

**TEACHERS' FACTORS AS PREDOMINANT TO STUDENTS' ACADEMIC
PERFORMANCE IN MATHEMATICS IN OGUN STATE, NIGERIA.**

Abiodun T.O

Department of Mathematics

Tai Solarin University of Education,

Ijagun, Ijebu Ode, Ogun State.

Lawani A.O

Department of Mathematics

Tai Solarin University of Education,

Ijagun, Ijebu Ode, Ogun State.

Fatade O.A

Department of Mathematics

Tai Solarin University of Education,

Ijagun, Ijebu Ode, Ogun State.

Asanre A.A.

Department of Mathematics

Tai Solarin University of Education,

Ijagun, Ijebu Ode, Ogun State.

Abstract

The important role of the teachers in the learning process is unquestionable. Teachers have a lot of influence on their classroom practices. This study examined teachers' factors as predominant to students' academic performance in Mathematics, in Ogun State, Nigeria. The study adopted descriptive research design of survey type. The sample for this study was made up of 320 respondents consisting of 200 teachers and 120 students randomly selected from forty secondary schools (public and private) in Ijebu- Ode, Odogbolu and Ikenne Local Government area of Ogun State respectively, using simple random sampling technique five Mathematics teachers and three Mathematics students were selected from each school. Three research questions guided the study. Data collected were analyzed using Pearson Product Moment Correlation and Multiple Regression Analysis at $p < 0.05$. The results revealed that Teachers' qualification, Teachers' methodology, Teachers' attitude and teachers' Sex jointly significantly predicted students' achievement in Mathematics. The study recommended that Would-be Mathematics teachers are trained to develop skills, through appropriate methodology course in teacher education programme that lay more emphases on teachers' personality variable including the three predictor variables in this study.

Keywords: Teachers' qualification, Teachers' methodology, Teachers' attitude and teachers' sex, performance & Mathematics.

Introduction

Mathematics is one of the important subjects taught in all schools throughout the world due to its relevance to other subject most especially in the development of science and technology. The term "teacher characteristics" can be referred to as qualities that can be measured with tests or derived from their academic or professional records. They indicate that teacher characteristics does not generally refer to the direct observation of their influence on students' learning in terms of either students' test performance or teaching behaviors. Rather, the approaches dealt within the scope of this research are those that fall traditionally into the province of personnel psychology or personnel selection. This review deals with those characteristics of teachers that might be identified and used in the initial hiring of teachers to increase their students' achievement. Ashton (1996), indicates that these characteristics could include qualities of teachers that are viewed as personal – such as mental ability, age, and gender – or as "experiential" – such as certification status, educational background, previous teaching experience and the like. Some characteristics are

combinations – in unknown amounts – of personal and experiential qualities, for example; candidates' performance on teacher certification tests such as the national teacher examinations and state-mandated tests.

Ali (2009) observes that there was statistically significant relationship between teacher characteristics and student academic achievement. Adeyemo (2005), notes teacher characteristics influenced teaching and learning in classrooms. Olaleye (2011), establishes that there was relationship between teachers characteristics and pupils performance. Goldhaber (2000), states that the explanations for good or poor student's academic performance have been quite exhaustive yet controversy still exists among scholars as to what contribute singly or jointly to students' poor performance. The teacher characteristics found to be dominant in across-country studies are related to; qualification, gender (SEX), attitude and methodology e.t.c.

Akinsolu (2010), asserts that availability of qualified teachers determined the performance of students in schools. Coonen (1987), emphasizes that teachers involved in in-service training were more effective in classrooms as compared to teachers who had not undergone training. Wilson (2011), indicate that teacher's attitude contributed significantly to student attention in classrooms whereas Adesoji & Olatunbosun (2008) illustrates that student attitude was related to teacher characteristics. This therefore meant that teacher's attitude directly affected students' attitude. On teacher personality, Adu & Olatundun (2007) contend that teachers' characteristics are strong determinants of students' performance in secondary schools. Scholars and researchers generally are in agreement that the school variables, which include teacher administration, perform a critical role in educational achievement than other variables (Patrick, 2005). The important role of the teachers in the learning is unquestionable. Teachers have a lot of influence on their classroom practices. Teachers should have and apply specific abilities without which their influence may not be reflected in their students' performance in the subject. For students to be able to make connection between what is taught in school and its application in problem solving in real life, the teacher has to be effective in their teaching.

More so, the importance of teachers' factors in realizing educational goals and objectives in any educational system cannot be over emphasized. Teacher factors or characteristics are the instructional behaviours exhibited by the teacher towards goal attainment. These characteristics are the combination of peculiar qualities, traits, mental or moral nature/strength and status that make one person or group different from another.

Successful teachers' characteristics are those that have been found by empirical researches to be related to improved achievement by students in the cognitive, affective or psychomotor outcomes of education (Owoeye & yara, 2011). The bedrock of educational system lies on a core of devoted, knowledgeable, competent and well-trained teachers. Greitzer (2012), rightly pointed out that if a person is to be successful in his chosen career, that individual also needs a set of ethical beliefs or standards for guidance or direction in the appropriate use of competences. A competent teacher seeks to know his learners' behaviour in teaching, must perceive the individual learner as a whole since he has affective, cognitive and psychomotor talents. Also, students' participation in the instructional process is critical and their perception presents methodological challenges. The knowledge of the way the students think and perceive can aid the teacher to reflect upon and adjust his teaching strategies to enhance students' understanding and achievement. Ahiauzu (2011), described perception as the way people judge others with who they are in contact. A persons' attitude to an idea or object determines what the person thinks, feels and how the person would like to behave towards that idea or objects.

Research Question

- (1) What are the relationships among the teachers' factors on students' performance in Mathematics?
- (2) What is the relative contribution of teachers' factors to students' performance in Mathematics?
- (3) To what extent will teachers' factors predict students' performance in Mathematics?

Methodology

The population comprised of all the students and teachers of Mathematics in Ogun-State, Nigeria. The study adopted descriptive research design of survey type. The sample for this study was made up of 320 respondents consisting of 200 teachers and 120 students randomly selected from forty secondary schools (public and private) in Ijebu- Ode, Odogbolu and Ikenne Local Government area of Ogun State respectively, using simple random sampling technique five Mathematics teachers and three Mathematics students were selected from each school. The instrument for data collection was a five- point structured questionnaire titled "Teachers' Factors on Students' Performance in Mathematics Questionnaire (TFSPQ)". The reliability of the instrument was determined using Cronbach alpha reliability with coefficient

0.792. The data were analyzed using Pearson Product Moment Correlation and Multiple Regression Analysis.

Results

Research question one:

What are the relationships among the teachers' factors on students' performance in Mathematics?

Table 1: Correlation Matrix of the Independent Variables and Dependent Variable

Variables	Qualification	Attitude	Methodology	Sex	Performance
Qualification	1				
Attitude	0.660	1			
Methodology	0.857	0.789	1		
Sex	-0.014	-0.041	0.10	1	
Performance	0.866*	0.738*	0.819*	-0.004	1

*Correlation significant at 0.05 levels.

Table 1 reveals that there is positive significant relationship between teachers' qualification and student' performance in Mathematics ($r = 0.866, p < .05$) this implies that the performance of Students performance in Mathematics depends on the teachers' teachers qualification. That is the higher the teachers qualification the better the students' performance in Mathematics and vice versa. Likewise, there is positive significant relationship between teachers attitudes and student academic performance ($r = 0.738, p = 0.05$). this means that the performance of students in Mathematics is affected by the teachers attitude. Therefore, the better the teachers attitudes to the students the better the interaction among the teachers and the students. Hence, the better the performance of the students. Also there is a positive significant relationship between the Teachers' methodology and students' performance in Mathematics which implies that the method is used by the teachers in dissemination of knowledge which affect the output of the students. There is a negative relationship between the teachers' sex and students' performance in mathematics ($r = -0.004$) this implies that the sex of the teachers do not affect the performance of students in Mathematics.

Research Question two: What is the relative contribution of teachers’ factors to students’ performance in Mathematics?

Variables	R	R-Square	Adjusted R-Square	Standard Error of estimate	F	Significant	Remark
Attitude	0.495	0.245	0.244	0.778	381.17	0.00	*
Methodology	0.565	0.319	0.369	0.662	646.32	0.00	*
Qualification	0.729	0.351	0.450	0.576	957.90	0.00	*
Sex	0.004	0.002	-0.033	1.153	0.006	0.940	*

*Correlation significant at 0.05 levels.

Each of the teachers’ factors significantly contributes to the performance of students in mathematics. Based on the R-square values, the prediction in descending order of magnitude as follows: Teachers’ qualification (35.1%), Teachers methodology (31.9%), Teachers’ attitude (24.5%) and teachers’ Sex (0.2%). This percentage indicates the contribution of each of the teachers’ factors to their performance in Mathematics.

Research Question Three:

To what extent will teachers’ factors predict students’ performance in Mathematics?

Table 1: Combined influence of teachers’ factors on Students’ academic performance in Mathematics.

$R = 0.895$

$R \text{ Square} = 0.501$

$Adjusted R \text{ Square} = 0.798$ $Standard \text{ Error of Estimate} = 0.517$

Model	Sum of Square	Df	Mean Square	F	Significant	Remark
Regression	338.536	4	84.634	316.57	0.00	
Residual	84.214	315	0.267			
Total	422.750	319				

*Correlation significant at 0.05 levels.

In table 1 above, the independent teachers' Variables (Qualification, Methodology, Attitude and sex) contributed 50.0% of the total variance in students Mathematics performance (R-Square= 0.501, $p= 0.05$). This percentage is significant. Therefore the independent variables listed above are important factors to predict or determine the performance of students in Mathematics.

Discussion:

The finding shows that the four predictor variables (Teachers' qualification , Teachers methodology, Teachers' attitude and teachers' Sex jointly significantly predicted students' achievement in Mathematics gave credence and empirical support that Teachers' qualification , Teachers methodology, Teachers' attitude and teachers' Sex are important factors when explaining achievement of secondary school Mathematics (Adeniji, 1999; Osokoya ,2012; Oladele,2011; Winters, 2013). This shows that these factors play significant roles in explaining achievement in mathematics.

Also findings show that each of the teachers' factors significantly contributes to the performance of students in mathematics. Based on the R-square values, the prediction in descending order of magnitude as follows: Teachers' qualification (35.1%), Teachers' methodology (31.9%), Teachers' attitude (24.5%) and teachers' Sex (0.2%). This percentage indicates the contribution of each of the teachers factors to their performance in Mathematics. Teachers' qualification significantly predicted students' achievement in Mathematics further gives empirical support to the existing findings on Teachers' qualification as a significant in students' achievement in School Mathematics performance .The most important factor in improving students' achievement in mathematics is by employing seasoned qualified teachers in all schools. Abe and Adu, 2013, found that, policy investment on quality of teachers is related to improvement in students' performance in mathematics. In addition, the finding shows that Teachers' methodology predicted students' achievement in Mathematics which is in consonant with the findings by Teo & Wong (2000) of opinion that to facilitate the process of knowledge transmission, teachers should apply appropriate teaching methods that best suit specific objectives and level to exhibit favourable outcomes. Also, findings shows that Teachers' attitude significantly predict students' achievement in Mathematic which supported the earlier findings of Steele & Jenifer (2003), that positive teacher attitude towards Mathematics was significantly related to high achievement in pupils. Bridget, Vinson & Beth (2011), studied how the teachers' attitude contributed to students' academic

performance and behaviour. However, the finding shows that the teachers' sex does not significantly predict students' achievement in Mathematic is not surprising and is at the variance with a recent study in the economics literature finds no evidence of a relationship between teacher gender and test score outcomes (math and reading) of students irrespective of gender, in school (Winters, 2013).

Conclusion

This study investigated the predictive effects of some teachers' factors on students' achievement in Mathematics. The study is in addition to the frontiers of knowledge o teachers' factors as determinants of students' academic achievement in different school subjects, especially secondary school Mathematics. The results of this study revealed that Teachers' qualification , Teachers methodology, Teachers' attitude and teachers' Sex jointly significantly predicted students' achievement in Mathematics. The results shows that Teachers' qualification has the highest contribution; follows by Teachers methodology then by Teachers' attitude while teachers' Sex recorded negative and insignificant contribution.

Recommendations

In line with the findings of this study, it is hereby recommended that:

- (1) Would-be Mathematics teachers are trained to develop skills, through appropriate methodology course in teacher education programme that lay more emphases on teachers' personality variable including the three predictor variables in this study.
- (2) It is also imperative that necessary measures be put in place in our educational system in Nigeria to enhance the positive self-concept of learners through the use of varieties of teaching strategies that are capable of making the teaching and learning of Mathematics more practical and relevant to everyday needs of the learners.
- (3) Teachers' attitudes and characters to students should be positive. Also, teachers should exhibit interest in the subject if he/she is to sufficiently motivate his students to learning.
- (4) It is expected that the government should also see the need to engage the in-service teachers in training and retraining.
- (5) The government should ensure that the round pegs are not put into a square hole and ensure that only teachers with pedagogical background are allowed to teach in the classroom.

References

- Abe T. O. & Adu E. I. (2013). Influence of Qualification on Development and Assessment of Computer Programmed Instructional Package on Energy Concept in Upper Basic Technology in Ekiti State. *Journal of Science Technology* 3 (6): 611-618.
- Adeniji, I. A. (2003). Towards Effective Implementation of Universal Basic Education (UBE) in Nigeria. *Contemporary Issues in Educational Management, A book of honour*. The Department of Educational Management, University of Ibadan, Ibadan, pp.: 67- 80.
- Adesoji, F. A. & Olatunbosun, S. M. (2008). Student, Teacher and School Environment Factors as Determinants of Achievement in Senior Secondary School Chemistry in Oyo State, Nigeria. *The Journal Of International Social Research Volume 2 pp. 13-34*.
- Adeyemo, D. A. (2005). “ Parental Involvement Interest in Schooling and School Environment as predictors of Academic Self-efficacy among Fresh Secondary School Student in Oyo State, Nigeria ”. *Electronic Journal of Research in Educational Psychology*, 5 - 3:163 180.
- Ahiauazu, L. U. (2011). *Standardizing the motivational Competence of academically qualified teachers and professional Teachers in Nigeria secondary schools proceedings of 2011 internal conference on Teaching, Learning change: Int. Association for Teaching and Learning (IATEL)*.
- Akinsolu, A.O. (2010). Teachers and Students’ Academic Performance in Nigerian Secondary Schools: Implications for Planning. *Florida Journal of Educational Administration & Policy Volume 3, Issue 2 pp 86-103*.
- Ali , A. A. (2009). *The impact of teacher wages on the performance of students: evidence from PISA* pra.ub.unimuenchen.de
- Goldhaber, D. D., & Brewer, D. J. (2000). “Does Teacher Certification Matter? High school Teacher Certification Status and Student Achievement” *Educational Evaluation and Policy Analysis*, 22 (2):129-145.
- Greitzer, F. A. (2012). “*Cognitive Approach to Student-Centered E-Learning, Human Factors and Society*,” 46th Annual Meeting, Sept 30 – Oct 4.
- Oladele, J. O. (2011). *The effect of early qualification on the achievement of Pre-ND students in Kaduna Polytechnics* (Unpublished Post Graduate Diploma Dissertation), University of Ibadan, Ibadan.
- Olaleye, F.O. (2011). Teachers Characteristics As Predictor Of Academic Performance of Students In Secondary Schools In Osun State –Nigeria *European Journal of Educational Studies* 3(3),pp 505-511.
- Osokoya, M. M. (2012). *Some determinants of secondary school students’ academic achievement in Chemistry in Oyo State* (Unpublished Ph.D. Thesis) University of Ibadan, Ibadan.

Owoeye, J. S. & Yara, P. O. (2011). School Location and Academic Achievement of Secondary School in Ekiti State, Nigeria. *Asian Social Science* Vol. 7, No. 5; pp 170-175.

Patrick, B. (2005). Why children must not be Compared in *Education Sight for Quality Information Magazine*, Kenya

Steele & Jennifer. (2003). Children's gender stereotypes about math: The role of stereotype stratification. *Journal of Applied Social Psychology* 33, no. 12:2587–2606.

Teo, R. & Wong, A. (2000). "Does Problem Based Learning Create A Better Student: A Reflection?," Paper presented at the 2nd Asia Pacific Conference on Problem Based Learning: Education Across Disciplines, December 4-7, Singapore.

Vinson & Beth. (2001). A comparison of pre-service teachers mathematics anxiety before and after a methods course emphasizing manipulates. *Early Childhood Education Journal* 29, no. 2:89-94.

Wilson, S. M. (2011). Teacher Preparation Research: Current Knowledge, Gaps, and Recommendations: *A Research Report prepared for the U.S. Department of Education and the Office for Educational Research and Improvement by the Center for the Study of Teaching and Policy in collaboration with Michigan State University.*

Winters, A. (2013). The effect of same-gender teacher assignment on student achievement in the elementary and secondary grades: Evidence from panel data. *Economics of Education Review* 34: 69-75.