EVALUATION OF TEACHER-STUDENT RATIO IN MATHEMATICS IN PUBLIC AND PRIVATE SECONDARY SCHOOLS IN OYO METROPOLIS

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Abstract
Finding lasting solutions to the poor performance of students in Mathematics, being a compulsory subject that is dreaded by many, cannot be over flogged. Unrelenting researchers in Mathematics education strive to find out how students' achievement in the subject could be improved. It is with this that the paper investigated the Mathematics teacher/students' ratio in both the private and public secondary schools in Oyo metropolis with a view to discussing the educational implications of the ratio on the students' performance in the subject. The target population is all secondary schools in Oyo state. A purposive sample of all public secondary school students and teachers of Mathematics in Afijio, Atiba, Oyo East and Oyo West Local Government Areas (LGAs) and four private secondary schools each, from the stated four LGAs were involved. The data on the number of students and Mathematics teachers were sourced from the Teaching Service Commission (TESCOM) in each of the LGA. Ratio of Mathematics teacher to students was calculated and analysed. It was found that the ratio was higher in public (1:237) than private (1:92) secondary schools in the sampled local government areas. It is thus recommended that government should employ more qualified Mathematics teachers to public schools so as to reduce the high teacher/student ratio to about 1:100 for better performance of students in Mathematics.

Introduction

Mathematics is one of the subjects recognised as playing a major role in the overall development of any nation. Due to the importance attached to the subject, it is made compulsory (core subject) in the curriculum of secondary schools. Secondary schools not only occupy a strategic place in the educational system in Nigeria, it is also the link between the primary and the university levels of education (Ajani & Akinyele, 2014). The pivotal position of Mathematics to national development has resulted in the educational policy makers' resolve to position mathematics as a compulsory subject for admission and even employment purposes (Kolawole & Ajetunmobi, 2014). Ayeni (2012) opines that Mathematics enhances the ability to reason correctly. Whenever a theorem is formulated, its proof must be based on the hypotheses. This is why in the developed countries, the national security agencies are the largest single employers of Mathematicians. There is therefore a widespread interest among industrialised countries at improving the levels of Mathematics achievement in schools. Nwokocha and Amadike, in Ajani and Akinyele (2014), assert that academic performance of students is the yardstick for testing educational quality of a nation.

Hence, it is expedient to maintain a high performance in internal and mostly external examinations.

In the early weeks of the first term of the 2016/2017 academic session, there were unrests in public secondary schools in Oyo State when government directed that students who were unable to score 50% in both English Language and Mathematics during the third term of 2015/2016 academic session internal examination would not be promoted to the next class. This directive looked strange to the students and most of them were not promoted. In some schools, as high as 95% of the students were not promoted. This made the students to go on rampage, started throwing stones, destroying the school properties, burning down classrooms, beating their teachers, among others. This even affected the JS III students who sat for 2015/2016 Basic Education Certificate Examination (BECE). They were also asked to repeat JS III for failing to obtain credit grade in both English Language and Mathematics. The question is that who is responsible for the mass failure in English Language and Mathematics among secondary school students? What are the parents, teachers, governments or students' contributions to this phenomenon? What could the state government do to enhance students' performance in Mathematics?

Finding lasting solutions to the poor performance of students in Mathematics, being a compulsory subject that is dreaded by many cannot be over flogged. Unrelenting researchers in Mathematics education strive to find out how students' achievement in the subject could be improved and how Mathematics could be learnt with ease. (Kankia, 2008; Farayola, 2012; Gbolagade, 2012; Ali, 2013; Suan, 2014) It is a known fact that Mathematics is perceived as a difficult subject. If not that the subject is made compulsory for admission purpose, large number of students would have turned down offering it as a result of the difficulty encountered by the students (Ayeni, 2012).

People's perception and beliefs about Mathematics originate from past experiences comprising both cognitive and affective dimensions. From cognitive point of view, it relates to a person's knowledge as well as beliefs while affective domain is referred to as a person's attitudes, feelings and emotion about Mathematics (Susan, 2014). Mathematics is known as a subject that affects all aspects of human life at different levels. It is seen by society as the foundation of scientific/technological knowledge that is vital in social-economic development of a nation. The secondary school level is supposed to be the foundation towards higher knowledge in higher institutions of learning, it is an instrument that can be used to achieve economic, social, scientific, technological, political and cultural development in a country. We cannot but emphasize and investigate secondary school Mathematics. Researchers identified factors contributing to the performance of students both in internal and external examinations in Mathematics to include methods of teaching (Farayola, 2012), overcrowded classes (Kankia, 2008), lack of motivation for teachers (Adaramola & Adeyemi, 2014), teachers' ineffectiveness, poor funding, low self-concept, student-teacher relationship and poor examination condition (Ali, 2013).

The student-teacher ratio expresses the relationship between the numbers of students enrolled in a school per teacher. Student-teacher ratio is the number of students who attend a school divided by the

number of teachers in the school. For example, a student-teacher ratio of 10:1 indicates that there are 10 students for every teacher. It must be noted that students-teacher ratio is not the same thing as class size. Heros (2001) in Ikediashi and Amaechi (2012), asserts that pupil-teacher achievement ratio study, class size and pupil-teacher ratio are not the same and that arguments using these two terms as synonyms are flawed. Class size is the number of children in a teacher's room daily for whom the teacher is accountable while the pupil-teacher ratio is generated by dividing the number of pupils in one school by all educators including administrators, counsellors, special teachers and other adults who serve in the school. Ikediashi and Amaechi (2012) assert that pupil-teacher ratios are very essential to quality of education. Pupil-teacher ratios perhaps rank along-side professional knowledge, skills, as well as strategies, in genuinely determining educational success and performance. Class size reduction, to have students' performance improved is a technique that has been tried, debated and analysed for years. The basis looks logical since with fewer students to teach, teachers can coax better performance from each of them. Emmanuel (2013) concluded that the smaller the student-teacher ratio, the better the quality of education of both high and low intelligent students.

Statement of the Problem

The problem of students-teacher ratio in secondary schools cannot be overstressed. Many studies have pointed out the significance of teacher-students ratio to cognitive learning in the school. A low ratio allows for effective communication between the teacher and the student. It guarantees individualised attention from the teacher. The fact that Mathematics is compulsory for all students in the post primary schools calls for adequate number of qualified and competent teachers to handle the subject in order to raise the level of students' achievement in Mathematics examination. It is with this backdrop that this paper examined the Mathematics teacher to students' ratios in both the public and private schools in Oyo metropolis and the possible implications of the ratio on the performance of the students in Mathematics.

Objectives of the study

The aim of this paper is to appraise the number of students attending secondary schools in Oyo metropolis viz-a-vis the available teachers to teach the students Mathematics.

The specific objectives of the study are to:

1. establish Mathematics teacher-students ratio in secondary schools in Oyo metropolis; and,
2. discuss possible effects of these ratios on students' performance in Mathematics.

Research Questions

The following research questions were raised to guide the study.

1. What is Mathematics teacher - students' ratio in secondary schools in Oyo metropolis?
2. What are the implications of the ratios on students' performance in Mathematics?

Purpose of the Study

The main purpose of this research work is to relate the Mathematics teacher-students ratio to the academic performance

of students in Mathematics in both public and private secondary schools in Oyo metropolis.

Population of the Study

The study population comprises all secondary school students in Oyo metropolis, that is, Afijio, Atiba, Oyo East and Oyo West LGAs as well as four (4) private schools from each of the four LGAs. There are presently 64 public secondary schools within the four LGAs in Oyo metropolis with 149 Mathematics teachers and 35,324 students (Field work, 2016).

Sample and Sampling Technique

The study involves an intact group of all public secondary school Mathematics teachers and students as well as purposively sampled Mathematics teachers and students from four (4) private secondary schools each, from each of the four LGAs.

Methodology

To achieve the purpose of this study, the researcher collected relevant information from the Teaching Service Commission (TESCOM) in Oyo metropolis on the number and names of secondary schools in each local government area within Oyo environs as well as number of students and Mathematics teachers available in all the schools.

Instrument

The research instrument adopted for the collection of data is an inventory on schools in the local governments. It consists of names of schools in each local government, number of Mathematics teachers as well as total number of students in each school. The first four private schools that has highest student enrolment and has presented students for WASSCE in each of the local government areas were purposively chosen for the study.

Results and Discussion of Findings

Table 1: *Mathematics Teacher - Students' Ratio in Public Secondary Schools in Oyo Metropolis.*

	Local Government Area	Status of school	Number of schools	Number of students	Number of mathematics teachers	Ratio of teacher to students	Expected number of teachers at 30 students per teacher	Expected number of teachers at 100 students per teacher
1.	Afijio	Urban	11	5,709	23	1:248	190	57
		Rural	6	899	4	1:225	30	9
2.	Atiba	Urban	12	10,442	38	1:275	348	104
		Rural	13	183	3	1:61	6	2
3.	Oyo East	Urban	10	10,553	44	1:240	352	105
		Rural	1	857	5	1:171	28	9
4.	Oyo West	Urban	9	6,449	31	1:208	215	65
		Rural	2	232	1	1:232	8	3
Total			**64**	**35,324**	**149**	**1:237**	**1,241**	**354**

Source: *TESCOM School Boards of Afijio, Atiba, Oyo East and Oyo West LGAs between November 3, 2016 and November 10, 2016.*

Table 2:
Mathematics Teacher-Students' Ratio in Private Secondary Schools in Oyo Metropolis.

S/No	Local Government	Status of school	Number of schools	Number of students	Number of mathematics teacher	Ratio of teacher to students	Expected number of teachers at 30 students per teacher	Expected number of teachers at 100 students per teacher
1.	Afijio	Urban	4	1,891	15	1:126	63	19
		Rural	Nil	-	-	-	-	-
2.	Atiba	Urban	4	1,825	20	1:9	61	18
		Rural	Nil	-	-	-	-	-
3.	Oyo East	Urban	4	1,261	20	1:63	42	13
		Rural	Nil	-	-	-	-	-
4.	Oyo West	Urban	4	1,640	17	1:94	54	16
		Rural	Nil	-	-	-	-	-
Total				6,617	72	**1:92**	**220**	**66**

Source: *2016 field work*

Research Question 1: What is the Mathematics teacher-students ratio in secondary schools in Oyo metropolis?

Table 1 shows the Mathematics teacher-students ratio in public secondary schools in Oyo metropolis. In all, there were 35,324 students with 149 teachers teaching them. This gives a ratio of 1 Mathematics teacher to 237 students. This ratio is grossly inadequate and this implied a very minimal student-teacher interaction. (In primary schools, UNESCO recommended a teacher-pupil ratio of 1:30).

Column 7 of Table 1 presents the ratios of Mathematics teachers to students in both urban and rural schools in each of the local government areas. A critical examination of the ratios shows that rural schools in Atiba LGA has the lowest students–teacher ratio of 61:1 and also the highest ratio of 275 students to 1 Mathematics teacher in urban schools within the same the local government area. With these ratios, hardly would one expects any good result from students both in their internal and external examinations. Little wonder the students took to streets during the early weeks of the 2016/2017 first term in Oyo metropolis. This implies that the problem of mass failure in Mathematics cannot be totally ascribed to the students' fault. Ajani and Akinyele (2014) reported that there was a significant relationship between student's perception of student-teacher ratio and academic achievement in Mathematics. Bayo (2005) also opines that smaller classes benefit all pupils because there are individual attention from teachers. These findings supported the belief of parents engaging teachers on one-on-one lesson for their wards.

Ajani and Akinyele (2014) observed that the pupil/teachers ratio is an indication of the education quality. One can say that a lower Mathematics teacher/students ratio

will also be an indication for quality Mathematics lesson delivery. But in a situation where a Mathematics teacher have to care for more than 200 students, as indicated in Table 1, he cannot discharge his duties effectively, hence poor students' results in Mathematics. Ikediashi and Amaechi (2012) listed number of pupils per classroom, impact of pupils' intellectual ability, teacher's quality, the influence of motivation both for students and teachers as some of the factors influencing quality education. He concluded that the lower the teacher-pupil ratio is, the better the educational quality of the pupils involved.

Table 2 indicates that Mathematics teacher–student ratio is far lower than what is obtained in public secondary schools in Oyo metropolis. The data indicated the reason why students' performance in Mathematics in private secondary schools is better than those in the public secondary schools. Using the Mathematics teacher/student ratio of 1:30, column 8 in Tables 1 & 2 gives number of expected Mathematics teachers in each of the local government areas both in public and private schools. Column 9 in the tables gives the number of expected Mathematics teachers in each of the local government areas both in public and private schools based on Mathematics teacher/student ratio of 1:100. Comparing the respective columns 6, 8 and 9 in Tables 1 & 2, it is observed that private schools had low teacher/student ratio. Little wonder the private schools use this low teacher/student ratio to advertise their schools. They employ adequate number of Mathematics and English language teachers, knowing fully well that the results of students in these two subjects tell much about the going-concern of their schools. Hence, they cannot but employ good teachers and put in good monitoring mechanism which Bonsu (2016) asserts was lacking in public schools. He stressed that private schools were better resourced, had parents of pupils whose socio-economic status was higher and were more involved in their children's education.

Research Question 2: What are the implications of the ratio on students' performance in Mathematics?

Stakeholders in Mathematics education would continue to search for solutions to the problems of students' poor performance in Mathematics. Reasons for students' not-too-good performance in Mathematics have been given, among others, as school environment, teacher qualification and student-teacher ratio. It is advocated that the lower the student-teacher ratio, the better, though this condition is not in isolation of the other factors affecting students' performance in academics. (Ikediashi & Amaechi, 2012).

Personal experience with students from parents whose socio-economic status was higher showed that they, in addition to normal school class engage Mathematics teachers in private lessons with their children/wards. The most common among such arrangement is one-on-one lesson, that is, a Mathematics teacher to a student, often than not, in a conducive atmosphere at the parent's house. Parents testified to this that such arrangement had assisted their wards to perform excellently well in the subject. Going by this, one can infer that having all other factors affecting students' performance in Mathematics in place, a low

teacher/student ratio would add unthinkable value to students' performance in the subject.

Furthermore, since professionalism is at play in any profession, the World Health Organisation (WHO), according to Ogundipe, Obinna and Olawale (2015), recommends 1 nurse to a population ratio of 700 and 1 doctor to a population ratio of 400. This, if done will not only guarantee healthy living but also a long life span and better economy. But in 2014, Nigeria had less than 150,000 registered nurses to cater for an estimated 160 million population, giving an average nurse population ratio of 1 to 1,066 people and an average doctor:patient ratio of 1:53,333. The shortage of these medical personnel made Ogundipe, Obinna and Olawale (2015) to cry out that tougher times lie ahead for Nigerians. If this is so in health sector, the education sector cannot be left unattended to. Hence, the need to have ideal teacher – student ratio for good student performance in Mathematics.

Conclusion

In this paper, it was established that the Mathematics teacher–student ratio was higher in the public than in the private secondary schools in Oyo metropolis. The yard stick of one Mathematics teacher to 100 students is observed to be practised in most of the private schools under the study. This could be adduced as one of the reasons for better performance of students in Mathematics in private schools in Oyo metropolis.

Recommendations

The following recommendations are made based on the findings of the study.

Government should employ more qualified Mathematics teachers to various public schools in Oyo metropolis so as to have lower Mathematics teacher-student ratio. A ratio of at most one Mathematics teacher to one hundred students would, to a great extent, improve the quality of Mathematics teaching and hence, improve students' performance in the subject.

The school authorities and all stakeholders in Mathematics education should monitor Mathematics teachers thoroughly so that they would attend to their students regularly, give and mark assignments, and do necessary corrections for the students.

Since it has been observed that smaller class size improves students' learning, parents should engage the services of lesson teachers on one-on-one teaching of their wards for improved performance in the subject.

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