



Impact of Teachers Qualification and Teaching Workload on Mathematics Performance Among Senior Secondary School II Students in Kaduna State, Nigeria.

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Abstract

This study investigated the impact of teachers' qualification and teaching workload on mathematics performance among SSS2 students in Kaduna state, Nigeria. Ex-post facto research design was adopted. The study used SSS2 students in Kaduna with population of 42,121 students. In order to ensure that each school had an equal chance of being chosen, a simple random sampling technique was employed where 450 students were randomly selected as sample size. Two research instruments: Mathematics Performance Test (MPT) and Teaching Facilities Inventory (TFI) was used. These instruments were validated and reliability coefficient estimated as $r=0.93$ and $r=0.86$ respectively. Findings indicated that there were significant differences in the performance of students taught by graduates with education qualification and also there were significant differences in the performance of students whose teachers have appropriate workload and those overloaded. The study concluded that, education qualification should be mandatory requirement for teaching mathematics in secondary schools with appropriate workload for teachers.

Keywords: Teachers Qualification, Teaching Workload, Mathematics and Performance

Introduction

The mastery of a subject is determined by the performance of the students in such a subject at a prescribed examination. Any interactive activity between a teacher and the students is expected to produce learning outcomes in the learners. When such an activity failed to produce a change in behaviour (learning) in the learners, then, there is a problem. The performance of students in mathematics generally is a major concern to mathematics educators. Aghyenuku in Sakiyo and Sofeme (2008) noted that students' performance in science subjects is low in both national and state examinations. A number of reasons can be identified to be accountable for the low performance of students in sciences. These include the subject curricula, teachers' qualification, experience, teachers' methods of teaching, parents, government, lack of facilities and others (Ahiakwo, 2003). According to Owolabi (2007), students' low performance in mathematics globally is basically due to lack of involving the students in the teaching learning activities right from the beginning of any new concept to be taught, lack of qualified teachers as well as experiences in teaching and unavailability of teaching materials. The teachers are the facilitators who are to impact into the students the concepts expected to be learnt. When considering growth in technology, the development of human capital is paramount (Fajonyomi, 2007). The teacher is the major manpower saddled with the responsibility of impacting the concepts considered

fundamental to technology through the teaching of these basic concepts from the secondary school. This was why Stuart (2004) noted that a country's manpower development depends on the quantity of her well-qualified teachers. Laudable objectives of the nation would not be realized when the students are taught by incompetent teachers. Such teachers would not be able to properly and adequately disseminate the concepts to the students. The competence of the mathematics teachers in this regard would be of immeasurable value. A professional teacher would be desirable in this regard. The issue of professionalism in teaching has been on course for quite some decades ago. Scholars argued the necessity of skilled teachers for effective learning. Ngada in Fajonyomi (2007) emphasized that the success or failure of any educational programme rests majorly on the adequate availability of qualified (professional), competent and dedicated teachers. Seweje and Jegede (2005) noted that the ability of a teacher to teach is not derived only from one's academic background but it is based upon outstanding pedagogical skill acquired. This view is supported by Nkwodimah's (2003) submission that the teacher's quality will inevitably be seen in the citizens tomorrow. Okebukola in Ngada (2008), while remarking on teachers' quality, observed that over 80% of respondents in survey research were of the view that teachers are carriers of weaknesses. These weaknesses include, among others, inadequate exposure to teaching Practice, Poor classroom



management and control, Shallow subject-matter and Lack of professionalism. From Ajayi's (2009) point of view, the professional qualities of a teacher have to do with the following: Mastery of the subject matter, Ability to involve the students in meaningful activities throughout the period of teaching, etc.

The availability of professional teachers in our schools is low (Ngada, 2008). The reasons may not be farfetched. Teaching is seen as a dumping ground for any unemployed school leavers, irrespective of their area of specialization. This group of able-bodied young men and women thus handle the job as a by-pass venture to their desired ends. Consequently, their input on the job would be very low since it lacks the passion and dedication demanded by the job. The few ones that seem to show little dedication lack the technical knowhow of teaching since they were never trained on the job. The major evil done by this is half-baked and shallow-knowledge students who often perform poorly in their examinations. This eventually culminates to a decline in the national technological growth. The Federal Ministry of Education (2013) emphasizing the National Policy on Education stipulated that secondary education is an instrument for National development that fosters the worth and development of the individual for further education, general development of the society and equality of educational opportunities to all Nigerian children, irrespective of any real or marginal disabilities. The role of secondary education is to lay the foundation for further education and if a good foundation is laid at this level, there is likely to be fewer problems at subsequent levels. Though the subject was made compulsory for students but the performance of these students is not encouraging after all. Unfortunately, the results of some previous studies on students' performance in mathematics have been full of apathy showing the sorry state of affairs surrounding mathematics in the country (Ibrahim, 2000 & Danesty 2004). Over the past decades, educational planners, policy makers and administrators all over the world had become increasingly concerned about the quality of education provided by the school system. They have come to realize that many meaningful improvements in the quality of education that students receive are highly dependent on the quality of teachers (Anderson in Lambaya, 2016). One of the main components of a well-designed educational curriculum is assessment of students' performance on the set objectives as well as analyzing the factors that affect the performance. According to George (2006),

most of the mathematics teachers at the government-owned secondary schools in Nigeria have low qualifications and this has tremendous negative consequences on the students' performance. Teachers' qualification on the subject matter they teach has attracted increasing attention from policymakers (Fajonyomi, 2007).

Statement of the Problem

Mathematics plays an important role in science and technology which results in development of our society. It is a compulsory subject to all students at all levels of secondary school education. The main purpose of mathematics education programme in various institutions of learning in Nigeria is to make students understand mathematics and apply it to everyday activities which are in line with the objectives of the Federal Government of Nigeria as stipulated in the National Policy on Education (FGN, 2013). There is high rate of poor achievement of students in mathematics in the senior secondary school examination with more students scoring less than 40% as reported by Mathematics Chief Examiners of WAEC (2018), that 69% of students' who sat for the West African Examination Council failed both Mathematics and English. This may not be unconnected to the lack of qualified teachers and teachers with overload of teaching work. It is against this background that the researcher investigated impact of teachers' qualification and teaching workload on mathematics performance among SSS2 students in Kaduna State, Nigeria.

Objectives of the Study

The objectives of this study were to:

1. determine the impact of teachers' qualifications on students' performance in senior secondary school mathematics,
2. assess the impact of mathematics teachers' workload on students' performance in senior secondary school.

Research Questions

This study used the following questions which guided the conduct of the study:

1. What is the impact of teachers' qualification on students' performance in senior secondary school mathematics in Kaduna state?
2. To what extent does mathematics teachers' workload have impact on academic achievement of senior secondary school students in Kaduna state?



Hypotheses

The following null hypotheses were stated and tested at $p \leq 0.05$ level of significance.

H₀₁: There is no significant difference in the performance of students taught by teachers with education qualification and those taught by teachers with different qualifications in senior secondary school mathematics.

H₀₂: There is no significant difference between the performances of students taught by teachers with appropriate workload and those with overload.

Methodology

The design for the study was an ex-post facto research design. The teachers are grouped based on their qualifications (B. sc., B. Eng, B. Tech, B. Ed and Others) that involved the determination and description of the impact of teaching qualification on students' academic performance. It investigated the facts as they involve how teachers' qualification and workloads affect students' academic performance in schools. Mathematics Performance Test (MPT) and Teaching Facilities Inventory (TFI) was developed and administered to 450 sampled students in accordance with Central Limit Theorem that regarded a minimum of 30 sample size viable for research, drawn from 42,121 population of senior secondary schools' II students in Kaduna State. The instruments (MPT) were validated by three experts and its reliability coefficient was established as 0.93 using test-retest method. The sampled students were taught for a period of six weeks. The experimental group was retested after been taught by teachers with education qualification. Data for the research

questions were analyzed using descriptive statistics of means and standard deviation, while the null hypotheses formulated were tested at 0.05 level of significant using t-test Statistical tool

Results

This section presents the results of the data analysis. It was carried out under descriptive analysis and testing of hypothesis.

Table 1 shows the means and the standard deviations of students' scores taught by teachers with and those without education qualification. It shows that the mean and the standard deviation of students' scores taught by teachers with education qualification were: 51.23 and 1.90 respectively. It also shows that the mean and standard deviation of students' scores taught by teachers without education qualification are: 41.62 and 2.10 respectively. It clearly shows that the two mean scores are different.

Table 2 shows the means and the standard deviations of students' scores taught by teachers with appropriate workload (i.e School with required number of periods per-teacher). It shows that the mean and the standard deviation are: 49.79 and 5.21 respectively. It also shows that the mean and the standard deviation of students' scores taught by teachers with overload (i.e School that have more than required number of students per-class and periods) are: 44.51 and 5.10 respectively. It clearly shows that the two mean scores are different.

Hypotheses Testing: t-test of independent variables was used to find out whether there exist differences in the performance of students as stated in table 1.

Table 1: t-test between different Teachers Qualifications and Students Achievement

Variable	N	X score	SD	Std Error	t-Value	DF	p-value	Decision
Teachers with Education Qualification	8	51.23	1.90	0.67	9.24	13	0.001	Sign.
Teachers without Education Qualification	7	41.62	2.10	0.79				

N= number of schools with teachers with and without education qualification.

The table indicates that Standard Error of students taught by teachers with education qualification was: 0.67. While the Standard Error of students taught by teachers without education qualification was 0.79 which indicate a variation in the students' performance. Also, the t-value is 9.24 and the Degree of Freedom 13, with p-value $0.001 < 0.05$ level of significance. Therefore, the null hypothesis, which

state that: There is no significant difference in the performance of students taught by teachers with education qualification and those taught by teachers with different qualifications, was therefore rejected. Hence, there exist a significant difference in the performance of students taught by teachers with education qualification and those taught by teachers with different qualifications.

Table 2: Teachers Workload and Students Academic Achievement.

Variable	N	X score	SD	Std Error	t-Value	DF	p-value	Decision
Appropriately loaded	5	51.94	1.96	0.88	4.69	13	0.001	Sign.
Overloaded	10	44.17	4.44	1.40				

The table indicates that the Standard Error of teachers with appropriate workload was 0.88. While the Standard Error of teachers with overload was 1.4. These indicate a variation in their performance. Also, the t-value is 4.69 and the Degree of Freedom 13, with p-value $0.001 < 0.05$ level of significance. Therefore, the null hypothesis, which state that: There is no significant difference between the performances of students’ whose teachers have appropriate workload and those who are overloaded, was therefore rejected. Hence, there exists a significant difference between performance of students whose teachers have appropriate load and those taught by teachers with work overload.

Discussions

The main objective of the study was to investigate on the impact of teachers’ qualifications and workload of mathematics teacher on students’ performance in senior secondary school in Kaduna state, Nigeria. Results obtained from the first study showed that teachers’ qualifications have influence on students’ performance. The finding is in agreement with that of Goldhaber and Brewer (2002), who found out that students do better in mathematics if taught by a teacher with a bachelor’s or master’s degree in mathematics especially mathematics education. The second finding of this study showed that differences in the performance of students’ whose teachers are appropriately loaded than those who are overloaded is quite high. The difference could be as a result of the ability of the teacher having sufficient time to study ahead and properly design an effective lesson plan for efficient lesson delivery. The finding agrees with Nwikina and Nwanekezi cited in Lambaya (2016) who concluded that teachers’ workload was one of the factors that inhibited students’ academic performance. This reveals that there is inadequate number of mathematics teachers in our secondary schools, there by affecting the teachers’ output.

Conclusion

The findings of this study led to the conclusions as explained below, Teachers’ qualifications have significant influence on students’ performance. The students’ taught by graduates with education qualification performed significantly better than those taught by teachers without education qualification due to their ability to engage various teaching methodology into effective lesson delivery. The students’ taught by teachers with appropriately teaching load performed significantly better than those taught by teachers with inappropriately workload, therefore appropriate workload give room for teachers to study ahead and properly design an effective lesson plan for efficient lesson delivery.

Recommendations

In this study, some recommendations were made based on the findings and conclusions. Ministry of education should arrange a certified mass training for teachers without education certificate at a subsidized rate where they can be taught strategies of effective lesson delivery. Quality assurance supervisors should ensure that mathematics teachers are given appropriate workload to enable them study ahead and properly design an effective lesson plan for efficient lesson delivery.

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