IOSR Journal of Research & Method in Education (IOSR-JRME)
e-ISSN: 2320–7388, p- ISSN: 2320-737x Volume 14, Issue 3 Ser. 3 (May. – June. 2024), 56-68
www.iosrjournals.org

Physics Teachers' Qualification and Students' Academic Performance in External Examinations: A Case Study of Senior Secondary Schools in Isiala-Ngwa North Local Government Area, Abia State, Nigeria

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Abstract
The study considered the qualification of teachers as a factor that affects students' performance in external examinations in Isiala-Ngwa North Local Government Area (LGA) of Abia State. Pearson Product Moment correlation coefficient was used to determine the significant relationship between the two variables. Data was collected through direct access to the school's records where the number and qualifications of the teachers were ascertained as well as the results of the students in external examinations for each of the twenty senior secondary schools spread across the local government for a three year period of 2020 to 2022. Results show that an average of 595 students and 202 students registered for physics in the West African Senior School Certificate Examination (WASSCE) and the National Examination Council Senior School Certificate Examination (NECO SSCE) respectively for the three year period. The correlation coefficient of 0.74 and 0.81 were obtained for the relationship between teachers' qualification and students' success in WASSCE and NECO SSCE respectively while a negative correlation coefficient was obtained for the relationship between students' failure rate and teachers' qualification for both WASSCE and NECO SSCE implying that the higher the qualification of a teacher, the higher the performance of the students and vice versa.

Keywords: *Physics, Teachers' qualification, Academic performance, External examination*

Date of Submission: 03-06-2024 Date of Acceptance: 13-06-2024

I. Introduction

Physics is a physical science which studies the nature of matter and energy. It is a subject studied right from the senior secondary school to the tertiary education level thus laying the foundation for technological knowledge [1]. Physics is regarded as the most fundamental science with the reputation of being technical and highly mathematical with strong predictive power. This makes it to be perceived by many students and teachers to be difficult [2]. Therefore, a physics teacher is not just an ordinary teacher. They are unique in the sense that they possess both professional and teaching qualification. A whole lot of expectations are required from a physics teacher both from the professional and competence perspectives. Given his professional qualification, a physics teacher must be sensitive to dynamics in knowledge, acknowledge changes in his field and must be innovative. Being stereotype in dispensing knowledge is not a good attribute of a physics teacher [3].

According to [4], physics teacher should have: mastery of the subject, excellent quantitative and problem solving skills, ability to clarify complex ideas in simple terms, ability to motivate students, good imaginations to make abstract concepts real, good class control, a sense of organization and discipline, and should frequently monitor students progress through tests, formal and informal oral and written quizzes. The concept of teacher qualification and its result in the teaching and learning process has been central in the field of discussion in education. The quality of teacher training and capacity building goes a long way in improving the skill base of science and physics teachers. This is because it provides teachers with the ability and adequate methodology to impart to learners basic scientific literacy and practical skills to explore the physical and natural world in order to achieve economic growth and technological development of a country [5].

Teacher qualification therefore is a requisite for meeting the objectives of the physics curriculum in secondary schools. This thus requires proper teacher training program and retraining which will afford the teachers with training in specialized areas, acquisition of basic teaching skills, enhanced impartation on learners through evolving knowledge and ideas, application of different methods of learning that will be of benefit to all classes of learners be it fast, intermediate or slow, development of initiatives on engaged practical activities for

creativity in theory and practice. Succinctly put, teacher qualification provides teachers with professional and intellectual background adequate in discharging their duties and as well enables them to adapt to the constantly changing situations in the environment and in the country at large [6]. Teacher qualification is therefore considered to be the most important factor in improving the achievement of students in physics and science education in general [7].

Students' performance on the other hand is hinged on several factors and not solely on the qualification or competence of the teacher. [8] Mushtaq and Khan (2012) established that the performance of science students is affected by social, psychological, economic, environmental and personal factors which vary from country to country and from person to person and this is more challenging in rural areas where students face a whole lot of problems. Communication, learning facilities, proper guidance and family background are also factors that affect the performance of students [9 – 11].

Academic performance is a measure of the indicative and responsive ability that expresses in an estimated way, the level of achievement of set goals and objectives in the subject or program that a learner has attained in the course of education or training. It is also called academic achievement and it is a combination of cognitive and non-cognitive outcomes such as behavioral and psychological connotations [12]. Academic performance is usually expressed in grades obtained after an assessment that requires writing of given examination [13]. Examinations can either be internal as organized by the educational institution or external. External examination is the process of measuring how much learners know and can demonstrate by making them to respond to standard test items administered by an organized body different from the learner's education institution. External examination is aimed at grading learners and attaching values to them in terms of the level of knowledge they possess thereby showcasing the knowledge and skills given attention to in class [14].

External examinations are usually uniform for all learners in a particular geographical area and as such are considered to provide a level playing ground for all learners in order to sustain the merit, objectivity and neutrality associated with such examinations. External examinations is usually conducted at the end of school education whereby those who successfully complete the curriculum are selected and the eligibility of students for the level of higher education is ascertained [15]. It therefore implies from the foregoing that a qualified teacher will integrate his competence, skills as well as the social, psychological and other factors affecting learning towards enhancing the academic performance of the students under his/her guidance.

Plethora of studies have been carried out in investigating students performance as affected by teacher's qualification alongside other factors at different levels of education for different subject areas. According to [16], teachers are the most important element in terms of achieving the aims of the school and as such they are sacred heroes of school management and the real possessors of educational product and the key to the success of the students. This corroborates what [17] earlier inferred that the success of the teachers who put into practice and carries out the system of education is inseparable to the success of the education system. This is because every education model cannot offer services above the level of the persons driving the model.

[18] avered that a qualified teacher will be able to implement differentiated instruction technique for greater academic performance of the students unlike an unqualified teacher. [19] further explains that professional teachers use the appropriate teaching methods that promotes students' performance while harping on the need for adequate pre-service and in-service professional development of teachers. This implies that qualified teachers have higher cognitive ability than less qualified ones and as such cognitive variables of teachers are the most important factor in the performance of a student [19].

[7] discovered that there was a significant influence of teacher qualification and experience on the quality of chemistry education in Akwa-Ibom State of Nigeria. Qualified teachers effectively employ probing questions, problem solving skills, discussion and feedback during classroom interactions and they tend to do better significantly than their counterparts who had no exposure in teacher training [20]. [21] observed that teacher experience has a significant positive effect on student achievement with more than half of the gains happening at the beginning years of the teacher's engagement while the substantial gains occur over subsequent years. [22] while looking into science education in Nigeria infers that students by teachers with lower qualifications performed worse than those taught by teachers with higher qualifications. This is evident in the number of students who did better in physics when taught by teachers with higher qualifications. [23] while juxtaposing learning facilities, teacher qualification and student's performance observed that the learning process will not be effective if the teacher is not well trained irrespective of the careful design of the curriculum, availability of scientific accurate textbooks and laboratory facilities.

[24] while looking at the Students' academic achievement in Nigeria observed that the personal qualities of the teacher and certification are integral factors that significantly affect students' academic achievement. This is similar to what [25] discovered in Delta State, Nigeria where a positive relationship exists between teacher efficiency, years of experience and students' academic achievement. In the Northeastern part of Nigeria, [26] established the relationship between teacher's qualities and its effects on students performance in

the study of fine and applied arts in the colleges of Education. He inferred that teachers' qualification, experience and subject mastery have significant impact on students' academic performance.

[27] studied the performance of students in Jerusalem public schools and discovered that students taught by teachers with higher years of training had significantly higher test scores than students taught by teachers with lesser years of training. Communication skill of the teacher and the students' understanding of the spoken language were studied by [28] and he observed that a strong correlation exists between students performance and communication skill of the teacher. In Bangladesh, [29] observed that the performance of Urban University students depends largely on the teacher's qualification and competence alongside; attendance of the students to class and the standard of living of the parents. In Pakistan, it was observed that science students who are taught with the lecture method do not perform well in external examination when compared with their counterparts taught using student approach method [30]. This therefore brings to the fore the need for adequate pedagogical skill of the teacher in the effective teaching of any science subjects and any other subject matter.

In China, [31] established that the makeup of teachers is an important factor in the academic performance of teachers as it pertains to teacher efficacy, teaching behavior, teacher professional development practices, style of teaching and student-teacher relationship. Aside the qualification of teachers which is pivotal, a couple of other factors also contribute to the academic performance of students in external examinations such as the personal characteristics of the students and environment - family environment and school environment. Other factors include age, family income, study hour, motivation and language proficiency. There are scholarly articles that buttress the afore stated factors as can be seen in the works of [12, 32- 39].

This work therefore seeks to ascertain the level of physics teachers' qualifications and their effect on the level of performance of students in external examinations in Isiala-Ngwa North LGA, Abia State, Nigeria.

About the Study Area

Isiala-Ngwa North is one of the local government areas in Abia Central District of Abia State, Nigeria covering an area of 283 km^2. The population of people in the area is 153,734 persons based on the 2006 national census. The annual temperature is 27 ^0C while the average humidity and wind speed is 65% and 10 $kmhr^{-1}$ respectively [40]. The annual rainfall of Isiala Ngwa is 4000 mm annually, with a rainforest type of vegetation and a relatively even topography thus its suitability for agriculture [41]. Economically, Isiala-Ngwa North is mainly agrarian in nature and they produce food crops which are sold mainly on market days. Nonetheless, there are few persons who are engaged in white-collar jobs. Isiala Ngwa North is made of different communities which includes; Ngwa-Ukwu, Ama-Asa, Umuoha, Ihie, Ntigha, Nsulu, Abayi, Obikabia and Okpuala Ngwa which serves as its administrative headquarters [40]. It is bounded in the North, South, and West by Umuahia South, Isiala-Ngwa South and Ikwuano LGAs respectively while it is bounded in the West and South East by Imo and Akwa-Ibom States respectively as shown in Figure 1

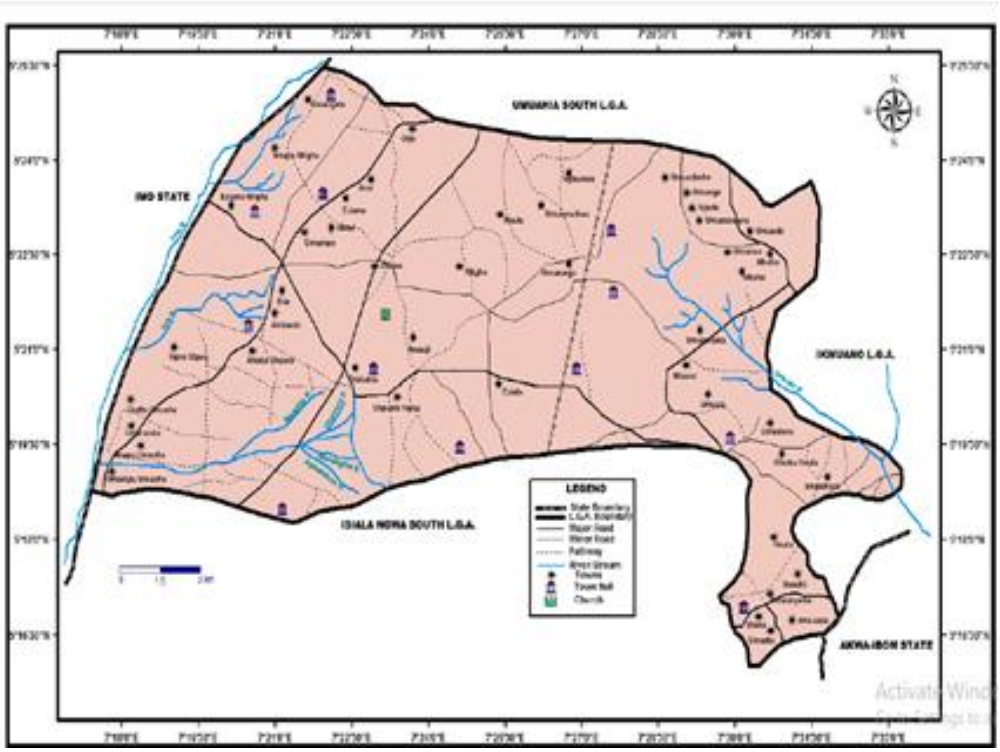

Figure 1: Map of Isiala-Ngwa LGA showing the Localities. Source: [42].

Research Questions and Hypotheses

The following research questions were raised to guide the study research

1. What are the qualifications of physics teachers in the secondary schools in Isiala Ngwa North LGA of Abia State?
2. What is the level of enrollment and performance of secondary school students in physics external examinations (WASSCE and NECO SSCE) in Isiala-Ngwa North LGA of Abia State?
3. What is the relationship between the qualification of physics teachers and the students performance in external examinations (WASSCE and NECO SSCE) in Isiala-Ngwa North LGA of Abia State?

The following null hypotheses guided the study and they were tested at 0.05 level of significance:

H_{01}; There is a significant relationship between the qualification teachers and the level of success of the students in external academic examinations (WASSCE and NECO SSCE)

H_{02}; There is a significant relationship between the qualification of teachers and the level of failure of the students in external academic examinations.

II. Method

The Pearson's Product Moment Correlation Coefficient (r) was used in designing the study. The study covers most of the schools in Isiala-Ngwa North LGA. Twenty senior secondary (20) schools were considered. The schools are located around ten communities geographically distributed within the LGA. The communities include; Abayi, Amaorji, Ihieoji, Iihie, Obikabia, Okpuala Ngwa, Uratta, Ntigh, Nsulu and Nbawsi. Data of the teachers' qualifications and the academic performance of the their students were obtained by from the official records of the schools visited.

The qualification of physics teachers is assigned the independent variable x while Student's academic performance in external examinations was assigned the dependent variable y_n. Two external examinations were considered namely; the West African Senior School Certificate Examination (WASSCE) conducted by the West African Examinations Council (WAEC) and the Senior Secondary School Examination (SSCE) conducted by the National Examination Council (NECO). A three year interval spanning from 2020 – 2022 was considered for both external examinations. The average percentage success and average percentage failure of students in WASSCE were assigned y_1 and y_2 respectively. Similarly, the average percentage success and average percentage failure of students in SSCE were assigned y_3 and y_4 respectively.

The schools were numbered in roman numerals I – XX while a grade point of 1, 2, 3 and 4 were assigned to a maximum qualification of NCE, B.Sc/BSc.Ed, MSc.Ed and Ph.D respectively for each of the teachers in each of the schools. The corresponding grades of the students were obtained alongside the

percentage performance of the students in each of the schools for the year 2020 – 2022 and an average obtained for the three years for each of WASSCEE and SSCE. The values obtained were entered into an excel spreadsheet and the correlation coefficient computed using equation 1 as defined by [43].

$$r = \frac{\sum xy_n - \frac{\sum x \sum y_n}{N}}{\left[\left(\sum x^2 - \frac{\left(\sum x\right)^2}{N}\right)\left(\sum y_n^2 - \frac{\left(\sum y_n\right)^2}{N}\right)\right]^{1/2}} \quad (1)$$

where
N= Sample size (20)
x = grade point of the qualification of teachers
y_n = performance level of students in a given external examination for $1 \leq n \leq 4$.
Therefore the various dependent variables are defined thus;
y_1 = Average percentage success of students in WASSCE.
y_2 = Average percentage failure of students in WASSCE.
y_3 = Average percentage success of students in NECO SSCE.
y_4 = Average percentage failure of students in NECO SSCE.
Equation 1 can be rewritten in a simple form as;

$$r = \frac{SS_{(xy_n)}}{\left[SS_{(y_n)} SS_{(x)}\right]^{1/2}} \quad (2)$$

where SS is sum of squares such that

$$SS_{(xy_n)} = \sum xy_n - \frac{\sum x \sum y_n}{N} \quad (3)$$

$$SS_{(x)} = \left(\sum x^2 - \frac{\left(\sum x\right)^2}{N}\right) \quad (4)$$

$$SS_{(y_n)} = \left(\sum y_n^2 - \frac{\left(\sum y_n\right)^2}{N}\right) \quad (5)$$

The percentage success and failure of students in both WASSCE and SSCE each were calculated and afterwards correlated with the qualification level of the physics teacher using Microsoft excel software to ascertain the relationship between them.

The percentage success and failure were calculated using equations 6 and 7 respectively

$$\text{Percentage Success} = \frac{(\text{Number of Students with C6 and Above}) \text{ x } 100}{\text{Total Number of Students}} \quad (6)$$

$$\text{Percentage Failure} = \frac{(\text{Number of Students with D7 and Below}) \text{ x } 100}{\text{Total Number of Students}} \quad (7)$$

$$= 100 - \text{Percentage Success}$$

Minimum of credit grades were considered successful while a grades below a credit were considered to be a failure.

III. Results

Table 1 shows the number of physics teachers and their qualifications while Table 2 shows the performance of students in WASSCE and NECO SSCE

Test of Hypotheses

H_{01}; There is a Significant Relationship Between the Qualification of Teachers and The Level of Success of The Students in External Academic Examinations

Table 3 shows a correlation coefficient of 0.75 between teachers' qualification and students' success in WASSCE within a three year period while Table 4 also shows a correlation coefficient of 0.81 between teachers' qualifications and students' success in NECO SSCE. Therefore the null hypothesis is accepted which implies that there is a high relationship between teachers' qualification and students success in external examinations.

H_{02}; There is a Significant Relationship Between the Qualification of Teachers and The Level of failure of the Students in External Academic Examinations.

Table 5 shows a negative correlation coefficient of -0.54 between teachers' qualification and students' failure in WASSCE while Table 6 shows a negative correlation coefficient of -0.07 between teachers' qualification and students' failure in NECO SSCE. Therefore, teachers' qualification has negative correlation with students' performance in external examinations in Isiala-Ngwa LGA. This implies that the higher the qualification of teachers, the lower the failure rate.

Table 1: Number of Physics Teachers and their Qualifications.

SCHOOL	NUMBER OF PHYSICS TEACHERS AND THEIR QUALIFICATIONS				TOTAL NO OF PHYSICS TEACHERS	GRADE POINT
	NCE	B.Sc/BSc.Ed	M.SC/M.Ed	Ph.D		
I	1	0	0	0	1	1
II	2	0	0	0	2	2
III	0	1	1	0	2	5
IV	1	0	0	0	1	1
V	0	2	0	0	2	4
VI	0	1	1	0	2	5
VII	1	0	0	0	1	1
VIII	0	0	1	1	2	7
IX	1	0	0	0	1	1
X	0	1	0	0	1	2
XI	0	0	0	0	0	0
XII	0	1	1	0	2	5
XIII	1	0	0	0	1	1
XIV	1	0	0	0	1	1
XV	0	0	0	0	0	0
XVI	0	0	1	0	1	3
XVII	0	1	0	0	1	2
XVIII	0	0	0	0	0	0
XIX	1	0	0	0	1	1
XX	1	0	0	0	1	1
TOTAL	**10**	**7**	**5**	**1**	**23**	**43**

Table 2: Performance of Students in WASSCE and NECO SSCE

SCHOOL	YEAR	STUDENTS' PERFORMANCE					
		WASSCE			NECO SSCE		
		Total No of Students	% SUCCESS	% FAILURE	Total No of Students	% SUCCESS	% FAILURE
I	2020	15	33.33	66.67	7	57.14	42.86
	2021	11	45.45	54.55	5	60.00	40.00
	2022	18	44.44	55.56	11	45.45	54.55
	MEAN	**15**	**41.08**	**58.92**	**8**	**54.20**	**45.80**
II	2020	20	85.00	15.00	12	66.67	33.33
	2021	30	60.00	40.00	10	70.00	30.00
	2022	25	80.00	20.00	8	75.00	25.00
	MEAN	**25**	**75.00**	**25.00**	**10**	**70.56**	**29.44**
III	2020	40	70.00	30.00	13	84.62	15.38
	2021	53	60.38	39.62	20	85.00	15.00

	2022	47	80.85	19.15	18	88.89	11.11
	MEAN	**47**	**70.41**	**29.59**	**17**	**86.17**	**13.83**
IV	2020	30	33.33	66.67	15	46.67	53.33
	2021	27	48.15	51.85	10	40.00	60.00
	2022	20	45.00	55.00	8	37.50	62.50
	MEAN	**26**	**42.16**	**57.84**	**11**	**41.39**	**58.61**
V	2020	51	70.59	29.41	10	80.00	20.00
	2021	62	69.35	30.65	25	72.00	28.00
	2022	57	59.65	40.35	18	72.22	27.78
	MEAN	**57**	**66.53**	**33.47**	**18**	**74.74**	**25.26**
VI	2020	60	80.00	20.00	35	71.43	28.57
	2021	53	73.58	26.42	20	60.00	40.00
	2022	58	67.24	32.76	27	88.89	11.11
	MEAN	**57**	**73.61**	**26.39**	**27**	**73.44**	**26.56**
VII	2020	7	14.29	85.71	0	0.00	0.00
	2021	10	30.00	70.00	0	0.00	0.00
	2022	8	50.00	50.00	0	0.00	0.00
	MEAN	**8**	**31.43**	**68.57**	**0**	**0.00**	**0.00**
VIII	2020	63	84.13	15.87	20	85.00	15.00
	2021	55	90.91	9.09	18	88.89	11.11
	2022	60	75.00	25.00	23	82.61	17.39
	MEAN	**59**	**83.35**	**16.65**	**20**	**85.50**	**14.50**
IX	2020	15	40.00	60.00	7	28.57	71.43
	2021	17	35.29	64.71	12	41.67	58.33
	2022	18	33.33	66.67	10	40.00	60.00
	MEAN	**17**	**36.21**	**63.79**	**10**	**36.75**	**63.25**
X	2020	35	65.71	34.29	0	0.00	0.00
	2021	28	78.57	21.43	0	0.00	0.00
	2022	38	78.95	21.05	0	0.00	0.00
	MEAN	**34**	**74.41**	**25.59**	**0**	**0.00**	**0.00**
XI	2020	5	40.00	60.00	0	0.00	0.00
	2021	4	50.00	50.00	0	0.00	0.00
	2022	0	0.00	0.00	0	0.00	0.00
	MEAN	**5**	**45.00**	**55.00**	**0**	**0.00**	**0.00**
XII	2020	27	88.89	11.11	15	86.67	13.33
	2021	18	77.78	22.22	8	100.00	0.00
	2022	20	80.00	20.00	13	76.92	23.08
	MEAN	**22**	**82.22**	**17.78**	**12**	**87.86**	**12.14**
XIII	2020	32	71.88	28.13	0	0.00	0.00
	2021	35	74.29	25.71	0	0.00	0.00
	2022	38	78.95	21.05	0	0.00	0.00
	MEAN	**35**	**75.04**	**24.96**	**0**	**0.00**	**0.00**
XIV	2020	53	18.87	81.13	20	25.00	75.00
	2021	60	40.00	60.00	18	33.33	66.67
	2022	57	38.60	61.40	23	30.43	69.57
	MEAN	**57**	**32.49**	**67.51**	**20**	**29.59**	**70.41**
XV	2020	0	0.00	0.00	0	0.00	0.00
	2021	0	0.00	0.00	0	0.00	0.00
	2022	0	0.00	0.00	0	0.00	0.00
	MEAN	**0**	**0.00**	**0.00**	**0**	**0.00**	**0.00**
XVI	2020	12	83.33	16.67	5	100.00	0.00
	2021	10	90.00	10.00	10	70.00	30.00
	2022	8	75.00	25.00	17	64.71	35.29
	MEAN	**10**	**82.78**	**17.22**	**11**	**78.24**	**21.76**
XVII	2020	40	55.00	45.00	15	53.33	46.67
	2021	53	47.17	52.83	20	50.00	50.00
	2022	47	53.19	46.81	23	47.83	52.17
	MEAN	**47**	**51.79**	**48.21**	**19**	**50.39**	**49.61**
XVIII	2020	3	33.33	66.67	0	0.00	0.00
	2021	0	0.00	0.00	0	0.00	0.00
	2022	2	0.00	100.00	0	0.00	0.00

	MEAN	**3**	**16.67**	**83.33**	**0**	**0.00**	**0.00**
XIX	2020	40	40.00	60.00	12	41.67	58.33
	2021	53	43.40	56.60	22	45.45	54.55
	2022	55	67.27	32.73	23	30.43	69.57
	MEAN	**49**	**50.22**	**49.78**	**19**	**39.19**	**60.81**
XX	2020	20	40.00	60.00	0	0.00	0.00
	2021	28	39.29	60.71	0	0.00	0.00
	2022	17	41.18	58.82	0	0.00	0.00
	MEAN	**22**	**40.15**	**59.85**	**0**	**0.00**	**0.00**

Average for the three year period	**WASSCE**			**NECO SSCE**		
	Total No of Students	**% Success**	**% Failure**	**Total No of Students**	**% Success**	**% Failure**
	595	**53.53**	**46.47**	**202**	**62.16**	**37.84**

Table 3: Correlation Coefficient Between Teachers' Qualification and Students Success in WASSCE

SCHOOL	**GRADE POINT OF THE QUALIFICATION OF PHYSICS TEACHERS (X)**	**X^2**	**AVERAGE % SUCCESS OF STUDENTS IN WASSCE (Y_1)**	**Y_1^2**	**XY_1**	**SS(X)**	**SS(Y_1)**	**SS(XY_1)**	**r(XY_1)**
I	1	1	41.08	1687.57	41.08				
II	2	4	75.00	5625.00	150				
III	5	25	70.41	4957.57	352.05				
IV	1	1	42.16	1777.47	42.16				
V	4	16	66.53	4426.24	266.12				
VI	5	25	73.61	5418.43	368.05				
VII	1	1	31.43	987.84	31.43				
VIII	7	49	83.35	6947.22	583.45				
IX	1	1	36.21	1311.16	36.21	76.55	10789.91	678.6075	0.746685
X	2	4	74.41	5536.85	148.82				
XI	0	0	45.00	2025.00	0				
XII	5	25	82.22	6760.13	411.1				
XIII	1	1	75.04	5631.00	75.04				
XIV	1	1	32.49	1055.60	32.49				
XV	0	0	0	0.00	0				
XVI	3	9	82.78	6852.53	248.34				
XVII	2	4	51.79	2682.20	103.58				
XVIII	0	0	16.67	277.89	0				
XIX	1	1	50.22	2522.05	50.22				
XX	1	1	40.15	1612.02	40.15				
TOTAL	**43**	**169**	**1070.55**	**68093.78**	**2980.29**				

Table 4: Correlation Coefficient Between Teachers' Qualification and Students Success in NECO SSCE

SCHOOL	**GRADE POINT OF THE QUALIFICATION OF PHYSICS TEACHERS (X)**	**X^2**	**AVERAGE % SUCCESS OF STUDENTS IN NECO SSCE (Y_3)**	**Y_3^2**	**XY_3**	**SS(X)**	**SS(Y_3)**	**SS(XY_3)**	**r(XY_3)**
I	1	1	54.20	2937.64	54.20				
II	2	4	70.56	4978.71	141.12				
III	5	25	86.17	7425.27	430.85				
IV	1	1	41.39	1713.13	41.39	76.55	22841.71	1075.307	0.813197
V	4	16	74.74	5586.07	298.96				
VI	5	25	73.44	5393.43	367.20				
VII	1	1	0.00	0.00	0.00				
VIII	7	49	85.50	7310.25	598.50				

IX	1	1	36.75	1350.56	36.75
X	2	4	0.00	0.00	0.00
XI	0	0	0.00	0.00	0.00
XII	5	25	87.86	7719.38	439.30
XIII	1	1	0.00	0.00	0.00
XIV	1	1	29.59	875.57	29.59
XV	0	0	0.00	0.00	0.00
XVI	3	9	78.24	6121.50	234.72
XVII	2	4	50.39	2539.15	100.78
XVIII	0	0	0.00	0.00	0.00
XIX	1	1	39.19	1535.86	39.19
XX	1	1	0.00	0.00	0.00
TOTAL	**43**	**169**	**808.02**	**55486.52**	**2812.55**

Table 5: Correlation Coefficient Between Teachers' Qualification and Students Failure in WASSCE

SCHOOL	GRADE POINT OF THE QUALIFICATION OF PHYSICS TEACHERS (X)	X^2	AVERAGE % FAILURE OF STUDENTS IN WASSCE (Y_2)	Y_2^2	XY_2	SS(X)	SS(Y_2)	SS(XY_2)	r(XY_2)
I	1	1	58.92	3471.57	58.92				
II	2	4	25.00	625.00	50				
III	5	25	29.59	875.57	147.95				
IV	1	1	57.84	3345.47	57.84				
V	4	16	33.47	1120.24	133.88				
VI	5	25	26.39	696.43	131.95				
VII	1	1	68.57	4701.84	68.57				
VIII	7	49	16.65	277.22	116.55				
IX	1	1	63.79	4069.16	63.79				
X	2	4	25.59	654.85	51.18				
XI	0	0	55.00	3025.00	0				
XII	5	25	17.78	316.13	88.9	76.55	9584.41	-463.61	-0.5413
XIII	1	1	24.96	623.00	24.96				
XIV	1	1	67.51	4557.60	67.51				
XV	0	0	0	0.00	0				
XVI	3	9	17.22	296.53	51.66				
XVII	2	4	48.21	2324.20	96.42				
XVIII	0	0	83.33	6943.89	0				
XIX	1	1	49.78	2478.05	49.78				
XX	1	1	59.85	3582.02	59.85				
TOTAL	**43**	**169**	**829.45**	**43983.78**	**1319.71**				

Table 6: Correlation Coefficient Between Teachers' Qualification and Students' Failure in NECO SSCE

SCHOOL	GRADE POINT OF THE QUALIFICATION OF PHYSICS TEACHERS (X)	X^2	AVERAGE % FAILURE OF STUDENTS IN NECO SSCE (Y_4)	Y_4^2	XY_4	SS(X)	SS(Y_4)	SS(XY_4)	r(XY_4)
I	1	1	45.80	2097.64	45.80				
II	2	4	29.44	866.71	58.88				
III	5	25	13.83	191.27	69.15				
IV	1	1	58.61	3435.13	58.61				
V	4	16	25.26	638.07	101.04				
VI	5	25	26.56	705.43	132.80				
VII	1	1	0.00	0.00	0.00				
VIII	7	49	14.50	210.25	101.50				
IX	1	1	63.25	4000.56	63.25				
X	2	4	0.00	0.00	0.00				
XI	0	0	0.00	0.00	0.00	76.55	11780.31	-70.307	-0.0740
XII	5	25	12.14	147.38	60.7				
XIII	1	1	0.00	0.00	0.00				
XIV	1	1	70.41	4957.57	70.41				
XV	0	0	0.00	0.00	0.00				
XVI	3	9	21.76	473.50	65.28				
XVII	2	4	49.61	2461.15	99.22				
XVIII	0	0	0.00	0.00	0.00				
XIX	1	1	60.81	3697.86	60.81				
XX	1	1	0.00	0.00	0.00				
TOTAL	**43**	**169**	**491.98**	**23882.52**	**987.45**				

IV. Discussion

From Table 1, there are a total of 23 physics teachers in the whole of the local government with an average of 1 physics teacher in a school. Three out of the twenty schools investigated has no physics teacher at all. 10 out of the 23 teachers have the least qualification which is about 43% of the entire physics teachers. These people do not have a Bachelor degree and as such are better suited for primary or junior secondary teaching. But due to lack of qualified teachers in the sciences, they are allowed to fill the gap and teach physics in the senior secondary schools. However, there are a few of the teachers with a Bachelor degree numbering up to seven while 5 teachers have a Masters degree. It was observed that only one physics teacher has a Doctorate in the schools investigated. The physics teachers enumerated are those who had educational background in physics.

In order to make up for the deficiency of physics teachers, it was observed that many of the schools resort to engaging young graduates who claim to know physics and are paid through the intervention of the Parents Teachers Association (PTA), a mere pittance which can barely sustain them. At other times, some of the schools engage the services of the Youth Corps members. This situation brings instability in the physics teaching and learning process as the contract teachers do not spend quality time with the school and the students before they leave.

From Table 2, there is an average of 595 students and 202 students who sat for WASSCE and NECO SSCE respectively within the three year period in the schools investigated. This implies that an average of 30 students registered for WASSCE within the three year period and an average of 10 students per year. For NECO SSCE, Seven out of the twenty schools investigated do not have enrollment in NECO SSCE exams for the three year period. There is therefore a relative lower number of enrollments of students in NECO SSCE examinations. Therefore an average of 16 students registered for NECO SSCE in each of the 13 schools for the three year period. The poor enrollment of students is because some of the students cannot afford to register for two external examinations the same year. Others consider it unimportant to write both NECO SSCE and WASSCE at the same time since WASSCE can serve both purposes when they pass.

The average percentage success from Table 2 within the three year period is 53.5% which is a little above average while the average percentage failure of students within the three year period is 46.5%. While it is commendable that the average percentage success of physics students is a little above 50%, it does not represent an excellent performance. There is therefore room for improvement in the teaching and learning of physics to make the students have an excellent performance.

Nonetheless, the success rate is higher in NECO SSCE than in WASSCE with an percentage success of 62%. This trend is attributable to the low enrollment which makes it easier for the teachers to prepare them well for the examinations. Since NECO SSCE is often written after WASSCE, the experience gathered while writing WASSCE serves as a guide and reinforcement to the students while writing NECO SSCE thus having a relatively higher success rate.

In some schools, they don't have students enrolling and sitting for both examinations. The level of enrollment of students in physics external examination is terribly poor compared to other subjects. This can be partly because of the insufficient number of teachers needed in teaching the subjects and the apparent difficulty of science subjects as perceived by the students. This situation is a pointer that the future of scientific and technological developments of the area and by extension, the entire country is in great danger.

From the analysis thus far, schools with more qualified teachers have higher success rate in their external examinations than schools with less qualified teachers. They also have high enrollment of students in such examinations. Conversely, schools with less qualified teachers produce students who do not relatively do well in external examinations. In a nut shell, highly qualified teachers relatively produce better students who do well in external examinations in Isaial-Ngwa North LGA. This findings corroborates the submissions in the works of [24, 32, 44 – 45].

V. Conclusion

This work looked into the qualifications of physics teachers and their impact on the performance of students in external examinations in Isiala-Ngwa North LGA of Abia state. The study considered 20 schools spread across the local government. Pearson Product moment correlation coefficient was used as a statistical approach to see the significant relationship between the two parameters. It was observed that there are less qualified teachers teaching physics in the secondary schools. The performance level of the students was considered for three years in two external examinations namely WASSCE and NECO SSCE. Furthermore, there is a significant relationship between teachers' qualification and students' performance in external examinations with a correlation coefficient of 0.74. Therefore, the higher the qualification of the teachers the higher the success level of the students in external examinations. Thus for a greater productivity, there is need for qualified teachers to be employed in our secondary schools to teach physics and other science subjects while regular training and retraining should be organized for those who are already teaching.

VI. Recommendations

Based on the study the following are recommended:

1. More qualified teachers should be employed to teach physics and other science subjects in our secondary schools
2. Constant training and retraining should be organized for physics teachers
3. The remuneration of physics teachers should be enhanced to enable them take care of themselves and have some to spare for further studies and research
4. Scholarships and grants should be given to physics and science teachers to go for higher degrees
5. Examinations bodies should periodically update schools with the requirements and expectations for a successful outing in their examinations. This includes revised curriculum, recommended texts and modern physics equipment for practical activities.
6. Laboratories and classrooms should be made available and conducive for the proper teaching and learning of physics while other teaching aids are to be provided for efficiency.

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