

# SKILLS REQUIRED BY BIOLOGY TEACHERS FOR PLANNING EFFECTIVE TEACHING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN BIU LOCAL GOVERNMENT AREA OF BORNO STATE

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## **Abstract**

This study identified the skills required by biology teachers for planning effective teaching of biology in Senior Secondary Schools in Biu Local Government Area of Borno State. One research question was raised and one hypothesis was formulated and tested at 0.05 level of significance using t-test. Descriptive survey research design was used. The population of the study was 30 biology teachers of Senior Secondary Schools in Biu Local Government Area of Borno State. Reliability coefficient estimate of the questionnaire was 0.88 by Cronbach's Alpha. 30 copies of the questionnaires were administered on the respondents, and 100% were retrieved and analysed. The study revealed that 9 skills were required by biology teachers in planning for effective teaching of biology. The hypotheses revealed that there was no significant difference in the mean ratings of the responses of Male and Female biology teachers on the skills required for effective teaching of biology. Significant difference was found in the mean ratings of responses of male and female Biology teachers in one skill item in planning.

**Key Words:** Skills, Planning, Biology Teacher, Effective Teaching

Teaching is a process of imparting knowledge, formally or informally. In other words it refers to actions that are systematically planned or unplanned but facilitates learning, such as motivation, presentation and social milieu that could lead to permanent change in behaviour. According to Alberta Teachers' Association (2017) teaching is the specialised application of knowledge, skills and attributes designed or planned to meet the educational needs of the individual and of society. They also emphasised the choice of learning activities whereby the goals of education are realised. Since teaching is the transferring of knowledge and nurturing individuals thought into reality, then teaching requires systematic skills in planning for teaching to be effective.

According to Kyriacou (2009) effective teaching can be defined as teaching that successfully achieves the learning by students intended by the teacher. In essence, the teacher must have a clear idea of what learning is to foster. In addition Robert, Cesare, Steve and Lee (2014) defined effective teaching as that which leads to improved students achievement using outcomes that matter to their future success. Effective teaching involves planning, organizing, implementing, and evaluation of students' achievement. In order to achieve this it requires a skilled and competent teacher. Anderson (2001) also buttressed this position that one of the key characteristics of effective teaching includes knowledge of basic principles and procedures. As a teacher bestowed with the responsibility of helping others to acquire knowledge, skills, attitudes and values, skills are therefore required by biology teachers for planning effective teaching.

A biology teacher, is typically referred to as a science teacher who is highly skilled in science specifically Biology. According to Karynne (2017) biology teachers work independently and with

others to select the material to be taught and apply effective teaching methods for conveying that material to learners and evaluate students' knowledge of the subject. Therefore, professional skills are required by biology teachers for effective teaching of biology to students through planning, implementing, and evaluation.

Osuala (2004) sees skill as an ability to put into use acquired competencies, attitudes and behaviour after an exposure to theories and practices inherent in a field of study. Ogwo and Oranu (2006) noted that, when skills are carefully developed and fully learned they become fixed manual habit. According to Okorie (2000), skill is the habit of acting, thinking and behaving in a specific activity in such a way that the process becomes natural to the individual through practice. Therefore, Effective teaching is the capability of producing a desired result or to produce the expected outcome of the teaching. It is therefore, necessary to find out the skills required by biology teachers for planning effective teaching in Senior Secondary Schools in Biu Local Government Area of Borno State.

### **Statement of the Problem**

It was observed by the researcher that the performance of secondary school students in biology is below expectation. This poor performance could be as a result of many factors such as teacher factors, students' factors, environmental factors and inadequate laboratory facilities. It is against this background that this study investigated the skills required by biology teachers for planning effective teaching of biology in Senior Secondary Schools in Biu Local Government Area of Borno State.

### **Purpose of the Study**

This study investigated the skills required by biology teachers for planning effective teaching of biology in senior secondary schools in Biu Local Government Area of Borno State. One research question guided the study:

1. What are the skills required by Biology teachers in planning for effective teaching of biology in Senior Secondary Schools in Biu Local Government Area of Borno State?

### **Hypothesis**

One hypothesis was developed and tested:

**H<sub>0</sub>**: There is no significant difference in the mean ratings of the responses of male and female Biology teachers on the skills required in planning for effective teaching of Biology in Senior Secondary Schools.

### **Methodology**

Descriptive survey research design was used in the study. This design was appropriate for the study since it used questionnaire for collecting data.

### **Population**

The population of the study was thirty biology teachers comprised of sixteen (16) Female Biology teachers and fourteen (14) Male Biology teachers in 10 Senior Secondary Schools in Biu Local Government Area, of Borno State where biology is taught. No sample was taken, as the population was small and manageable.

### **Instrumentation**

The instrument for data collection was a structured questionnaire consisting of 10 items developed by the researchers from the literature reviewed. The respondents will respond based on the following responses: Highly Required (HR);Averagely Required (AR);Slightly Required (SR); Not Required (NR).The instrument was subjected to face validation by three experts. A reliability coefficient of 0.88 was obtained by Cronbach’s Alpha.

### **Data Collection**

The instrument was administered on the respondents by the researcher and all the 30 copies of the administered questionnaires were retrieved making it 100% retrieval and used for data analysis.

### **Data Analysis**

Mean and standard deviations were used to answer the research questions posed for the study. The real limit of numbers was used to take a decision on the skill items.

Responses options of real limit are as follows:

- HR =3.50 -4.00
- AR=2.50-3.49
- SR=1.50-2.49
- NR= less than 1.50

Any item whose mean is 1.50 and above, was regarded as required while any item whose mean is less than 1.50 was regarded as not required. t-test statistics was used in testing one null hypotheses formulated at 0.05 level of significance. Any item with a standard deviation between 0.00 and 1.96 indicated that the respondents were not far from the means and the opinions of one another while any item whose standard deviation is greater than 1.96 means that the respondents were far from the means and one another in their responses or opinions.

### **Results**

The results of the study were discussed under two sections: Answering research question and testing hypothesis.

**Table 1**

**The Mean Scores of the Responses of Biology Teachers on the Skills required by Biology Teachers in Planning for Effective Teaching of Biology in Senior Secondary Schools**

<b>N = 30</b>					
N	S/	ITEM STATEMENT	—	X D	DECISION
1.		Develop a scheme of work for Biology teaching.		3	R
			.36	85	
2.		Determine students’ need and interests in planning a		3	R
	lesson.		.23	74	
3.		Simplify the instructional content before teaching.		3	R
			.25	88	
4.		Identify general goals of curriculum in Biology.		2	R
			.65	.15	
5.		Develop instructional objectives in a sequential		1	NR
	manner.		.25	83	

6.	Plan a unit that takes into account the students prior knowledge	.99	2	90	R
7.	Plan a variety of teaching strategies.	.19	2	86	R
8.	Plan for instructional materials to be used.	.35	2	87	R
9.	Plan classroom activities and assignment.	.24	2	75	R
10.	Determine appropriate evaluation techniques to be used.	.29	2	88	R

**Key:**  $\bar{x}$  = Mean, S = Standard Deviation, R =Required, NR = Not Required

Table 1 revealed that nine (9) skill items in planning had their means range from 2.19 to 3.36. Each of these means is higher than 1.50 indicating that all the nine (9) skill items were required by Biology teachers for planning effective teaching of Biology in Senior Secondary Schools in Biu Local Government Area of Borno State.

However, one (1) skill item had its mean in planning for effective teaching to be 1.25 which is less than 1.50 indicating that the skill item is not required in planning for effective teaching of biology by Biology teachers in Biu Local Government Area of Borno State. The standard deviation for the ten (10) skill items ranged from 0.74 to 1.15 which was low indicating that the respondents were not far from the mean and from one another in their responses.

#### **Testing Hypothesis**

**H<sub>0</sub>1:** There are no significant differences in mean ratings of the responses of Male and Female Biology teachers on the skills required in planning for effective teaching of Biology in Senior Secondary Schools.

**Table 2**

**t-test Analysis of the Mean Ratings of the Responses of Male and Female Biology Teachers in Planning for Effective Teaching of Biology in Senior Secondary Schools in Biu Local Government Area of Borno State**

$N_1 = 14, N_2 = 16 = 30$

S/N	ITEM STATEMENT	Male Teachers $\bar{x}_M$	Biology $SD_1^2$	Female Teachers $\bar{x}_F$	Biology $SD_1^2$	P Value	Remarks
1.	Develop a scheme of work for Biology teaching.	28.17	.85	3.35	.87	0.05	NS
2.	Determine students' needs and interest in planning a lesson.	2.36	.74	3.28	.74	0.17	NS
3.	Simplify the instructional content before teaching.	3.23	.88	3.25	.87	0.12	NS
4.	Identify general goals of curriculum content.	2.25	1.15	2.59	1.12	0.001	S
5.	Develop instructional objectives in a sequential manner.	2.65	.83	3.28	.70	0.05	NS
6.	Plan a unit that take in to account the students' prior knowledge.	3.25	.90	3.10	.77	0.15	NS
7.	Plan a variety of teaching strategies.	2.99	.86	3.10	.77	0.15	NS
8.	Plan instructional materials to be used.	3.19	.87	3.36	.88	0.05	NS
9.	Plan for classroom activities and assignment.	3.35	.75	3.23	.74	0.17	NS
10.	Determine appropriate evaluation techniques to be used.	3.24	.88	3.25	.88	0.12	NS

**Key:**

- N = Number of Respondents
- X M = Mean of male Biology Teachers
- X F = Mean of female Biology teachers
- S = Significant
- NS = Not Significant

Table 2 revealed that nine (9) skills items in planning for effective teaching had their P- value range from 0.05 to 0.17. The items are 1, 2, 3, 5, 6, 7, 8, 9 and 10. Each of the P- value is equal to or greater than 0.05 level of significant indicating that there was no significant differences in the mean ratings of the responses of male and Female Biology teachers on the skills required in planning for effective teaching of biology. Therefore, the hypothesis of no significant difference was accepted for the nine (9) skill items. However, skill item No 4 has a P- value of 0.001 indicating that there was significant difference in the mean ratings of the responses of Male and Female Biology teachers on the skills required in planning for effective teaching of biology in Senior Secondary Schools. Therefore, the hypothesis of no significant difference was rejected for item No 4.

**Discussion**

The study found that nine (9) skill items which comprises developing scheme of work for Biology teaching, determine students' needs and interests in planning a lesson, simplify the

instructional content before teaching, identify general goals of curriculum in Biology, plan a unit that takes into account of the students' prior knowledge, plan a variety of teaching strategies, plan instructional materials to be used, plan class room activities and assignment, and determine appropriate evaluation techniques to be used

are required by Biology teachers in planning for effective teaching of Biology in Senior Secondary Schools, while, one (1) skill item is not required in planning for effective teaching of biology. Therefore, the findings of this study are in agreement with Olaitan (2003) who identified the necessary steps in planning for effective teaching which includes identifying the course objectives or intended learning outcomes, selection of relevant teaching methods, identifying key concepts in the course and identifying appropriate evaluation techniques among others.

The study also revealed that there was no significant difference in the mean ratings of the responses of male and female biology teachers on the skills required by biology teachers for planning effective teaching of biology in Senior Secondary Schools in Biu Local Government Area of Borno State, however, significant difference was found in one item.

### **Conclusion**

Based on the findings of the study conclusions that could enhance effective teaching of biology were made; biology teachers require nine (9) skill items in planning for effective teaching of biology in Senior Secondary Schools in Biu Local Government Area of Borno State. Male and female teachers require the same skills for planning effective teaching of biology in Senior Secondary Schools.

### **Recommendations**

Borno State Ministry of Education should organise workshop to sensitise teachers on skills required for planning effective teaching of biology in order to enhance their teaching abilities that could lead to improvement in students understanding and performance. School principals should also organise such workshops locally.

### **References**

- Alberta Teachers' Association (2017) Nature of teaching and teaching as a profession <https://www.teachers.ab.ca/> Retrieved on 9<sup>th</sup> September, 2017
- Anderson, L.W.& Krathwol D.R. (2001) *A taxonomy for Learning, Teaching and Assessing. A revision of bloom and taxonomy of educational objectives* New York: Longman
- Karynne, L.M. (2017) "High School Biology Teacher" Biology Retrieved Jul 22, 2017 from Encyclopedia.com <http://www.encyclopedia.com>
- Kyriacou, C. (2009), *Effective Teaching in School: Theory and practice*; Nelson Thornes Publishers
- Ogwo, B.A. & Oranu, R.N. (2006). *Methodology in Formal and Non-formal Technical/Vocational Education*. Enugu: Ijeja Publishing Company.

- Okorie, J. U. (2000) *Developing Nigerians workforce* Calabar.Menkey. Environs publisher
- Olaitan, S. O. (2003) *Understanding Curriculum*. Nsukka Ndudim Printing and Publishing Company.
- Osuala, E.C. (2004) *Foundation of Vocational Education* Enugu.Cheston Agency Ltd.  
<http://www.teacher.org/career/biology-teacher/> Retrieved on 9<sup>th</sup> September, 2017
- Robert C.A., Steve H. & Lee, F. M. (2014) *What makes a great teaching*. Review underpinning Research C. E. M., Durham University.