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Causes and Remedies of Mathematics and Science Teachers Turnover in Nigeria

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ABSTRACT
The study examined the causes of mathematics and science teachers' turnover and proffered remedies to curb such malady. A sample of 365 teachers, selected from 12 schools (4 from each of the three Senatorial Districts) in Rivers State, was used for the study. A self–designed questionnaire titled "Teachers Turnover Questionnaire (TTQ)" with a reliability coefficient of 0.86 was used to gather data for the study which was analysed using means, standard deviations, and one-way analysis of variance. It was found that irregular payment of teachers' salaries, low wages, poor society image, poor work environment, enormous workload (high student-teacher ratio), and lack of incentives were strong determinants of mathematics and science teachers turnover. It was recommended that remedies for mathematics and science teachers turnover include teachers' wages should be higher than the wages of all other professions (the teacher created them), salaries should be paid regularly and promptly, teachers' work environment should be equivalent or equal to that of Shell or bank workers, car and housing loans should be extended to teachers, and that when all these are in place, the poor society image of teachers will be non-existent.
Keywords: Teacher turnover, mathematics and science teachers, low wages, salary, workload, incentives.

INTRODUCTION

Teachers constitute the fulcrum on which the entire education system rotates. Consequently, teachers are at the hub of the development of any nation as no nation can develop beyond the level of its education. Thus, the shortage of teachers in any education system spells great doom for such system. For a developing nation like Nigeria, adequate supply of mathematics and science teachers should be given. Regrettably, the reverse is the num in Nigeria. The challenge of inadequate staffing of the nation's classrooms with qualified mathematics and science teachers is a threat to functional education and development (Adeyemi, 2011). There are a number of competing explanations concerning the sources of, and solutions to, these mathematics and science staffing problems. One of the most prominent explanations is the problem of insufficient production and supply of mathematics and science teachers in the face of increasing student enrolments and increasing teacher turnover (U.S. Department of Education, 2002). This situation causes many school systems to lower standards in order to fill teacher shortfalls leading to high levels of under-qualified mathematics and science teachers, with the effect of poor students' performance.

The prevailing policy response to teacher shortages has been to attempt to increase the supply of teachers (Darling-Hammond, 2007; Fowler, 2008; Rice, Roellke, Sparks, & Kolbe, 2008), without any attempt to entice or attract persons to remain in the teaching profession. In the past, teachers were recruited from overseas: Ghana, India, Pakistan, and many other foreign countries to solve the mathematics and science teacher shortage problem. Still in the past, prospective teachers, especially in mathematics and science had their tuition and other costs of education borne by federal, regional or state government (this researcher is a beneficiary). In contrast to this historical focus on understanding the factors that attract

individuals to teaching and the means to recruit new candidates into the teaching profession, there has been relatively less attention paid to the training and recruitment of teachers, and the role of teachers in nation building (Ingersoll, 2001; Rice et al., 2008). Today, apart from the fact that teachers bear entirely the cost of their education, their salaries are often not paid when due, promotion is an illusion (and if promoted at all, teachers remain at the same salary grade levels as before promotion), and in-service training is a mere policy statement - traumatic and humiliating conditions that cause many teachers to change their jobs (increasing teacher turnover) or lack commitment if still a teacher, all of which lower students' performance.

However, Kimmitt (2007) opined that some degree of employee turnover and career change is normal and sometimes inevitable, and can be efficacious for individuals, organizations, and the entire economic system. On the other hand, theory and research on employee turnover have also held that employee turnover can be both the cause and effect of problems in organizations (Price, 1989). From this perspective, employee turnover is of concern not only because it may be a symptom of underlying problems in how well organizations function but also because departures can entail costs for organizations and for the larger system (Ingersoll & May, 2012). In contrast to the industrial and corporate sectors, teacher turnover (particularly, mathematics and science teachers turnover) is a great disservice to education. In Nigeria, the consequences of mathematics and science teacher turnover have been largely negative on learners, teachers, school administrators, and policy makers (Subair & Talabi, 2015). These consequences range from loss of human capital, investments in employee development, the costs of replacement, hiring, and training of teachers, to disruption of production processes (disruption of classes and examinations).

Several efforts have been explored, and attempts made at understanding the determinants, predictors, and sources of teacher turnover with a view to proffering solutions (Borman & Dowling, 2008; Ingersoll & Perda, 2012). But the problems of teacher turnover and shortage in mathematics and science still persist. Among the findings is that teacher turnover is related to the teaching field. Specifically, special education, mathematics, and science were found as the fields with the highest teacher turnover (Ingersoll, 2006; Keesler, 2010). They further found that mathematics and science teachers are more likely to leave to other jobs at higher rates because they have more alternative career options in the business and technological sectors, often with higher salaries, than teachers in other fields. In other words, low wages increase mathematics and science teachers' turnover. Today in Nigeria, poor remuneration of teachers (wages lower than those of other professions the teaching profession created) has turned the teaching profession which used to be the envy of all, to a profession of mockery, which youths are sceptical to go into. Students no longer choose education as a first course of study; they only go there when everything else has failed.

According to Kamoh, Ughili, and Abada (2013), other factors that determine teacher turnover include irregular payment of salaries, poor work environment, poor society image, lack of incentives, and lack of advancement opportunities. Ayeni (2005) found that school principals lamented that teachers are not willing to work and many are leaving because of irregularity and delays in payment of their salaries, adding that nobody would be willing to work while his family is starving at home. Prompt payment of salaries is loved by every worker; in fact it is basically for salary that people work. Otherwise, people would just go about cleaning the cities for free, cutting the bushes for nothing, digging the ground and covering them up. People work for wages. This is why *The Holy Bible* in Matthew 10/10 emphasizes that the labourer must be paid his wages. No doubt a few persons may work for charity, but all others who work to earn a living should be paid their wages and promptly too. Ubom (2002) found that in Nigeria, prompt payment of salaries induced greater commitment to teaching. Delay in payment, and sometimes non-payment of salaries are at the base of the decline in the choice of teaching as a career in Nigeria. A peep into the Faculty of Education of the Rivers State University revealed that 10 years running only . . . graduated in Mathematics Education with . . . (post-graduate). Who would want to go through the rigours of mathematics and science only to be hired without salary when opportunities abound outside teaching? Lack of satisfaction in the teaching profession is bad news for children and

their academic achievement. Morgan and O'Leary (2004) noted that when teachers feel good about their work, learners' achievement improves.

Teachers' image in Nigeria is at an unacceptably low level which is the direct opposite of what it used to be in the 1970s and earlier. In the past, teachers were respected, honoured, and placed above all other professions (which, of course, were created by the teacher). Then, people were proud to study Education in the higher institution; their salaries were good and paid promptly. The teacher was the cynosure of all eyes. But not any more: today, the teacher's salary is low, irregular, delayed, and sometimes not paid at all, parents refuse their daughters to marry teachers, and many more. According to Baike (2002), the social status of teachers has been identified as an important factor impacting teacher's morale and motivation, and consequently, the performance of students.

Kamoh, Ughili, and Abada (2013) found that poor incentives to teachers are associated with teacher turnover. Although teachers are civil servants, they are not treated as one. For instance,

civil servants in Nigeria, but not teachers, are entitled to various fringe benefits: housing loan, car loan, motorcycle loan, free medical services, early payment of pension and gratuity, and many more. When teachers are this discriminated, teachers who have opportunities outside teaching would definitely go. Specifically, special education, mathematics, and science were found as the fields with the highest teacher turnover (Keesler, 2010). The implication is that when benefits are denied teachers, mathematics and science teachers are the ones to leave most.

The work environment is also a determinant of teacher turnover and motivation. The teachers' work environment in Nigeria has been described as the most impoverished of all sectors of the labour force with the facilities in most schools dilapidated and inadequate (Adelabu, 2003). Some teachers, especially in public schools do not have tables to write on and/or chairs to sit on. Sometimes, classes are held under the trees with all the weather hazards impacting on the teachers and learners. Meanwhile the teachers' counterparts in the ministries and other sectors of the economy have air conditioners, beautiful tables and chairs, fridges, and are even served tea/coffee during break. The question is: how would any teacher who finds a place in any of the alternate offices remain in teaching? As noted earlier, those in the fields of mathematics and science are very much sought after and so have the highest teacher turnover (Keesler, 2010).

Enormous workload resulting from high teacher-pupil ratio is another determinant of teacher turnover. Although the Federal Republic of Nigeria (2013) has stipulated the following teacher-pupil ratio: Creche (1:10); Nursery (1:25); Primary (1:35); Junior Secondary School (1:35); Senior Secondary School (1:40); and Technical Colleges (1:20), it is quite unfortunate that this policy is not enforced at all levels of education in Nigeria. Moja (2000) emphasized that despite the teacher-pupil ratio of 1:40 at the Senior Secondary School level, prescribed by the National Policy on Education, most classrooms are overcrowded and in some instances schools have operated with teacher-pupil ratios of 1:76. In respect of this research, visits to some of the schools where teachers were interviewed and questionnaire administered revealed that some schools had teacher-pupil ratios as high as 1:120. Apart from the fact that teachers would find classroom management grossly ineffective in such schools, scoring of assignments and tests for prompt feedback would be illusory. For mathematics and science teachers who are often in short supply and who have to teacher 3 to 5 different classes or different arms of the same class, the ratio could be as high as 1:360, 1:480, and so on. This level of workload would enhance teacher turnover.

Statement of the Problem

Special education, mathematics, and science were found as the fields with the highest teacher turnover (Ingersoll, 2006; Keesler, 2010). They further found that mathematics and science teachers are more likely to leave to other jobs at higher rates because they have more alternative career options in the business and technological sectors than teachers in other fields. The challenges are: What are the reasons for mathematics and science teacher turnover and what can be done to curb them? This study was carried out to provide valid and reliable determinants of mathematics and science teacher turnover and make informed recommendations for ameliorative strategies.

Research Questions

1. To what extent does irregular payment of teachers' salaries influence the turnover of teachers?
2. To what extent do low wages influence the turnover of teachers?
3. To what extent does poor society image influence the turnover of teachers?
4. To what extent does poor work environment influence the turnover of teachers?
5. To what extent does workload (high student-teacher ratio) influence the turnover of teachers?
6. To what extent does lack of incentives influence the turnover of teachers?

Hypotheses

1. Teachers do not differ significantly in their mean rating that irregular payment of teachers' salaries influences the turnover of teachers.
2. Teachers do not differ significantly in their mean rating that low wages influence the turnover of teachers.
3. Teachers do not differ significantly in their mean rating that poor society image influences the turnover of teachers.
4. Teachers do not differ significantly in their mean rating that poor work environment influences the turnover of teachers.
5. Teachers do not differ significantly in their mean rating that workload (high student-teacher ratio) influences the turnover of teachers.
6. Teachers do not differ significantly in their mean rating that lack of incentives influences the turnover of teachers.

METHOD

The descriptive survey design was used. The study population consisted of 7,053 public senior secondary school teachers. Using the Fluid Survey Sample Size Calculator, a sample size of 365 teachers was computed and selected with aid of the stratified random sampling technique from 12 schools in the three Senatorial Districts of Rivers State. Four schools were randomly chosen from each of the three senatorial districts and the 365 teachers proportionately selected. A self – designed questionnaire titled "Teachers Turnover Questionnaire (TTQ)" with a reliability coefficient of 0.86 was used to gather data for the study which was analysed using means (with a mean rating of 2.5 and above indicating "High Extent"), standard deviation, and one-way analysis of variance (ANOVA). The TTQ was half-restricted and half-unrestricted. The unstructured part elicited suggestions for the improvement of retention of mathematics and science teachers. Structured interview (based on the items of the TTQ) was also conducted to evoke possible remedies to the problem of mathematics and science teachers' retention.

RESULTS

Table 1: Determinants of mathematics and science teacher turnover

Conditions influencing the turnover of mathematics and science teachers	VHE	HE	LE	VLE	Total
Irregular payments of salaries	201	124	28	12	365
Low wages compared to other professions created by the teacher	213	127	18	7	365
Poor society image	203	115	31	16	365
Poor work environment	195	122	27	21	365
Workload (high student-teacher ratio)	212	105	34	14	365
Poor or lack of incentives	185	152	18	10	365

Note: Very High Extent (VHE); High Extent (HE); Very Low Extent (VLE); Low Extent (LE)

Table 2: Determinants of mathematics and science teacher turnover in Senatorial Districts

Condition	Senatorial District	VHE	HE	LE	VLE	Total
Irregular payment of salaries	Rivers East	74	41	9	6	130
	Rivers West	60	41	10	3	114
	Rivers South-East	67	42	9	3	121
Low wages	Rivers East	74	44	8	4	130
	Rivers West	68	40	4	2	114
	Rivers South-East	71	43	6	1	121
Poor image in society	Rivers East	71	42	13	4	130
	Rivers West	65	35	7	7	114
	Rivers South-East	67	38	11	5	121
Poor work environment	Rivers East	68	47	10	5	130
	Rivers West	62	35	8	9	114
	Rivers South-East	65	40	9	7	121
Workload (Student-Teacher ratio)	Rivers East	74	37	13	6	130
	Rivers West	68	33	9	4	114
	Rivers South-East	70	35	12	4	121
Incentives	Rivers East	65	54	9	4	130
	Rivers West	58	48	5	3	114
	Rivers South-East	62	50	6	3	121

Research Question One: *To what extent does irregular payment of teachers' salaries influence the turnover of teachers?*

Table 3: Mean and Standard Deviation of Teachers' Responses on Irregular Payment of Teachers' Salaries

	N	Mean $(\bar{x})$	Std. Deviation
Rivers East	130	3.4077	.81361
Rivers West	114	3.3860	.75854
Rivers South-East	121	3.4298	.73967
Total	365	3.4082	.77064

High Extent: Mean $(\bar{x}) \geq 2.5$

Table 3 presents N of 130, mean rating of 3.4077, and standard deviation of 0.8136 for Rivers East; N of 114, mean rating of 3.3860, and standard deviation of 0.7585 for Rivers West; and N of 121, mean rating of 3.4298, and standard deviation of 0.7397 for Rivers South-East. The entire State (Rivers East, West, and South-East) has N of 365, mean rating of 3.4082, and standard deviation of 0.7706. The above results indicate a high extent [Mean $(\bar{x}) \geq 2.5$] of influence of irregular payment of salaries on the turnover of teachers. In other words, teachers in Rivers East, Rivers West, and Rivers South-East are in consensus about the extent (high extent) to which irregular payment of salaries influence the turnover of teachers.

Research Question Two: *To what extent do low wages influence the turnover of teachers?*

Table 4: Mean and Standard Deviation of Teachers' Responses on Low Wages

	N	Mean	Std. Deviation
Rivers East	130	3.4318	.77354
Rivers West	114	3.5263	.65460
Rivers South-East	121	3.5339	.59459
Total	365	3.4959	.68188

High Extent: Mean $(\bar{x}) \geq 2.5$

Table 4 presents N of 130, mean rating of 3.4318, and standard deviation of 0.7735 for Rivers East; N of 114, mean rating of 3.5263, and standard deviation of 0.6546 for Rivers West; and N of 121, mean rating of 3.5339, and standard deviation of 0.5946 for Rivers South-East. The entire State (Rivers East, West, and South-East) has N of 365, mean rating of 3.4959, and standard deviation of 0.6819. The above results indicate a high extent [Mean $(\bar{x}) \geq 2.5$] of influence of low wages on the turnover of teachers. In other words, teachers in Rivers East, Rivers West, and Rivers South-East are in agreement on the extent (high extent) to which low wages influence the turnover of teachers.

Research Question Three: *To what extent does poor society image influence the turnover of teachers?*

Table 5: Mean and Standard Deviation of Teachers' Responses on Poor Society Image of Teachers

	N	Mean	Std. Deviation
Rivers East	130	3.5923	.55260
Rivers West	114	3.4912	.66845
Rivers South-East	121	3.3917	.80226
Total	365	3.4851	.69178

High Extent: Mean $(\bar{x}) \geq 2.5$

Table 5 presents N of 130, mean rating of 3.5923, and standard deviation of 0.5526 for Rivers East; N of 114, mean rating of 3.4912, and standard deviation of 0.6685 for Rivers West; and N of 121, mean rating of 3.3917, and standard deviation of 0.8021 for Rivers South-East. The entire State (Rivers East, West, and South-East) has N of 365, mean rating of 3.4851, and standard deviation of 0.6918. The above results indicate a high extent [Mean $(\bar{x}) \geq 2.5$] of influence of poor society image on the turnover of teachers. That is, teachers in Rivers East, Rivers West, and Rivers South-East are in agreement on the extent (high extent) to which poor societal image influence the turnover of teachers.

Research Question Four: *To what extent does poor work environment influence the turnover of teachers?*

Table 6: Mean and Standard Deviation of Teachers' Responses on Poor Work Environment

	N	Mean	Std. Deviation
Rivers East	130	3.6231	.56053
Rivers West	119	3.4874	.63600
Rivers South-East	116	3.3621	.81717
Total	365	3.4792	.69218

High Extent: Mean $(\bar{x}) \geq 2.5$

Table 6 presents N of 130, mean rating of 3.6231, and standard deviation of 0.5605 for Rivers East; N of 114, mean rating of 3.4874, and standard deviation of 0.6360 for Rivers West; and N of 121, mean rating of 3.3621, and standard deviation of 0.8172 for Rivers South-East. The entire State (Rivers East, West, and South-East) has N of 365, mean rating of 3.4792, and standard deviation of 0.6922. The above results indicate a high extent [Mean $(\bar{x}) \geq 2.5$] of influence of poor work environment on the turnover of teachers. That is, teachers in Rivers East, Rivers West, and Rivers South-East are in agreement on the extent (high extent) to which poor work environment influence the turnover of teachers.

Research Question Five: *To what extent does workload (high student-teacher ratio) influence the turnover of teachers?*

Table 7: Mean and Standard Deviation of Teachers' Responses on Workload (High Student-Teacher Ratio)

	N	Mean	Std. Deviation
Rivers East	130	3.5308	.58652
Rivers West	113	3.5310	.65562
Rivers South-East	122	3.4262	.79167
Total	365	3.4659	.69476

High Extent: Mean $(\bar{x}) \geq 2.5$

Table 7 presents N of 130, mean rating of 3.5308, and standard deviation of 0.5865 for Rivers East; N of 114, mean rating of 3.5310, and standard deviation of 0.6556 for Rivers West; and N of 121, mean rating of 3.4262, and standard deviation of 0.7917 for Rivers South-East. The entire State (Rivers East, West, and South-East) has N of 365, mean rating of 3.4659, and standard deviation of 0.6948. The above results indicate a high extent [Mean $(\bar{x}) \geq 2.5$] of influence of high student-teacher ratio on the turnover of teachers. That is, teachers in Rivers East, Rivers West, and Rivers South-East are in agreement on the extent (high extent) to which high student-teacher ratio influence the turnover of teachers.

Research Question Six: *To what extent does poor, or lack of incentives influence the turnover of teachers?*

Table 8: Mean and Standard Deviation of Teachers' Responses on Lack of Incentives for Teachers

	N	Mean	Std. Deviation
Rivers East	130	3.3846	.73013
Rivers West	114	3.4123	.70160
Rivers South-East	121	3.4132	.70320
Total	365	3.4027	.71059

High Extent: Mean $(\bar{x}) \geq 2.5$

Table 8 presents N of 130, mean rating of 3.3846, and standard deviation of 0.7301 for Rivers East; N of 114, mean rating of 3.4123, and standard deviation of 0.7016 for Rivers West; and N of 121, mean rating of 3.4132, and standard deviation of 0.7032 for Rivers South-East. The entire State (Rivers East, West, and South-East) has N of 365, mean rating of 3.4027, and standard deviation of 0.7106. The above results indicate a high extent [Mean $(\bar{x}) \geq 2.5$] of influence of lack of incentives on the turnover of teachers. That is, teachers in Rivers East, Rivers West, and Rivers South-East are in agreement on the extent (high extent) to which lack of incentives influence the turnover of teachers.

Hypothesis One: Teachers do not differ significantly in their mean rating that irregular payment of teachers' salaries influences the turnover of teachers.

Table 9: One-way Analysis of Variance of Mean Rating of Teachers on the Influence of Irregular Payment of Teachers' Salaries on the Turnover of Teachers.

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.113	2	.056	.094	.910
Within Groups	216.063	362	.597		
Total	216.175	364			

Mean difference is not significant at .05: [F(2, 362) = 0.094, p > .05]

Table 9 presents the sum of squares of 0.113, with 2 degrees of freedom, and a mean square of 0.056 for between groups. Within groups has the sum of squares of 216.063, degrees of freedom of 362, and a mean square of 0.597, while the total has 216.175 sum of squares and 364 degrees of freedom. The computed F is 0.094 which is not statistically significant at 0.05. Thus the null hypothesis that "teachers do not differ significantly in their mean rating that irregular payment of teachers' salaries influences the turnover of teachers" is not rejected, F(2, 362) = 0.094, p > .05. In other words, there is no significant difference in the mean rating of teachers of Rivers East, Rivers West, and Rivers South-East that irregular payment of teachers' salaries influences the turnover of teachers. That is, teachers of Rivers East, Rivers West, and Rivers South-East agree that irregular payment of teachers' salaries influences the turnover of teachers.

Hypothesis Two: Teachers do not differ significantly in their mean rating that low wages influence the turnover of teachers.

Table 10: One-way Analysis of Variance of Mean Rating of Teachers on the Influence of Low Wages on the Turnover of Teachers.

ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.072	2	.357	.767	.513
Within Groups	168.172	362	.466		
Total	169.244	364			

Mean difference is not significant at .05: [F(2, 362) = 0.767, p > .05]

Table 10 presents the sum of squares of 1.072, with 2 degrees of freedom, and a mean square of 0.357 for between groups. Within groups has the sum of squares of 168.172, degrees of freedom of 362, and a mean square of 0.466, while the total has 169.244 sum of squares and 364 degrees of freedom. The computed F is 0.767 which is not statistically significant at 0.05. Thus the null hypothesis that "teachers do not differ significantly in their mean rating that low wages influence the turnover of teachers" is not rejected, F(2, 362) = 0.767, p > .05. In other words, there is no significant difference in the mean rating of teachers of Rivers East, Rivers West, and Rivers South-East that low wages influence the turnover of teachers. That is, teachers of Rivers East, Rivers West, and Rivers South-East agree that low wages influence the turnover of teachers.

Hypothesis Three: Teachers do not differ significantly in their mean rating that poor societal image influences the turnover of teachers.

Table 11: One-way Analysis of Variance of Mean Rating of Teachers on the Influence of Poor Societal Image on the Turnover of Teachers.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.769	2	.923	2.001	.113
Within Groups	166.475	362	.461		
Total	169.244	364			

Mean difference is not significant at .05: [F(2, 362) = 2.001, p > .05]

Table 11 presents the sum of squares of 2.769, with 2 degrees of freedom, and a mean square of 0.923 for between groups. Within groups has the sum of squares of 166.475, degrees of freedom of 362, and a mean square of 0.461, while the total has 169.244 sum of squares and 364 degrees of freedom. The computed F is 2.001 which is not statistically significant at 0.05. Thus the null hypothesis that "teachers do not differ significantly in their mean rating that poor society image influences the turnover of teachers" is not rejected, F(2, 362) = 2.001, p > .05. In other words, there is no significant difference in the mean rating of teachers of Rivers East, Rivers West, and Rivers South-East that poor society image influences the turnover of teachers. That is, teachers of Rivers East, Rivers West, and Rivers South-East agree that poor society image influences the turnover of teachers.

Hypothesis Four: Teachers do not differ significantly in their mean rating that poor work environment influences the turnover of teachers.

Table 12: One-way Analysis of Variance of Mean Rating of Teachers on the Influence of Poor Work Environment on the Turnover of Teachers.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.189	2	2.094	4.594	.211
Within Groups	165.055	362	.456		
Total	169.244	364			

Mean difference is not significant at .05: [F(2, 362) = 0.937, p > .05]

Table 12 presents the sum of squares of 4.189, with 2 degrees of freedom, and a mean square of 2.094 for between groups. Within groups has the sum of squares of 165.055, degrees of freedom of 362, and a mean square of 0.456, while the total has 169.244 sum of squares and 364 degrees of freedom. The computed F is 2.001 which is not statistically significant at 0.05. Thus the null hypothesis that "teachers do not differ significantly in their mean rating that poor work environment influences the turnover of teachers" is not rejected, F(2, 362) = 4.594, p > .05. In other words, there is no significant difference in the mean rating of teachers of Rivers East, Rivers West, and Rivers South-East that poor work environment influences the turnover of teachers. That is, teachers of Rivers East, Rivers West, and Rivers South-East agree that poor work environment influences the turnover of teachers.

Hypothesis Five: Teachers do not differ significantly in their mean rating that workload (high student-teacher ratio) influences the turnover of teachers.

Table 13: One-way Analysis of Variance of Mean Rating of Teachers on the Influence of Workload on the Turnover of Teachers.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.889	2	.445	.956	.385
Within Groups	168.355	362	.465		
Total	169.244	364			

Mean difference is not significant at .05: [F(2, 362) = 0.956, p > .05]

Table 13 presents the sum of squares of 0.889, with 2 degrees of freedom, and a mean square of 0.445 for between groups. Within groups has the sum of squares of 168.355, degrees of freedom of 362, and a mean square of 0.465, while the total has 169.244 sum of squares and 364 degrees of freedom. The computed F is 0.956 which is not statistically significant at 0.05. Thus the null hypothesis that "teachers do not differ significantly in their mean rating that workload influences the turnover of teachers" is not rejected, F(2, 362) = 0.956, p > .05. In other words, there is no significant difference in the mean rating of teachers of Rivers East, Rivers West, and Rivers South-East that workload influences the supply and turnover of teachers. That is, teachers of Rivers East, Rivers West, and Rivers South-East agree that workload influences the turnover of teachers.

Hypothesis Six: Teachers do not differ significantly in their mean rating that poor or lack of incentives influences the turnover of teachers.

Table 14: One-way Analysis of Variance of Mean Rating of Teachers on the Influence of Poor Incentives on the Turnover of Teachers.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.066	2	.033	.065	.937
Within Groups	183.731	362	.508		
Total	183.797	364			

Mean difference is not significant at .05: [F(2, 362) = 0.937, p > .05]

Table 14 presents the sum of squares of 0.066, with 2 degrees of freedom, and a mean square of 0.033 for between groups. Within groups has the sum of squares of 183.731, degrees of freedom of 362, and a mean square of 0.508, while the total has 183.797 sum of squares and 364 degrees of freedom. The computed F is 0.065 which is not statistically significant at 0.05. Thus the null hypothesis that "teachers do not differ significantly in their mean rating that poor incentives influence the turnover of teachers" is not rejected, F(2, 362) = 0.937, p > .05. In other words, there is no significant difference in the mean rating of teachers of Rivers East, Rivers West, and Rivers South-East that poor incentives influence the turnover of teachers. That is, teachers of Rivers East, Rivers West, and Rivers South-East agree that poor incentives influence the turnover of teachers.

Table 15: Ranking of suggested remedies to the problem of turnover mathematics and science teachers

Factors influencing the turnover of math and science teachers	**Ways to reduce turnover of math and science teachers (Remedies)**	**Rank**	**MI**	**I**	**LI**	**NI**	**Total**
Irregular payments of salaries	Regular salary payment	1st	243	110	10	2	365
Low wages compared to other professions created by the teacher	Higher wages compared to other professions created by the teacher	2nd	213	106	30	16	365
Poor society image	Enhanced status in the society	6th	68	97	104	96	365
Poor work environment	Beautiful work environment	4th	194	112	44	15	365
Workload (high student-teacher ratio)	Reduced workload (low student-teacher ratio)	5th	84	87	102	92	365
Poor or lack of incentives	Great incentives	3rd	210	152	18	10	365

Note: Most important (MI); Important (I); Least important (LI); Not important (NI)

Table 16: Interview responses to the remedies to the problem of mathematics and science teacher turnover

S/No.	Conditions	Responses
1	Irregular payments of salaries	This is a very serious source of the problem of mathematics and science teachers' supply and turnover. In fact this problem affects all teachers and cannot be toyed with. If teachers' salaries are paid regularly, people would look at the teaching profession the same way as other professions. This will attract more students into mathematics and science (increase in supply) and when they become teachers, they will not be in a hurry to leave to other professions (reduced turnover). *Information in brackets is mine*
2	Low wages compared to other professions created by the teacher	This is the main source of the problem of supply and turnover of mathematics and science teachers. A good wage will attract more people to and keep more people in teaching. As a matter of fact, teachers are supposed to earn higher than all others. Without the teacher, those others will not exist. Remember those days when we were little children, teachers were the cynosure of all eyes. They were admired and respected. They were the ones bestowed with the discipline of stubborn and wayward children. Teaching was where to be. But today what do we have: teachers are relegated to the background and school dropouts are the policy makers and executioners. Result is continuous decline in the standard of education. If teachers' wages are good, issues of status in the society, incentives, workload, opportunities for growth and many more will not be there. Teachers will be respected and honoured like in the days of old.
3	Poor society image	If wages are good and salaries are paid when due, poor society image will not exist. Good image and reduced turnover.
4	Poor work environment	Teachers' work environment is a big challenge. Look at the staff rooms and see how congested and uncomfortable they are. Some teachers share the same tables and chairs. This is not only demoralising but also impedes academic work (preparation for teaching, scoring of assignments and tests, and research work). It further creates health challenges and eventual death. The teachers (the *geese* that lay the golden eggs) should work in beautiful environments that will not only make them proud but will also promote their academic work and enhance their quality of life. This will obviously attract more students into mathematics and science (increase in supply) and when they become teachers, they will not be in a hurry to leave to other professions (reduced turnover).
5	Workload (high teacher-pupil ratio)	While it is true that teachers' workload is a problem, you will agree that if wages are high, salaries are paid regularly, and work environment is good, many teachers will ignore the high workload. In other words, with good things of life provided for the teacher, high workload will not be a serious challenge.
6	Lack of incentives	Car and housing loans (with good wages and prompt salary payments), what could cause a teacher to leave the teaching profession. This is not impossible, but its occurrence shall be significantly very low.

DISCUSSION OF FINDINGS

This study found that irregular payment of teachers' salaries is a main source of mathematics and science teachers' turnover. If teachers' salaries are paid regularly, people would look at the teaching profession the same way as other professions which will attract more students into mathematics and science (increase in supply) and when they become teachers, they will not leave in a hurry to other professions (reduced turnover). Ayeni (2005) found that school principals lamented that teachers are not willing to work and many are leaving because of irregularity and delays in payment of their salaries

Teachers' wages are low compared to other professions created by the teacher. This was found to be another determinant of mathematics and teacher turnover. A good wage will attract more people into, and keep them in teaching. Agreeing with this finding, Keesler and Schneider (2010) found that mathematics and science teachers are more likely to leave to other jobs at higher rates because they have more alternative career options in the business and technological sectors, often with higher salaries, than teachers in other fields. As a matter of fact, the teaching profession is supposed to earn higher than all others professions for without the teacher, they cannot exist.

Congested and uncomfortable staffrooms where some teachers do not have tables and chairs, dilapidated and congested classrooms, and sometimes teaching under the trees are dehumanising conditions that have been found to encourage the turnover of mathematics and science teachers. The teachers' work environment in Nigeria has been described by Adelabu (2003) as the most impoverished of all sectors of the labour force with the facilities in most schools dilapidated and inadequate. The teachers (the *geese* that lay the golden eggs) should work in beautiful environments that will not only make them proud but will also promote their academic work and enhance their quality of life. This will obviously attract more students into mathematics and science (increase in supply) and when they become teachers, they will not be in a hurry to leave to other professions (reduced turnover).

It was found that turnover of mathematics and science teachers is enhanced in situations where the teacher-pupil ratios of Creche (1:10); Nursery (1:25); Primary (1:35); Junior Secondary School (1:35); Senior Secondary School (1:40); and Technical Colleges (1:20) stipulated by the FRN (2013) are not enforced and teachers work themselves to death like the Boxer of George O' Well's *Animal Farm*. This finding is in consonance with that of Moja (2000) who found that most classrooms in Nigeria are overcrowded and in some instances schools have operated with teacher-pupil ratio of 1:76.

Lack of car and housing loans to teachers (which the contemporaries of the teachers outside the teaching profession are given without *much ado*) was found to be a determinant of mathematics and science teacher turnover. In consonance with this finding, Kamoh, Ughili, and Abada (2013) found that although teachers are civil servants, they are not treated as one, and that poor incentives to teachers are associated with teacher turnover. This suggests that if teachers are treated right, they will remain in the teaching profession.

Teachers' poor image in society was found to be a major determinant of mathematics and science teacher turnover. This position is supported by Baike (2002) who found that the social status of teachers has been identified as an important factor impacting teacher's morale and motivation, and consequently, the turnover of teachers. This study further found that if teachers' wages are good and paid regularly, good incentives provided, workload optimum, work environment attractive and comfortable, then poor teachers' image in the society shall be non-existent, leading to reduced turnover.

CONCLUSION AND RECOMMENDATIONS

Some turnover of mathematics and science teachers is, of course, normal, inevitable, and beneficial. For individuals, departures leading to better jobs, either in teaching or not, can be a source of upward mobility. For schools, departures of low-performing employees can enhance organizational outcomes, while departures of high-performing teachers can be great source of staffing challenge. However, from an organizational viewpoint, none of these departures are cost free: whether to other schools, or to other education jobs, or to jobs outside education. All have the same effect: they typically result in a decrease in classroom mathematics and science teachers which constitute serious staffing problems to students, teachers, education administrators, and policy makers in education.

This study found that major determinants of turnover of mathematics and science teachers are irregular salary payment, low wages compared to other professions, poor society image, poor work environment, high teacher-pupil ratio, and lack of incentives. Based on the findings and to curb the turnover of mathematics and science teachers, the study recommends as follows:

1. Teachers' wages should be higher than the wages of all other professions (the teacher created them). This way the teachers will not have any better place to go to. This will also attract the best brains to the teaching profession. The result will be enhanced students' academic performance and higher standard of education.
2. Salaries of teachers should be paid regularly and promptly irrespective of the odds at play. This will enable better teachers' commitment and loyalty, and ensure uninterrupted school calendar leading to good planning and proper execution of education policies and management.
3. Teachers' work environment should be better than or at worst equivalent to that of Shell or bank workers. It is said that "the hatred for a nursing mother affects her child". When teachers work in horrible environments, their commitment and attention to their students are impaired. Teachers should be provided with good work environment to prepare their lessons, score scripts for prompt feedback to students, and for their health (health is wealth).
4. Teacher-pupil ratio, as stipulated in the National Policy on Education, should be enforced so that teachers would work like humans not robots. A situation where a teacher has up to 200 or more students in his class is an aberration which hinders pupils' proper development and ruins teachers' practice of excellence.
5. Car and housing loans should be extended to teachers. This will enable them own cars and houses when their ranks so allow, rather than live like peasants when their contemporaries are comfortable (some were their pupils and students who belong to other professions).
6. It must be realised that poor society image of teachers is a function of low wages, irregular payment of salaries, enormous workload, poor work environment, and lack of incentives to teachers. When teachers' wages are the highest, salaries are paid regularly, work environment is state of the art, workload is optimum, and incentives are juicy, the poor society image of teachers will be non-existent.

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