



## Perceived Effectiveness of Teaching and Learning of Biology by Teachers and Students of Some Senior Secondary Schools in Katsina State

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### ABSTRACT

The study sets four objectives, four research questions and four hypotheses were formulated. The study used a descriptive survey research design. The population of the study in this context comprises all the teachers and students in Kafur Local Government Area, Katsina State with a population of 21,538 teachers and students, from which 377 (that constitutes students 345 and teachers 32) were sample. The instrument that was used to collect the data for this research was a structured questionnaire. The data obtained were analyzed using mean, standard deviation and t-test using Statistical Packages for Social Sciences. Findings from the study accept that there is no significant difference between the perception of students and teachers on the problem of effective teaching and learning of Biology in senior secondary school with a p-value of 0.1926 and t value of 1.3052, also, the study shows that there is no significant difference between perceptions of students and teachers on the factors that affect teachers on teaching and learning of biology in senior secondary schools with a p-value of 0.4231 and t value of -0.802. It was recommended that Biology teachers should adopt effective teaching strategies to enhance students' understanding, Government should encourage teachers by paying, incentives, scholarships to read further and organising periodic training programmes like workshops, seminars etc. learning environment should be conducive and enriching with resources to raise students' interest to learn actively to make them competent in preparing the 21st-century students to face global contest in their chosen fields. This study concludes that teachers' and students' perception of effective teaching and learning in biology is not statistically significant.

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### INTRODUCTION

The term science has to do with nature; it is derived from the Latin word *scientia* which means knowledge. It is a systematic enterprise that builds and organizes knowledge in the form of testable explanation and predictions about the universe. It can equally be defined as the field of study which tries to describe and understand the nature of the universe in whole or part (Abinomla, 2011). According to Hyacinth (2014) science in

its broadest scene refers to all human activities involving organized knowledge of natural phenomena. It also refers to a system of acquiring knowledge here system uses observation and experimentation to describe and explain natural phenomena. Science is a great enterprise which nations depend on, in-order to advance technologically.

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technologically. Science therefore, is receiving much emphasis in education because of its significance and relevance to life and society. Biology as a branch of science and the prerequisite subject for many fields of learning contributes immensely to the technological growth of the nation. This includes medicine, forestry, agriculture, biotechnology and nursing. The study of Biology in senior secondary school can equip students with useful concepts, principles and theories that will enable them face the challenges before and after graduation (Ahmed, 2014).

Biology as one of the science subject is bent in making one to be conversation with the environment he/she lives in appreciate the meaning of scientific life, to develop unbiased mind and to be intellectually homes with serve as ideal to the future citizen. Fortunately, it is a fact that Biology is the commonly chosen science subject of most secondary pupils are confirmed by the West Africa Examination council (WAEC) record. The term biology is derived from two Greek words "bios" and "logos" which mean life and study respectively. Biology therefore means the study of life or study of living things (Zeidan, 2014).

According to Stone *et al* (2015), biology as a science is defined as a scientific study of living organisms. It is therefore a natural science concerned with the study of life and living organisms, including their structure, function, growth, origin, evolution and taxonomy. It have several branches; including the two big branches of biology which are botany (the study of plants) and zoology (the study of animals), morphology (the study if external structure of living things) physiology (the study of how living things function), Ecology (the study of relationship between living things and their environments), Genetics (the study of how living things inherits characters from their parents) Cell biology (the study of cell structure and functions).

Biology often overlaps with other sciences, for example biochemistry with biology and chemistry, Astrobiology with biology and astronomy. Social science such as geography, philosophy, psychology and sociology can also interact with biology, for example in

administration of biological resources, developmental biology etc. it is a vast subject containing many subdivisions topics which are five unifying principle that can be said to be fundamental of modern biology (Aziz,2009).

Ahmed, (2013) point out that, effective teaching of biology is a process by which a biology teacher adopt all the possible method used in teaching in the classroom to make sure that students understand biology and be able to respond positively during assessment or to produce a good result. Teachers' effectiveness is exhibited in the teaching method, classroom managements, the material as well as the way students are being handled, a good teacher always bear in mind the individual differences of the students while presenting the lesson and frequently check the student's understanding of his or her points to make sure that they are getting of understanding his lesson. This also includes the ability of the teacher to answer question asked by the students, having knowledge about his or her subject matter and ability to show students how to conduct appropriate research.

Biology is one of the core science subjects, which is supposed to be the most interesting subject to students in senior secondary schools. But the rate at which students fails biology in results (WAEC and NECO) shows that effective learning has not been attained by these students. Aganga (2000) observed that "many secondary schools, especially the public schools have insufficient competent teachers as well as biological equipment in their respective schools". Unqualified biology teacher, inappropriate training background of science teachers especially biology teachers and qualification of biology teachers are the major factor that militate against effective teaching of biology because some biology teachers in some senior secondary school did not undergo enough training to enable them get skills, qualities and enough knowledge of the subject matter and how to impact the knowledge to the students. Poor method of teaching biology in senior secondary school.(Cimer, 2015).Another problems is the inadequate supply of biology equipment,in some



schools, many laboratories equipment's like microscope, glass tube, Beaker, slide, Bones of vertebrates etc. charts of different animals development, systems, organs, etc, work book for practical and textbooks are not adequate for the students in learning of biology. Therefore, the paper sought to investigate on perception of teachers and students problem affecting teaching and learning of biology in senior secondary school in Kafur Local Government Area, Katsina State

### Objectives of the Study

- To determine the perceptions of teachers and students on the problem of effective teaching and learning of Biology in senior secondary school in Kafur LGA.
- To discuss on the factors that affects teachers and students on teaching and learning of biology in senior secondary schools in Kafur LGA.

### Research Questions

- What are the perceptions of teachers and students on the problem of effective teaching and learning of Biology in senior secondary school in Kafur LGA?
- What are the factors that affect teachers and students on teaching and learning of biology in senior secondary schools in Kafur LGA?

### Null Hypotheses

- H<sub>01</sub> There is no significant difference between perceptions of teachers and students in teaching and learning of Biology in senior secondary school in Kafur LGA.
- H<sub>02</sub> There is no significant difference between factors affecting teachers and students on teaching and learning of biology in senior secondary schools in Kafur LGA.

### MATERIALS AND METHOD

The study was descriptive survey design. Descriptive survey is a method of collecting information by administering a questionnaire to a sample of individuals.

Population in this context covers mainly the total population of the respondents. The research population covers all Secondary School, Katsina State. The population of this study comprises of twenty one thousand five hundred and thirty eight (21,538) students in Kafur LGA.

This paper used systematic probability sampling method was used to select five (5) secondary schools in Kafur LGA based on the quality of information they have on the subject of investigation since it will be quite difficult to cover the entire population of the study area. In determining the sample size of the population for this study, krejcie and Morgan model of determining sample size was used we arrived at 377 respondents will be selected from the five selected schools shown below:

**Table 1:** Sample Distribution of the Study

S/N	Schools	Students Sample
1.	G.G.D.S.S Kafur	75
2.	G.P.D.S.S. Kafur	81
3.	G.D.S.S. YariBori	66
4.	G.D.S.S. SabuwarKasa	101
5.	G.D.S.S. Gozaki	53
	<b>Total</b>	<b>377</b>

A structured designed questionnaire was used to guide the study in order to collect data that were used for the data analysis. The analysis of data collection was gathered in a tabular form, at the end the interpretation of data to get the percentage of respondents. The method used in

analyzing the data in this paper was Statistical Package for Social Sciences (SPSS) and t-test comparison of results means were used to test the null hypothesis.

### RESULTS



Frequency, Mean and standard deviation were used for descriptive analysis and t-test were used for inferential analysis. All the analysis for inferences were done based on alpha ( $\alpha$ ) value of 0.05. Findings of the study are presented in the table below:

**Research Question One:** What are the perceptions of students and teachers on the problem of affecting teaching and learning of Biology in senior secondary school in Kafur LGA?

**Table 2:** Analysis of perceptions of students and teachers on the problem of affecting teaching and learning of Biology in senior secondary school in Kafur LGA

Statement	Students						Teachers					
	SD	D	A	SA	Mean	Std.	SD	D	A	SA	Mean	Std.
Most biology teachers do not relate topics in Biology to a real life situations when teaching their students	18	38	59	220	3.3652	.97047	2	1	6	23	3.5625	.84003
Most teachers do not entertain questions from students because they do not have cordial relationship with their students	28	7	81	219	3.4232	.91215	2	0	6	24	3.6250	.79312
There are insufficient Biology teachers in schools both in number and quality	47	37	58	203	3.2087	1.09568	3	0	6	23	3.5312	.91526
Poor teaching methods are used by most Biology teachers	35	27	61	222	3.3623	.99958	3		6	23	3.5312	.91526
Teachers do not plan adequately for the Biology classes as a result of much work load in senior secondary schools	25	18	34	268	3.5797	.88603	1	1	2	28	3.7812	.65915
<b>Average Responses Mean</b>	31	25	59	226	3.39	0.97	2	1	5	24	3.61	0.82

From above Table 2, it revealed that the teachers do not relate topics in Biology to real life situations when teaching their students with mean rate of 3.3652. If the teachers do not entertain questions from students because they do not have cordial relationship with their students with mean rate of 3.4232. There is an insufficient Biology teacher in schools both in number and quality with mean rate of 3.2087. Poor teaching methods used by teachers with mean rate of 3.3623. if teachers do not plan

adequately for the Biology classes as a result of much work load in senior secondary schools with mean rate of 3.5797.

Also from the teacher's site, most of them agreed that some do not relate topics in Biology to a real life situation when teaching their students with mean rate of 3.5625 and it affects students' performance. Some teachers do not entertain questions from students because they do not have cordial relationship with their students with mean rate of 3.6250. There are

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insufficient Biology teachers in schools both in number and quality with mean rate of 3.5312. Lack of appropriate teaching methods with mean rate of 3.5312. if teachers do not plan adequately for the Biology classes as a result of much work load in senior secondary schools with mean rate of 3.7812

**Research Question Two:** What are the factors that affects teachers and students on teaching and learning of biology in senior secondary schools in Kafur LGA?

**Table 3:** Analysis of factors that affects teachers and students on teaching and learning of biology in senior secondary schools in Kafur LGA

Statement	Students						Teachers					
	SD	D	A	SA	Mean	Std.	SD	D	A	SA	Mean	Std.
There is sufficient period on my school's time-table for the teaching of Biology	11	6	55	273	3.710	.6582	0	1	8	23	3.656	.6530
Effective teaching and learning of Biology will be hindered if teachers are not motivated to teach the subject	3	12	115	215	3.594	.5589	1	0	17	14	3.406	.5599
The population of students in my class enhances teacher-student perception on Biology	12	2	115	261	3.595	.5585	0	1	17	14	3.406	.5599
My school's environment is well managed and conducive	12	2	115	261	3.595	.5585	0	1	17	14	3.406	.5599
The Biology syllabus has explicit details related to objectives, content and methodology in Biology	3	25	133	184	3.458	.6424	1	2	12	17	3.500	.568
<b>ARP</b>	<b>8</b>	<b>9</b>	<b>107</b>	<b>239</b>	<b>3.59</b>	<b>0.60</b>	<b>0</b>	<b>1</b>	<b>14</b>	<b>16</b>	<b>3.47</b>	<b>0.58</b>

As shown in Table 4, among the perceived factors that affects teachers and students on teaching and learning of biology in senior secondary school in Kafur LGA includes insufficient period on my school's time-table for the teaching of Biology with mean rate of 3.710. Effective teaching and learning of Biology will be hindered if teachers are not motivated to teach the subject with mean rate of 3.593. Also the population of students with mean rate of 3.5948. Unconducive school's environment with mean

rate of 3.5948. if the Biology syllabus has not explicitly details related to objectives, content and methodology in Biology with mean rate of 3.4577

**Test of Hypotheses**

**Hypothesis One:** There is no significance difference between perceptions of students and teachers on the problem of effective teaching and learning of Biology in senior secondary school in Kafur LGA?

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**Table 4:** T-test analysis of significance difference between perceptions of students and teachers on the problem of effective teaching and learning of Biology in senior secondary school in Kafur LGA

Group	N	Mean	Std.	Mean diff.	df	T <sub>cal</sub>	P value	Remark
Students	345	3.39	0.97					
Teachers	32	3.61	0.82	0.22	375	.1.3052	0.1926	Not significant

Table 4, revealed the t-test analysis of significant difference between perceptions of students and teachers on the problem of effective teaching and learning of Biology in senior secondary school in Kafur LGA. The t-value shows 95% confidence interval is 1.64. Since the p value is 0.1926. This implies that the value is greater than p value of 0.05. Hence the students-teacher perception are the same. The study accept that there is no significance

difference between perceptions of students and teachers on the problem of effective teaching and learning of Biology in senior secondary school in Kafur LGA

**Hypothesis Two:** There is no significance difference between students and teachers on the problems militating against effective teaching and learning of Biology in senior secondary school in Kafur LGA

**Table 6:** T-test analysis of significance difference between students and teachers on the problems militating against effective teaching and learning of Biology in senior secondary school in Kafur LGA

Group	N	Mean	Std.	Mean diff.	Df	T <sub>cal</sub>	P value	Remark
Students	345	3.59	0.60					
Teachers	32	3.47	0.58	0.12	375	1.0852	0.279	Not significant

The t-value shows 95% confidence interval is 1.64. Since the p value is 0.270. This implies that the value is greater than p value of 0.05. Hence the students-teacher perceptions are the same. The study accept that there is no significance difference between students and teachers on the problems militating against effective teaching and learning of Biology in senior secondary school in the area.

that the majority of teachers have inadequate perceptions of scientific creativity and this may influence their classroom practices. The study accept that there is no significance difference between perceptions of students and teachers on the factors that affects teachers on teaching and learning of biology in senior secondary schools in the area with mean difference -0.08, p value of 0.4231 and t value of -0.802

### DISCUSSION OF THE FINDINGS

The study finds out that there is no significance difference between perceptions of students and teachers on the problem of effective teaching and learning of Biology in senior secondary school in the area. The study of Grace *et al* (2015) findings show that a high percentage of the biology teachers have correct perceptions of general creativity but only a small percentage have the correct perceptions of scientific creativity. The findings have also yielded valuable information that informs curriculum developers, teacher trainers and policy makers

The study accept that there is no significance difference between students and teachers on the problems militating against effective teaching and learning of Biology in senior secondary school in the area. The findings of Idoko (2010) who observed among others that lack of qualified mathematics teacher, lack of instructional materials and insufficient lesson period are the major factor militating against effective teaching and learning of mathematics in the area. The study accept that there is no significance difference between students and teachers on the solutions to the Problems Militating against the perception of teachers on

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the effective teaching and learning of Biology in senior secondary school in the area. Urama (2011) found that among factors militating against effective teaching and learning of chemistry in secondary school in the area. Urama (2011) study revealed that bad teaching method, lack of instructional material, attitude of students towards chemistry and inadequate fund and others constitute the major factors hindering effective teaching and learning of chemistry. Bad teaching methods are among the factors militating against effective teaching and learning in biology.

### CONCLUSION

From the results, the findings reveals that there is no significance difference between perception of students and teachers on the problem of effective teaching and learning of Biology in senior secondary school in the area. The findings also shows that there is a high percentage of the biology teachers who have correct perception of general creativity but only a small percentage have the correct perception of scientific creativity. The findings have also accept that there is no significance difference between perception of students and teachers on the factors that affects teachers on teaching and learning of biology in senior secondary schools with mean difference of -0.08, p value of 0.4231 and t value of -0.802. The study also concluded that there is no significance difference between students and teachers on the problems militating against effective teaching and learning of Biology in senior secondary school.

### RECOMMENDATIONS

Based on the above research work the following recommendations are therefore made:

- a. Biology teachers should adopt effective teaching strategies to enhance students' understanding
- b. There is need to teach biology dynamically, not as a static subject in textbooks, emphasizing inquiry instruction that would

allow students to pursue areas of personal interest.

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