



Quality, Experience And Workload As Correlates Of Senior Secondary School Biology Teachers' Teaching Effectiveness In Yobe State, Nigeria

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ABSTRACT

The purpose of this study was to investigate the teachers' quality, experience and workload as correlates of senior secondary schools biology teachers' teaching effectiveness in Yobe state, Nigeria. Four research questions and four hypotheses were used in the study. The study adopted a descriptive survey research design of correlational type. A sample of 420 respondents which consists of 48 biology teachers and 372 senior secondary school two (SSII) biology students were randomly selected from the three education zones of Yobe state using stratified random sampling technique, while questionnaire containing seven items each on teachers' quality, experience, workload and teaching effectiveness were used for data collection. Frequency count Mean and Standard Deviation were used for data analysis, while Pearson Product Moment Correlation Coefficient and multiple analyses were used for the null hypotheses. The reliability coefficient of the instrument was obtained to be 0.87 using Cronbach Alpha. Findings revealed that significant relationships existed among the independent variables and their teaching effectiveness in biology, $r=.947$, $n= 420$, $p<0.05$, $r= .975$, $n= 420$, $p<0.05$ and $r= .989$, $n= 420$, $p<0.05$. Teachers' quality, experience and workload explained 98.2% contributor the prediction of the variance in teaching effectiveness. Teachers' quality, experience, workload and teaching effectiveness were found to have strong positive relationship, which indicated by r value = .991. It was recommended that constant workshops and seminars should be made available by government for teachers to attend for the improvement of their teaching skills to be effective teachers in the field of teaching biology in senior secondary schools in Yobe state.

Keywords: Teaching Effectiveness, Quality, Qualification, Experience, Workload

INTRODUCTION

Looking at the importance of biology to the national development and considering the state of poor learning of students at the secondary level, teacher's quality, experience, workload and teaching effectiveness becomes very important variables to ponder upon. The poor learning observed among biology students should be a thing of serious concern to any citizen of Nigeria. The teachers' qualifications, teachers' workload in terms of number of students handled by teachers and experience possessed by teachers teaching biology as a subject to the students could be responsible in part for the downward trend in teaching effectiveness as observed in the students' performance in the subject.

Akuma (2005) found out that there is lack of facilities in biology laboratories and libraries are ill-equipped, teaching is mostly uninteresting due to the use of lecture method which is less activity oriented in lessons. Okoye (2006) found out that most students displayed general negative attitudes to the study of biology such that some copy notes of other subjects during biology classes due to unfriendly and strict classroom interaction of biology teachers.

Biology as a school subject and a science of life is full of technical terms and concepts, some of which may not be easy for students to understand unless an effective biology teacher explains the term clearly (Ramalingam, 2000). When the explanation of the technical terms is correctly done, communication barrier in teaching – learning process reduces in the classroom (Lee, 2000; Ugwuadu

& Obi, 2009). Literature revealed that performance of students in West African Senior School Certificate Examination (WASSCE) and Senior School Certificate Examination (SSCE) are persistently poor (WAEC Chief Examiners' Report, 2013, 2014, 2015 & 2016). The technical terms and concepts are those areas of biology teaching that can be used to rate the effectiveness of a practicing biology teacher. The quality of the education system depends on the quality of teachers and a school without the necessary resources will make it impossible to achieve the goals and objectives of the educational system (Olaleye, 2011). Usman (2003) argued that, shortage of qualified teachers is responsible for the poor students' learning observable among the students while Ademulegun (2001) argued that students taught by more qualified and experienced teachers in terms of knowledge of the subject matter perform better than those taught by less qualified but experienced teachers.

Also, the qualities of teachers determine their efficiency level. It is necessary for any school to have enough qualified teachers. Thus, it is not the number that matters but the level of their quality. The National Policy on Education (FRN, 2004) recommended a minimum of Nigerian Certificate in Education (NCE) for appointment as a teacher in primary and junior secondary schools in Nigeria. The educational analysis carried out in Nigeria by National Economic Empowerment and Development Strategy (NEEDS, 2005) indicated that about 49% of the teachers in Nigeria are unqualified and ineffective. This revealed that the quality of teachers teaching various school subjects in secondary school include those teaching biology as a subject in various secondary schools are probably among the said 49% unqualified teachers.

In many countries, teachers' qualifications that are considered to be related to student learning have become desirable targets of teacher education reform. Some of these reforms call for the professionalization of teacher education by making it longer, upgrading it to graduate programs, and regulating it through mechanisms of licensure, certification, and promotion to align with standards (Thorenson, Darling-Hammond, Chung & Frelow 2002). Professional development activities can be conducted by many different organizations, in schools and out of school, on the job or on sabbatical leave. On these occasions, practicing teachers update their content knowledge and teaching skills to adjust to the introduction of new curricula, new research findings on teaching and learning, changes in the needs of students, population etc. Studies by Wenglinsky (2000) found a positive effect of professional development on students' achievement.

In his contribution, Brown (2001) pointed attention to the quality of biology teachers as the prime factor attributed to the cause of students' consistent poor achievement in examinations. Teachers' effectiveness in a subject may be prime determinant of students' performance in the subject. Ineffective teaching in secondary schools arises probably from the quality of teachers recruited to teach science. In many secondary schools, science subjects are taught by people who are not interested and unqualified in teaching the subject. For instance, undesirable situations showed engineers teaching mathematics and physics, biochemists teaching chemistry and microbiologists teaching biology. In this kind of situation, students who undertake science and mathematics at school may either end up disillusioned or greatly hampered in the development of the mental discipline which acquisition of scientific knowledge demands. Secondary school sciences teachers need to be professionally qualified to enable them work effectively with pupils in stimulating and directing their growth in desired directions.

Teaching qualification is one thing, while experience is another with regard to teachers' teaching effectiveness in school subjects. Here, the experience of a teacher is judged based on the number of years of service. It is believed that the more the years spent in service in a particular discipline such as teaching the more you gain experience and become more knowledgeable in all it takes to enhance productivity or achievement of students in there. When teachers have not spent many years in the teaching field, it is likely that their effectiveness in academic work service delivery in the classroom may be adversely affected, and by extension the academic achievement of students probably may be similarly affected.

Imhanlahimi and Aguele (2006) opined that the professional background and commitment of the science teacher determines to some extent the quality of performance of students in examinations. Teacher's teaching experience is another teacher quality indicator considered in this study and it is defined as the number of years a teacher has spent in the teaching service. (Adewale, 2010) found that years of experience has a strong correlation with improved students' achievement. It is argued that prospective and experienced teachers' knowledge and beliefs serve as a filter through which their

teaching take place (Borko, 1996). A study conducted by (Martin, Mullis, Gregory, Hoyle & Shen, 2000) showed that level of experience has a significant influence on teaching effectiveness of the teachers and their students' achievement. Similarly, (Aiken, 1991) found that teaching experience of teachers is significantly related to their teaching effectiveness and their students' achievement. The findings of (Martin, Mullis, Gregory, Hoyle & Shen, 2000) also showed a positive relationship between teacher experience and students' outcomes.

Statement of the Problem

Education scholars have pointed out that education quality is the reflection essence. There would be no good education without good teacher quality, for teaching effectiveness is the core mission of schools (Wang & fuw, 2007). Therefore, there is need to get a deeper understanding of the classroom instructional level quality of secondary school biology teachers in terms of qualification, experience, workload and teaching methodology in order to ensure quality of education given to our youths and how they differ in affecting teaching effectiveness.

Ozordi (2010), reflecting on the state of education in the country lamented that the present day secondary students on the average, can no longer do what primary school pupils used to do in those days academic wise. This may partly attributed to ineffectiveness to teachers among other factors. It is necessary to probe into teachers' quality to help teachers ascertain their shortcomings so that they can not only improve themselves but also increase their teaching effectiveness.

This seems to be corroborated by West African Examination Council (2009) report on biology, most especially. The professional qualifications required of any teacher in Nigeria are NCE, BSC (Ed) or B. Ed or PGDE in cases where teachers are not professionally qualified Poor teacher quality decreases effectiveness in teaching. On a general note, teachers without educational background have been found ineffective teacher in terms of instructional delivery competence. A common observation of the school system will show a large number of young teachers teaching biology with few years of experience. Many of these teachers seem to lack the much needed experience that could bring about effective teaching and learning in terms of methodology.

Workload issue about instruction is another continuing problem for teachers teaching biology in secondary schools. Biology teachers have little time to collaborate or involve in instructional decisions. Teachers do not attend to students as required due to heavy workload on their parts. The number of periods he or she spends in the classroom and other related activities; it equally includes the ratio of students per teachers, the number of classes taught and non-classroom responsibilities.

Hence, the need to look into teachers' quality, their experiences and workloads in our secondary schools, because effective teaching elicits effective learning. Therefore, this study is designed to survey the teachers' quality, experience, and workload and biology teachers' teaching effectiveness in Yobe state.

Purpose of the Study

The purpose of the study is to investigate the relationship between quality, experience, workload and biology teachers' teaching effectiveness in senior secondary schools in Yobe state, Nigeria. Specifically, the study seeks to:

1. Find out the relationship between the quality of biology teachers and their teaching effectiveness in Senior Secondary Schools in Yobe State.
2. Determine the relationship between the experience of biology teachers and their teaching effectiveness in Senior Secondary Schools in Yobe State.
3. Examine the relationship between the average workload of biology teachers and their teaching effectiveness in Senior Secondary Schools in Yobe State.
4. Investigate the relationship among teachers' quality, experience, workload and their teaching effectiveness in Senior Secondary Schools in Yobe State.

Research Questions

The following research questions were generated to guide the study.

1. What is the extent of quality of biology teachers in Senior Secondary Schools in Yobe State?
2. What is the extent of biology teachers experience in Senior Secondary Schools in Yobe State?
3. What is the average workload of biology teachers in Senior Secondary Schools in Yobe State?
4. What is the extent of biology teacher's effectiveness in Senior Secondary Schools in Yobe State?

Hypotheses

The following hypotheses were formulated to guide the study:

1. **HO₁**: There is no significant relationship between teachers' quality and teaching effectiveness of biology teachers in Senior Secondary Schools in Yobe State.
2. **HO₂**: There is no significant relationship between teachers' experience and teaching effectiveness of biology teachers in Senior Secondary Schools in Yobe State.
3. **HO₃**: There is no significant relationship between teachers' workload and teaching effectiveness of biology teachers in Senior Secondary Schools in Yobe State.
4. **HO₄**: There is no significant relationship among teachers' quality, experience, workload and teaching effectiveness of biology teachers in Senior Secondary Schools in Yobe State.

Significance of the Study

The findings of this study will be of benefits to secondary school students, biology teachers, school authorities, educational planners, government, parents and the society at large. This study will contribute to the improvement of the biology teachers in order to increase the success rate in the state by identifying the qualifications and qualities of effective teachers of biology in Yobe state. Once these are identified, they can be incorporated into professional development for biology teachers so that all biology students across the state can benefit from more effective teaching and increase their understanding. This study will also contribute to the body of knowledge about teacher effectiveness in biology.

Scope of the Study

This study was carried out on senior secondary two (SS2) biology students and their teachers in some selected government owned secondary schools in three educational zone of Yobe State, Nigeria. Senior Secondary two (SS2) is chosen because the students are not new to biology as a subject as the case with SSI; neither are they preparing for any external examination as is the case with SS3. The study covers the following teacher quality, teachers' qualification, teachers' experience, teachers' workload, teachers' use of instructional strategies, teachers' use of instructional material and teachers teaching effectiveness.

RESEARCH METHODOLOGY

Research Design

The study adopted a descriptive research design of correlational type. Adeyemi, (2008) describes a descriptive survey as collection of data from members of a population in order to determine the status of the population with regard to one or more variables.

Area of Study

The study was conducted in Yobe State. Yobe State lies along latitude 12⁰ north and longitude 11⁰ 30 east. It is bounded by Borno state in the east, Gombe in the south, Jigawa and Bauchi in the west, and shared international boundary with Niger republic in the north.

Population of the Study

The target population of the study was all SSII students (186 boys and 186 girls) of Senior Secondary school offering biology and biology teachers in the secondary schools in Yobe state. There were 9,231 SSII students offering biology in all senior secondary schools in Yobe state constitute the population of the study.

Sample and Sampling Techniques

The study was targeted to all teachers of biology and students of government owned senior secondary schools in Yobe state. A sample of 48 biology teachers and 372 SSII students in public senior secondary schools were used for the study, making a total sample of 420 respondents drawn from the three education zones of the state. SSII were used since they had stayed in school long enough with vast experience and had understanding of their teachers better. Stratified random sampling techniques were used to obtain the sample of SS2 students offering biology. Stratification ensures an even distribution of students.

Instrument for Data Collection

The instrument used for the study was questionnaire titled: Teacher Quality, Experience, Workload and Teaching Effectiveness (TQEWTE) designed by the researcher for biology teachers and students which has three sections A, B & C. Section A is a letter of introduction, Section B elicit bio-data

information from respondents, while section C consist of 28 items respectively, meant to give information on teachers Quality, Experience, Workload and Effectiveness requiring: Very high extent (5), High extent (4), Undecided (3), Low extent (2) and Very low extent (1) respectively used in the study.

Validation of the Instrument

The instrument was face and content validated by two experts. The experts examined the instrument to check the appropriateness of the items on the questionnaire and also ensured that the wordings of the items were appropriate.

Reliability of the Instrument

To determine the reliability of the instrument, a pilot testing was conducted in two Senior Secondary Schools that share similar characteristics with the target population using 20 students and 10 teachers of biology which are outside the study area. Their responses to the questionnaire items were subjected to statistical analysis using Cronbach Alpha to ensure internal consistency. The reliability coefficient obtained were 0.88 for teachers and students respectively.

Method for Data Collection

Four hundred and twenty TSAQ were used for the study. The arrangement was such that 48 biology teachers and 372 students from the three education zones assessed teachers' quality, experience, workload and their teaching effectiveness. A time-table was prepared to make the work easy with help of six research assistants.

Method of Data Analysis

The data analysis involves correlation analysis (matrix) to estimate the relationships among teachers' quality, experience and workload. Multiple regression analysis was used to determine statistical relationship among the variables, three independent variables and the dependent variable using Statistical Package for Social Science (SPSS) version 22. Pearson Product Moment Correlation was used to determine the relationship between two variables that are said to be correlated if change in one variable is accompanied by change in another in the same or opposite direction. The research questions were answered using descriptive statistic (Frequency count, Mean and Standard Deviation). Percentage was also used to determine the teachers' qualifications and experiences. All hypotheses were tested at 0.05 level of significance or 95% certainty of prediction.

RESULTS

4.1.1 Research Questions

Research Question 1

What is the extent of quality of biology teachers in senior secondary schools in Yobe state?

Table 1: Distribution of Biology Teachers Qualifications

Zone	Qualification	Frequency	Percent
A	NCE	3	6.25
	BSC. ED	5	10.4
	BSC +PGDE	2	4.17
	HND	2	4.17
	M.ED	0	0
B	NCE	6	12.5
	BSC. ED	8	16.7
	BSC. + PGDE	4	8.33
	HND	2	4.17
	M.ED	3	6.25
C	NCE	4	8.33
	BSC. ED	5	10.4
	BSC. + PGDE	2	4.17
	HND	1	2.08
	M.ED	1	2.08
TOTAL		48	100%

Table 1; indicate that majority of the biology teachers in all the three education zones hold B.SC. ED. (N=5; 10.4%, N=8; 16.7% and N=5; 10.4%). In proportion, this group is followed by NCE (N=3; 6.25%, N=6; 12.5% and N=4; 8.3%). Also, 8 teachers in the three zones hold B.SC with PGDE. Those in minorities are HND (N=5; 10.4%) and M.ED (N=4; 8.33%). These categories are qualified except the NCE could be considered as least for teaching in Secondary Schools in Yobe state.

Table 2: Summary of Mean and Standard Deviation of Level of Quality of Biology Teachers in Senior Secondary Schools in Yobe State

S/N	ITEMS	N= 420	Mean	S. D	Decision
1	Biology teachers conduct practical frequently with students		4.14	1.05	VHE
2	Teachers use teaching aids frequently during biology lessons		4.13	1.15	VHE
3	Biology teachers control/ manage class activities		4.27	1.05	VHE
4	Teachers encourage students to study biology		4.32	1.05	VHE
5	Teachers use resources to ensure mastery of biological concepts frequently.		3.99	1.21	HE
6	Biology teachers are friendly while teaching.		4.27	1.11	VHE
7	Biology teachers identify student's problems while teaching.		4.13	1.11	VHE
GRAND MEAN			4.18		

HE: High Extent; VHE: Very High Extent

Table 2 shows mean and standard deviation of opinion of respondents on quality of Biology teachers in senior secondary schools. The grand mean of 4.18 indicates high level of quality of Biology teachers in senior secondary schools in Yobe state.

Research Question 2

What is the extent of biology teachers experience in senior secondary schools in Yobe state?

Table 3: Distribution of Biology Teachers Experience.

Zone	Years Experience	Frequency	Percent
A	Below 5 years	2	4.17
	5-10 years	3	6.25
	11-15 years	2	4.17
	16-20 years	3	6.25
	21 and above	2	4.17
B	Below 5 years	4	8.33
	5-10 years	5	10.4
	11-15 years	6	12.5
	16-20 years	5	10.4
	21 and above	3	6.25
C	Below 5 years	3	6.25
	5-10 years	4	8.33
	11-15 years	2	4.17
	16-20 years	2	4.17
	21 years and above	2	4.17
TOTAL		48	100%

Table 3; indicate the highest proportion of teachers, 5 to 10 years and 16 to 20 years teaching experience (N=3; 6.25%) in zone A, 11 to 15 years (N=6; 12.5%) in zone B, and 5 to 10 years (N=4; 6.25%) in zone C. While (N=9; 19%) have below 5 years in all the three education zones. This

implies that the level of experience of biology teachers is at the upper side of the continuum. Hence, their quality of teaching is expected to be effective.

Table 4: Summary of Mean and Standard Deviation of Extent of Biology Teachers Experience in Senior Secondary Schools in Yobe State

S/N	ITEMS	N= 420	Mean	S. D	Decision
8	Biology teachers make use of microscope during lesson where applicable.		4.19	1.01	VHE
9	Biology teachers encourage the use of student's workbook.		4.12	1.01	VHE
10	Biology teachers improvise some teaching materials when not available		3.89	1.27	HE
11	Biology teachers make use charts where applicable when teaching biology.		4.02	1.37	VHE
12	Biology teachers have several ways to explain topic that covered in class.		3.89	1.28	HE
13	Biology teachers know when the class understands.		4.37	1.09	VHE
14	Biology teachers who have taught more than five years teach better.		4.19	1.08	VHE
GRAND MEAN			4.10		

HE: High Extent; VHE: Very High Extent

Table 4 indicates mean and standard deviation of opinion of respondents on the extent of Biology teachers experience in senior secondary schools. The grand mean of 4.10 indicates high extent of Biology teachers experience in senior secondary schools in Yobe state.

Research Question 3

What is the average workload of biology teachers in senior secondary schools in Yobe state?

Table 5: Summary of Mean and Standard Deviation of Average Workload of Biology Teachers in Senior Secondary Schools in Yobe State

S/N	ITEMS	N= 420	Mean	S. D	Decision
15	Biology teacher have more than 24 periods per week.		3.85	1.52	HE
16	Biology teachers teach more than 40 students in class.		4.09	1.33	VHE
17	Biology teachers mainly focus on course coverage.		3.86	1.24	HE
18	Biology teachers find difficult and stressful in giving assignment and marking them.		3.69	1.25	HE
19	Biology teachers use demonstration method, because of the large class size.		4.06	1.15	VHE
20	Biology teachers teach more than one science subjects.		3.70	1.21	HE
21	Biology teachers are discouraged in teaching large class.		3.61	1.28	HE
GRAND MEAN			3.84		

HE: High Extent; VHE: Very High Extent

Table 5 reveals mean and standard deviation of opinion of respondents on the average workload of biology teachers in senior secondary schools. The grand mean of 3.84 indicates high workload of biology teachers in senior secondary schools in Yobe state.

Research Question 4

What is the extent of biology teachers' teaching effectiveness in senior secondary schools in Yobe state?

Table 6: Summary of Mean and Standard Deviation of Extent of Biology Teachers' Effectiveness in Senior Secondary Schools in Yobe State

S/N	ITEMS	N= 420	Mean	S. D	Decision
22	Collaborative assignments are given to students by biology teachers.		3.94	1.37	VE
23	Biology teachers have good knowledge of subject matter.		3.75	1.24	HE
24	Biology teachers arouse students' interest before teaching.		4.16	1.23	VHE
25	Biology teachers have adequate time to plan for the lesson.		3.85	1.37	HE
26	The school management is considerate towards teaching biology.		3.59	1.47	HE
27	Students ask questions as lesson progress in biology class.		3.78	1.61	HE
28	Biology teachers praise students for correct answers.		3.98	1.32	HE
Grand Mean			3.81		

HE: High Extent; VHE: Very High Extent

Table 6 shows mean and standard deviation of opinion of respondents on the teachers' effectiveness in senior secondary schools. The grand mean of 3.81 indicates high Biology teachers' teaching effectiveness in senior secondary schools in Yobe state.

4.1.2 Hypotheses

Ho₁: There is no significant relationship between teachers' quality and teaching effectiveness of Biology teachers in senior secondary schools in Yobe State.

Table 7: Pearson Product Moment Correlation Coefficient of Relationship between Teachers' Quality and Teaching Effectiveness

		QUALITY TEACHERS	OF TEACHING EFFECTIVENESS
TEACHERS' QUALITY	Pearson Correlation	1	.947**
	Sig. (2-tailed)		.000
	N	420	420
TEACHING EFFECTIVENESS	Pearson Correlation	.947**	1
	Sig. (2-tailed)	.000	
	N	420	420

** . Correlation is significant at the 0.01 level (2-tailed).

Table 7 shows Pearson Product Moment Correlation analysis conducted to test whether significant relationship exist between quality of Biology teachers and teachers' effectiveness. The result indicates that there is a strong, positive correlation between quality of Biology teachers and teachers' teaching effectiveness, $r = 0.947$, $p < 0.05$. This shows that teachers' quality correlates with the general teaching effectiveness portrayed by biology teachers. Based on this, there is a significant relationship exist between quality of biology teachers and their teaching effectiveness.

Ho₂: There is no significant relationship between teachers' experience and teaching effectiveness of Biology teachers in senior secondary schools in Yobe State.

Table 8: Pearson Product Moment Correlation Coefficient of Relationship between Teachers' Experience and Teaching Effectiveness

		EXTENT OF BIOLOGY TEACHERS' EXPERIENCE	TEACHING EFFECTIVENESS
EXTENT OF BIOLOGY TEACHERS' EXPERIENCE	Pearson Correlation	1	.975**
	Sig. (2-tailed)		.000
	N	420	420
TEACHING EFFECTIVENESS	Pearson Correlation	.975**	1
	Sig. (2-tailed)	.000	
	N	420	420

** . Correlation is significant at the 0.01 level (2-tailed).

Table 8 shows Pearson Product Moment Correlation analysis conducted to test whether significant relationship exist between Biology teachers' experience and teaching effectiveness. The result indicates that there is a strong, positive correlation between Biology teachers' experience and teaching effectiveness, $r = 0.975$, $p < 0.05$. This shows that teachers' experience correlates with the overall teachers' teaching effectiveness portrayed by teachers. Based on this, there is a significant relationship exist between biology teachers' experience and their teaching effectiveness.

Ho₃: There is no significant relationship between teachers' workload and teaching effectiveness of Biology teachers in senior secondary schools in Yobe State.

Table 9: Pearson Product Moment Correlation Coefficient of Relationship between Teachers' Workload and Teachers' Effectiveness

		TEACHERS' WORKLOAD	TEACHING EFFECTIVENESS
	Pearson Correlation	1	.989**
	Sig. (2-tailed)		.000
	N	420	420
TEACHING EFFECTIVENESS	Pearson Correlation	.989**	1
	Sig. (2-tailed)	.000	
	N	420	420

** . Correlation is significant at the 0.01 level (2-tailed).

Table 9 shows Pearson Product Moment Correlation analysis conducted to test whether significant relationship exist between teachers' workload and teaching effectiveness. The result shows that there is a strong, positive correlation between teachers' workload and teaching effectiveness, $r = 0.989$, $p < 0.05$. This indicates that teachers' workload correlates with the overall teachers' teaching effectiveness portrayed by biology teachers. Based on this empirical evidence, there is a significant relationship between workload of biology teachers and their teaching effectiveness.

Ho₄: There is no significant relationship among teachers' quality, experience, workload and teaching effectiveness of Biology teachers in senior secondary schools in Yobe State.

Table 10a: Summary of ANOVA of Teachers' Quality, Experience, Workload and Teachers' Teaching Effectiveness

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	723.560	3	241.187	7567.292	.000 ^b
	Residual	13.259	416	.032		
	Total	736.819	419			

Table 10a shows the summary of ANOVA of multiple regression analysis conducted to test whether any significant relationship exist among teachers' quality, experience, workload and teachers' teaching effectiveness. The result shows that teachers' quality, experience, workload and teachers' teaching effectiveness are significantly related, $F(3, 416) = 7567.292$, $p = 0.000$. Therefore, the null hypothesis should be rejected since the p – value (0.000) is less than 0.05 level of significant.

Table 10b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.991 ^a	.982	.982	.17853

a. Predictors: (Constant), TEACHERS' WORKLOAD, TEACHERS' QUALITY, EXTENT OF BIOLOGY TEACHERS' EXPERIENCE

The result in Table 8b is a model summary which shows how the independent variables explain the variance in the dependent variable. The result shows that the predictor (teachers' quality, experience, and workload) explained 98.2% of the variance in teachers' effectiveness. Teachers' quality, experience, workload and teachers' teaching effectiveness were found to have strong positive relationship which is indicated by r value = 0.991.

Findings of the Study

The major findings of the study are presented below:

1. Majority of biology secondary school teachers in Yobe state was professionally qualified; most of them had university degrees or minimum of NCE.
2. Findings revealed that teachers with cognate teaching experience turnout with relatively high teaching effectiveness.

3. There were significance relationships in the effectiveness of teachers' quality, experience and workload.
4. Furthermore, the ratio of teachers to students was within unacceptable range, but their teachings were effective. This is because they could not engage students in hands-on activities even by placing them in groups due to limited resources compared to the large number of students. This been observed to all teachers interviewed. Due to heavy workload they face for instance, one biology teacher has to prepare practical session for the SSI, SSII and SSIII students which takes almost whole day, there are shortage of laboratory equipment and reagents. At the same time, teacher has to teach normal period which is difficult to handle.

DISCUSSION OF THE FINDINGS

The result above revealed that teachers' quality, experience and workload have significant contribution to teaching effectiveness in senior secondary schools in Yobe state. A cursory look at this finding shows that teachers' quality is very crucial and plays a substantial role in classroom practices. Teachers' qualities such as subject matter knowledge, pedagogical knowledge, teacher-student relationship, experience and qualification when put together correlates positively to teaching effectiveness.

Table 5 shows that the calculated r-value of .947 at the 0.05 level of significance. Hence, the null hypothesis which states that there is no significant relationship between teachers' quality and teaching effectiveness is rejected. This implies that there is a significant relationship between teachers' quality and teaching effectiveness in senior secondary schools in Yobe State. This is in line with the opinion of the Centre for Education Policy Analysis (CEPA, 2009), which asserted that effective teachers are the most important factor in the school organization because they help to close the achievement gap. That is to say, without quality teachers, school effectiveness cannot be achieved. The Government succinctly put it that no education system could rise above the quality of its teachers (Federal Republic of Nigeria 2004).

The finding is in harmony with Rice, (2010) who stated that experience promotes effectiveness. The finding is also in line with Owolabi, (2007) who opined that the Government should find all possible means to retain veteran and experienced teachers who are still willing to serve so that they can contribute their wealth of experience towards the improvement of the system.

Findings by Onyekuru and Ibegbunam (2013) revealed that teaching experience has a significant influence on teaching effectiveness of teachers. But, this finding of study has contradicted the study conducted by Sodhi (2010); and Chowdhury (2014), they found that teaching experience has no significant impact on effectiveness of teachers. Findings by Wang and Fwu (2007) were also in line with these findings that were reported that the teaching showed that the effectiveness of teaching and learning is credited to the instructor's quality.

The key to teaching effectiveness is teachers. It is necessary to probe into teachers' quality to help teachers ascertain their shortcomings so that they cannot only improved themselves but also increase their teaching effectiveness. This finding is related to those of researchers such as Martin, Mullis, Gregory, Hoyle, and Shen (2000) who stated that in a situation where experienced teachers were not promoted out of the classroom into management positions, level of experience had a significant influence on the teaching effectiveness of the teachers. Dunkin, 1997; Rice, 2004; and Bauer, 2005 who stated that there is a positive effect of experience on teachers' effectiveness; specifically, the learning by doing, effect is more obvious in the early years of teaching. This finding agrees with the finding study by Aiken (1991) who contended that teaching experience of teachers is significantly related to their teaching effectiveness.

This finding is also consistence with Murnane and Philips (1982) who found a positive relationship between teachers' effectiveness and their years of experience. Several studies have found that secondary school teachers who had five or more years of teaching experience were significantly more effective than those who had less than five years of teaching experience.

Little research has reported findings of teachers receiving out- of- field teaching assignments, that is, subject areas outside of their areas of expertise. However, Dibbon (2004) was one researcher who mentioned that teachers were being assigned subject to teach outside of their areas of expertise which added to their workload and stress level.

Findings

further revealed that the classroom teaching is not effective in every ramification ranging from class atmosphere, use of instructional objectives, teaching techniques, evaluation and assignments. This could be traced to the problems of large class size, workload of the few teachers' available, lack of facilities and equipment, high cost of these specialized equipments, lack of funds, society's negative attitude and students' apathy. Ineffective classroom teaching found in this study is in tandem with findings of Braun (2005), McCaffery et al. (2004) and Sanders (2000) who traced poor student performance to teachers' poor effectiveness in teaching.

Summary

The purpose of this study was to investigate the relationship among teachers' quality, experience, workload and their teaching effectiveness in senior secondary schools in Yobe state.

Major findings of the study are that biology teachers' extent of quality, experience, average workload and their teaching effectiveness were very high extent. The study also found out that there is a strong, positive relationship among teachers' quality, experience, workload and their teaching effectiveness. Teachers had a variables and effectiveness of presentation.

Findings revealed that good number of sampled school lacked biology laboratory, where available they are often in bad shape. Findings revealed that teachers with cognate teaching experience turnout with relatively high teaching effectiveness.

Furthermore, the findings indicated that teacher had difficulty in teaching large classes. This is because they could not engage students in hands-on activities even by placing them in groups due to limited resources compared to the large number of students.

CONCLUSION

This study focused on the relationship between teachers' quality, experience, workload and their teaching effectiveness. The results showed that teacher professional qualification and teacher experience, which were examined as teachers' quality variables were positively related to teaching effectiveness. Other variables such as teacher's status and level of dedication to duty, which could influence teacher quality, were not considered in this study. The findings imply that professionally qualified and experienced teachers could add value to the outcome of the school system.

The results of this study indicate that when teaching methods are effectively utilized, teaching effectiveness of biology teachers will increase tremendously. It was also established that quality of teachers to a large extent determine teachers' teaching effectiveness, because professional teachers will make the best of every unpleasant situation and that teachers' experience is an added advantage.

RECOMMENDATIONS

On the basis of findings and conclusion, following recommendations are made:

1. Teachers need to update teacher's knowledge on ways of teaching biology and acquaint them with other new innovations characterized by effectiveness, creativity and improvement. This could be made possible by frequently organizing seminars, workshops and in-service training for biology teachers.
2. Only teachers who have relevant qualifications and relevant teaching experiences should be recruited to teach in senior secondary schools in Yobe state. The practice of recruiting non-professional teachers who do not have relevant qualifications to teach in secondary schools should be discouraged.
3. Workshops and seminars for school administrators and managers should be organized to educate them on how to design teacher's job specification and workload.
4. Finally there is also an urgent need to employ more qualified teachers to teach the subject (biology) in senior secondary schools, and there should be periodic supervision and assessment in relation to the teachers' teaching effectiveness in the subject.

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