gender	D	ND	Total	X <sup>2</sup>	df	t-val	Remark
Male	42	126	168				
				7.41	341	5.30	S
Female	107	67	174				
Total	149	193	342				

D ----- Difficult

ND ----- Not Difficult

S ----- Significant

From the table, the calculated  $X^2$  value is 7.41. This is greater than the table value, at significant level of 0.05. This means that the result is significant and the hypothesis is rejected.

## **DISCUSSION**

The study shows high level of difficulty in Integrated Science concepts by students in Kwara State junior secondary schools. The result is in accordance with the findings of Abdulraheem (2000) who analyzed Integrated Science curriculum concepts which teachers perceived difficult to teach and found out that fourteen concepts were difficult for the teachers to teach. If Integrated Science teachers can find these concepts difficult to teach definitely, students will not be able to perform well in these concepts.

Also, the study reveals that there exists a significant difference between male and female Integrated Science students in junior secondary schools in Kwara State. The study is in line with Olaore, (2003) and Adesoji & Babatunde, (2008) who established a significant gender differences in science subjects in favour of boys.

## **CONCLUSION**

From the findings of this study, the level of difficulty in Integrated Science concepts in junior secondary schools in Kwara State is high and this can be one of the causes of the poor performance in science-related subjects at the senior secondary school level. Also, it was revealed that there are differences in the perceived level of difficulty of Integrated Science concepts by male and female students in favour of male students. This means that female students perceive the concepts more difficult than male students.

## **RECOMMENDATIONS**

From the results of the study, it was recommended that:

1. Integrated Science teachers should encourage the female students to actively participate in class discussions.
2. Efforts should be made by teachers to simplify those concepts in integrated science curriculum that are perceived difficult by students so that they can have a strong foundation for selection of science subjects to study at the senior secondary school level.
3. Government should make adequate provisions for relevant materials for teaching and learning integrated science in junior secondary schools.

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