Global Forum for African Studies (GLOFASE)
2022 Vol 5. No. 2 IP INDEXING ISSN: 2284-1156

THE EFFECT OF TEACHER COMPETENCE ON SS II STUDENT ACHIEVEMENT IN MATHEMATICS IN KANKE LOCAL GOVERNMENT AREA OF PLATEAU STATE

Gakbish, J.G., Mwagidtang, A.Y., Toma, I.A., & Golji, G.G.

Mathematics Department, Federal College of Education (FCE), Pankshin
Plateau State, Nigeria
jgakbish@yahoo.com
08062992269

Abstract

This study investigated the effect of teacher's competence on SS2 student's achievement mathematics in Kanke local Government Area of Plateau State. In carrying out the investigation, the descriptive survey research design was used. six schools were randomly selected from all the schools in Kanke metropolis. The sample for the study which was randomly selected comprises of 180 Senior Secondary 2 students. Three research questions and hypotheses were raised. Questionnaires were raised and given to both teachers and students to answer. Mean and standard deviation were used to answer the research questions while research hypotheses were tested using t-test for independent sample at 0.05 level of significant. The result showed that there is a significant relationship between teachers' qualification, competency, knowledge, on students' achievement in Mathematics. It was recommended that more training should be given to the mathematics teacher to keep him up to date. Qualified teachers should be recruited in the teaching profession most especially in mathematics.

Keywords: Mathematics, Competency, and Achievement.

Introduction

Education and its benefits can never be over emphasized as the root of economic, industrial, political, scientific, and technological, and even religious development. All aspects of development are centered on education. Education is one of the vital instruments for development in any nation. Every educational system at every level depends heavily on teachers for the execution of its programmes. Teachers are highly essential for successful operation of the educational system and important tools for the educational development. Teachers at all levels of education play a decisive role in pivoting the growth and direction for education. It is an acceptable fact that the teacher is the most important cog in the educational machine and that teachers are highly instrumental to the success of any educational programme embarked upon by any government Parks (2012). This is because apart from being at the implementation level

of any educational policy, the realization of these programmes also depends greatly on teachers' dedication and commitment to their work.

Many factors contribute to student's academic achievement, including individual characteristics, family and neighborhood experiences. However, researchers such as Jordan, Mendro and Weersinge (2017), suggest that among school related factors, teachers matter most. When it comes to students' performance, a teacher is estimated to have two or three times the impact than any other school factor, including services, facilities and even leadership (Mohammed & Yusuf, 2015). Effective teachers are best identified by their performance not by their background or experiences. Despite common perceptions, effective teachers cannot reliably be identified based on which school they went to school, whether they are registered or how long they have taught. The best way to assess teachers' effectiveness is to look at their job performance including what they do in the classroom and how much progress their students make on achievement tests. Quality teachers are considered to be those who bring about high students' performance in learning (Harris & Sass, 2016). Non-school factors do influence students' achievement, but effective teaching has the potential to help level the playing of such factors.

The importance of quality teaching is no secret and cannot be overemphasized. School administrators have always sought out the best teachers they could get in the belief that their students' success depends on it. If teachers are so important to student's learning, then schools should make sure all students receive the benefits of quality teaching. More than two decades of research findings are unequivocal about the connection between teacher quality and student learning. The report of the National Commission on teaching and America's future (2017), made teaching the core of its three simple promises in its blueprint for reforming the nation's schools. They are what teachers know and can do as the most important influence on what students learn. Recruiting, preparing, and retaining good teachers is the central strategy for improving schools. School reform cannot succeed unless it focuses on creating the conditions under which teachers can operate and teach well. A highly effective teacher, therefore, is one whose students show the most gains from one year to the next. By using this approach, researchers can isolate the effect of the teacher from other factors related to students' achievement such as students' prior academic records or schools they attended. "The effect of teaching on students learning is greater than student ethnicity or family income, school attended by students or class size. The effect is

stronger for poor and or minority students than for their more affluent peers, although all groups benefit from effective teaching.

The impact of teachers in the performance of students' is relevant. The teachers are the facilitators who are to impact into the students the concepts expected to be learnt. However, Olarewaju (2016) and Nwagbo (2015) believed ignorant of the teachers or neglect of activity-oriented methods by the teachers grossly contribute to students' low achievement. When considering growth in technology, the development of human capital is paramount (Fajonyomi, 2017). This was in line with the view of Ogbazi (2017) who noted that problem of industrial development in Nigeria is that of inadequacy of sufficiently trained human resources and this has been a major constraint on the rate of technological and economic development of the country. 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 Adeniyi (2013) noted that a country's manpower development depends on the quantity of her well-qualified teachers. As stipulated in the Nigeria National Policy on Education (2014), teaching at the secondary school is meant to develop essential scientific skills in the learners to prepare them for application in order to stimulate and enhance creativity in them.

The availability of professional teachers in our schools is low (Ngada, 2018). 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 abled bodied young men and women thus handle the job as a bye-pass venture to their desired ends. Consequently, their input on the job would be very low since it lacks the 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 resultant effect on the students' performance is catastrophic. The major evil done by this is half-backed and shallow-knowledge students who often perform poorly in their examinations.

A qualified mathematics teacher can easily use different approaches/ methods, styles, illustrations, examples, and improvise materials in teaching students' mathematics concepts, principles or ideas which his counterpart (unqualified mathematics teacher) cannot do. This

suggests that student mathematics interest is dependent on qualification of the mathematics teacher. A qualified mathematics teacher can arouse students' interest in mathematics learning and ensure success in the learning of the subject using appropriate instructional strategies in teaching the student. Teachers' effectiveness in any subject is an important determinant in that subject (Akinoso, 2011). Therefore, engaging qualified mathematics teachers who is equipped with various instructional strategies in teaching mathematics enhances students' interest to learn mathematics. This can be done through the teacher's application of his teaching styles, good, trained mind and competencies which invariably eliminates anxiety in the students' learning of the subject. And qualified mathematics teacher uses varieties of mathematics games and improvise teaching materials to drive home mathematics concepts, ideas and principles competently.

Over the years, students' achievement has prompted educational researchers to continuously make relentless efforts at identifying mitigating factors that might account for the observed poor achieving. Some research studies suggest that factors inside and outside the classroom affect students' achievement. Among other variables identified are Students' poor study habit, low self-esteem, teacher factors (teacher quality), shortage of qualified teachers, inadequate teaching facilities in Schools, home factor, school environmental factors and many others. Despite their efforts, students continue to exhibit poor achievement. In this vein, teacher factor has been linked to be one of the causes of students' low achievement, in this sense there is need to look into the quality of teachers in our secondary schools because effective teaching elicits effective learning. Teacher is the principal initiator of learning. The poor achievement in Mathematics as indicated by various empirical studies (Ferdinand, 2017; Betiku, 2011; Omole, 2013; Adeniji, 1998; NECO and WAEC Chief Examiner's reports, (2115,2014) respectively) have attracted the concern of all stakeholders including the researchers. Subsequently many factors have been identified and regarded as being responsible for the dwindling trend in the achievement of students. These factors include school- teacher related characteristics, teaching methods social incentives, and a host of others (Olatoye, 2013; Ogunkola, 2018). This suggests that if the afore listed factors and others can be taken into consideration, students will excel more in Mathematics generally and in basic science. However, the poor achievement in Mathematics according to (Omole, 2013) is due to teacher's use of ineffective methods and strategies in mathematics

teaching which among other factors have contributed to the student's poor achievement and interest in mathematics at the junior and senior secondary school Achievement according to Adeyemi (2018) is the scholastic standing of a student at a given moment. It has to do with the successful accomplishment of goal(s). The purpose of testing an achievement is to help the teacher and the students evaluate and estimate the degree of success attained in learning given concept. It is also useful in testing the interest and achievement of information and skill in matrix. It is equally appropriate in determining the mean interest rating of students taught matrix using guided discovery strategy. One of the issues at stake in education today is students' achievement measure in relation to teaching and the overall success of learning outcome, use of guided discovery teaching strategy in teaching simple machine by basic science teachers may make Mathematics lesson objective stimulating and interesting to the students.

It is against this background that the researchers seek to examine the effect of teacher competence on students' achievement in number line in Kanke Local Government Area of Plateau State.

Statement of the Problem

The teacher's primary role of transmission of knowledge and skills is never in dispute. Therefore, a teacher would need to demonstrate efficiency in this primary role. Indeed, teachers' academic background, training and professional competence is at stake here. There is deficiency and poor academic achievement of students', and this could be traced to lack of teachers' competence and learning resources in our classrooms. This might be one of the reasons for the poor performance of students in the subject. Over the years, students' achievement in mathematics has prompted educational researchers to continuously make relentless efforts at identifying mitigating factors that might account for the observed poor achievement. Some research studies suggest that factors inside and outside the classroom affect students' achievement and interest. Among other variables identified are: Students' poor study habit, low self-esteem, teacher factors (teacher quality), shortage of qualified teachers, inadequate teaching facilities in Schools, home factor, school environmental factors and many others. Despite their efforts, students continue to exhibit poor performance. In this vein, teacher factor has been linked to be one of the causes of students' poor achievement, in this sense there is need to look into the competence of teachers in our

secondary schools because effective teaching elicit effective learning. Teacher is the principal initiator of learning. Therefore, this study is to examine the effect of teacher's competence on SS II student's achievement in Mathematics in Kanke L.G.A of Plateau State.

Purpose of the Study

The study is aimed at examining the effect of teacher's competence on SS II student's achievement in Mathematics, specifically, the study seeks to:

I. Determine the effect of teacher's competence on SS II student's and achievement in Mathematics.
II. Determine the effect of teachers' qualification on SS II student's achievement in Mathematics.
III. Establish the impact of teacher's knowledge of subject matter on SS II students' achievement in Mathematics.

Research Questions

For the purpose of the study, the following research questions will be raised to guide the study thus:

I. What is the effect of mathematics teacher's competence on SS II student's achievement in Mathematics?
II. What is the effect of mathematics teacher qualification on SS II student's achievement in Mathematics?
III. What is the impact of mathematics teacher knowledge of subject matter on SS II student's achievement in Mathematics?

Hypotheses

For the study, the following hypothesis were formulated and tested at 0.05 level of significance**.**

H_{O1}: Teachers Qualification has no significant effect on SS II students' achievement in Mathematics.

H_{O2}: Teacher's competence has no significant effect on SS II students' achievement in Mathematics.

H_{O3}: Teacher's knowledge of subject has no significant effect on SS II student's achievement in Mathematics.

Methodology

The design for this study is the descriptive survey design because it systematically made use of questionnaire to collect information. The population for this study comprised of all the students and mathematics teachers of secondary schools in Kanke Local Government Area of Plateau State. Statistics obtained from the area directorate in Kanke L.G.A Area office as at 2019/2020 academic session, reveals that there is a total population of (5088) Public secondary schools students and 1532 teachers across 25 schools within Kanke metropolis. Out of the population of the whole secondary school teachers and students in Kanke Local Government Area of Plateau State 180 respondents will be drawn from whom data will be collected for the study. In selecting the sample that constituted this research, the researchers adopted Simple random sampling technique in selecting the subjects for the study. For the purpose of this study, questionnaire was adopted as the instrument for data collection. The questionnaire was divided into two parts. Part one contains question items to elicit data on the personal data of the respondent's name of school, class taught, sex, and type of school, while part two contains item questions. The questionnaire is made up of 20 item questions. The question contains options of Strongly Agreed (SA), Agreed (A), Disagree (D), Strongly Disagree (SD) responses for the respondents to choose the option that best applies to them. The researcher developed 120 questionnaires for the respondents from which data will be collected for the study. To ensure that the final copy of the questionnaire adopted by the researcher is valid for the study, the researcher engage the services of the research supervisor and some Lecturers in the school of Education in constructing the questionnaire. Based on the input of the lecturers, a draft of the questionnaires was submitted to the supervisor for validation, thereafter, based on their expert inputs, well-structured questionnaires consisting of 2 parts, part A consists of demographic variables of the respondents.

To determine the reliability of the instrument, trial testing was carried out using 2 school. The instrument was administered to 10 respondents who are not part of the sample both possess the

same characteristics and after a week interval; the instrument was re-administered to the same respondents. The responses from the two administrations were subjected to test-retest reliability. The instruments were trial tested to ascertain its true consistency and dependability. The data obtained was used for the calculation of reliability of the instrument using Cronbach's Alpha (α) which was calculated at 0.87. The instruments were given to the respondents at the same time. The respondents were supervised by the researchers and some of the research assistants in the sample schools. The research questions were analyzed using Simple Percentage (%) and measure of central tendency (the mean). The mean responses were compared to the test criterion set 2.50 for acceptance or rejection. Meanwhile, the hypothesis formulated for the study was tested using chi-square of independence.

Result

Research Question 1: What is the effect of mathematics teacher's competence on SS II student's achievement in Mathematics?

Table 1

S/NO	Statement	SA	A	D	SD	Mean (X)	Decision
1.	Our teacher uses varied teaching aids, activities, and instructional materials in teaching mathematics.	80	75	20	5	3.2	Accept
2.	Our teacher utilizes technology, devices, and prepare slides, etc in teaching mathematics.	115	65	0	0	3.6	Accept
3.	My teacher uses visual aids, illustrations and multimedia to explain mathematical concepts	180	0	0	0	4.0	Accept
4.	My teacher establishes routines and procedures to maximize use of time and instructional materials in teaching mathematics.	180	0	0	0	4.0	Accept
	Overall					**3.70**	**Accept**

Table 1 shows an overall mean of 3.70 mean responses which is greater than the criterion means of 2.5. This implies that teacher's competence has significant influence on SS II student's achievement in Mathematics, since the mean is more than the criterion mean of 2.5.

Research Question 2: What is the effect of mathematics teacher qualification on SS II student's achievement in Mathematics?

Table 2

S/NO	Statement	SA	A	D	SD	Mean (X)	Decision
1.	No meaningful learning can take place in without given due consideration to teacher qualification	50	18	100	48	2.78	Accept
2.	A professional and qualified teacher can impart knowledge and stimulate learning in a classroom	85	41	50	4	3.1	Accept
3.	An experienced and qualified Mathematics teacher take into used different cognizance's among students for effective learning.	111	22	7	40	3.1	Accept
4.	Knowledge of the subject matter is a variable that influences teacher's quality and also affects student's performance in Mathematics	15	5	145	15	4.0	Accept
	Overall					**3.25**	**Accept**

Table 2 shows an overall mean of 3.25 mean responses which is greater than the criterion means of 2.5. This implies that mathematics teachers' qualification has significant effect on SS II student's achievement in Mathematics.

Research Question 3: What is the impact of mathematics teacher knowledge of subject matter on SS II student's achievement in Mathematics?

Table 3.

S/NO	Statement	SA	A	D	SD	Mean (X)	Decision
1.	Students' performance in physics is affected by the teachers skilfulness on the prescribed field of study	20	45	15	100	1.9	Reject
2.	The teachers with long years of teaching experiences were able to impact more on the students than teachers with short years of teaching experience	180	0	0	0	4.0	Accept
3.	The ability of teacher to teach is not derived only from one's academic background but it is based upon outstanding pedagogical skills acquired	180	0	0	0	4.0	Accept
4.	Teacher's qualification and teaching experience and students' achievement in Physics	180	0	0	0	4.0	Accept
	Overall					**3.48**	**Accept**

Table 3 shows an overall mean of 3.48 mean responses which is greater than the criterion means of 2.5. This implies that teachers' knowledge of subject matter has significant impact on SS II student's achievement in Mathematics.

Hypothesis One

There is no significance relationship between teachers' qualification and students' achievement in Mathematics.

Table 4 Chi-Square Analysis on the relationship between teachers' qualification and students' achievement in Mathematics.

S/N	SA+A	D+SD	TOTAL	DF	X^2-Cal	X^2-Crit.	Level of sign.	Decision
1.	71	29	100					
2.	60	40	100					
3	55	45	100	4	12.020	3.840	0.05	Rejected
4	51	49	100					
5.	68	32	100					
Total	305	195	500					

Source: fieldwork, 2020

The table above revealed that the X^2 calculated value of 12.020 is higher than the X^2 critical value of 3.840 at 0.05 level of significance. The null hypothesis is therefore rejected. This implies that there is a significant relationship between teachers' qualification/experience and students' achievement in Mathematics.

Hypothesis Two

Table 5 Chi-Square Analysis on the relationship between teachers' competency and students' performance in Mathematics.

S/N	SA+A	D+SD	TOTAL	DF	X^2-Cal	X^2-Crit.	Level of sign.	Decision
1.	71	29	100					
2.	60	40	100					
3	55	45	100	4	12.020	3.840	0.05	Rejected
4	51	49	100					
5.	68	32	100					
Total	305	195	500					

Source: fieldwork, 2020

The table above revealed that the X^2 calculated value of 12.020 is higher than the X^2 critical value of 3.840 at 0.05 level of significance. The null hypothesis is therefore rejected. This implies that there is a significant relationship between teachers' competency and students' achievement in Mathematics.

Hypothesis Three

H_{O3}: Teacher's knowledge of subject matter has no significant effect on SS II student's achievement in Mathematics.

Table 6: Chi-Square Analysis on the relationship between Teacher's knowledge of subject matter and student's performance in Mathematics.

S/N	SA+A	D+SD	TOTAL	DF	X^2-Cal	X^2-Crit.	Level of sign.	Decision
11.	65	35	100					
12	60	40	100					
13	68	32	100	4	5.891	3.840	0.05	Rejected
14	59	41	100					
15.	72	27	100					
Total	325	175	500					

Source: fieldwork, 2020

The above table revealed that the X^2 Calculated value of 5.891 is higher than the X^2 Critical value of 3.840 at 0.05 level of significance. The null hypothesis is therefore rejected. This implies that there is significant relationship between Teacher's knowledge of subject matter and student's achievement in Mathematics.

Discussion of Findings

The findings of this study revealed that there is a good relationship that exist between teachers' qualification and students' achievement in mathematics. This finding is in line with the findings of Betts et-al (2003) which suggest that teachers without teaching qualification negatively influence middle and high school students' achievement in mathematics.

The findings also revealed that there is a significant relationship that exist between teachers' competence and students' achievement in mathematics. This assertion is in line with the findings

of Wald et al (2016) which reveals that there is a stronger and positive relationship between teachers experience and students' achievement.

The third findings revealed that, teachers' knowledge of the subject has a significant effect on the students' achievement in mathematics. This agrees with Olarewaju (2016) who submitted that students' low performance in mathematics is due to the teachers' knowledge of the subject area. Adeniyi (2013) also supported the findings when he observed that the manpower development is a function of qualified teachers.

Conclusion

The enormity and consequence of poor academic achievement of students in Mathematics call for a serious concern. The more reason why scholars have not ceased to turn their research beam light on the subject matter. The learning of Mathematics depends on the way it is presented to the learner, the way the learner actively interacts with the learning experiences presented to him and the environment within which the learning takes place. It was concluded therefore that teacher's qualification has significant effect on students' academic performance in Mathematics, indicating that there are other intervening variables other than teachers which affects students' achievement in Kanke Local Government Area of Plateau State.

Recommendations

Based on the findings and conclusion drawn from this study, the following recommendations were made:

1. Teachers should be provided with technical assistance, trainings, and seminars in classroom management, use of instructional materials, and use of appropriate instructional methods to help improve the academic performance of students.
2. A study on teacher competency should be done on a regular basis. Instead of giving out supplementary reading materials, teachers should focus more on giving additional classroom activities and presenting video clips in class to make lessons more interesting to students which would eventually lead to improvement in students' performance.
3. Teachers should be encouraged to keep up-to-date and stay interested in the field of teaching to achieve advancement and cutting edge of knowledge. Staying updated with

the trends in teaching can help ensure that the teachers are teaching relevant knowledge and functioning at the current global teacher standards.

Reference

Adeniyi, P. (2013). *Effect of Electronics Artisans' Background and Competence on Science and Technology Advancement in Nigeria*. Research in Curriculum Studies, 5(1), 132- 136

Akinoso, O. (2011). *Evaluation of the implementation of senior secondary school physics curriculum in south west Nigeria* (Unpublished Ph. D thesis). University of Ado-Ekiti, Nigeria

Adeyemi, G. (2018). *Effective Teaching of Physics*. A paper presented at a seminar on effective teaching of science in Ekiti State organized by Ekiti State Ministry of Science and Technology, Ado-Ekiti

Adeniji, I. (1998). *Basic science laboratory with practical suggestions and procedures*. Lagos: Hinder

Betts, et al (2016). *How to be an effective teacher: the first days of school*. Mountain view, CA: Harry Wong publications.

Fajonyomi, (2017). *Teacher education for the 21st century. In Enoch, A. (Eds), Teacher Education and UBE. Jos*: Saniez Publications.

Ferdinand, (2017). *Effect of guided inquiry and expository teaching methods on the achievement in and attitude to biology of students of different scientific literacy.* [Online]Available: http:/www.pepreal.cl/FIE/pdf/lopbc /nwagbo.pdf

Harris & sass. (2016). Pattern of enrolment in Chemistry and students' education of contributory factors in Nigerian college of education. *African Journal of Educational Research* vol.9 nos 1 and 2:136-146 Published by the Department of Teacher Education, University of Ibadan, Nigeria.

Jordan,Mendroand Weersinge. (2017). Influence of shortage of human resources on the effective instruction of mathematics in secondary schools. *The Journalof WCCI Nigeria Chapter Forum*, 4 (2), 176-184

Mud Car, (2016). Education for social reconstruction: London, Macmillan. (2017). *Chemistry for College Students and Teachers*. Published by Library Department Federal College of Education, Zaria

Majason, (1995). *The Agonies of Nigerian Teachers NUT, Friend or Foe? African Social and Environmental Studies Programme (ASESP) 1994*). Chemistry Curriculum and Teaching Resources Book for African. Kenya: African Chemistry and environmental Programmed

Nwagbo, (2015). *Fundamentals of Chemistry for Schools and Colleges*, Abuja:Tonem Publicity & Publications Ltd.

Nkwodimatis, (2017). *Effect of Electronics Artisans' Background and Competence on Scienceand Technology Advancement in Nigeria*. Research in Curriculum Studies, 5(1), 132-136

Ngoda, (2018). *Trends in teachers' education*. In U.M.C. Ivowi (Ed), Curriculum Development in Nigeria. Ibadan. Sam Bookman

Olarewaju, (2016). *Evaluation of the implementation of senior secondary school physics curriculum in south west Nigeria* (Unpublished Ph. D thesis). University of Ado-Ekiti, Nigeria

Ogbazi, A. (2017). *Effective Teaching of Physics*. A paper presented at a seminar on effective teaching of science in Ekiti State organized by Ekiti State Ministry of

Science and Technology, Ado-Ekiti

Omole, (2013). *Reviving higher education relevance in Nigeria. A paper presented at the 3rd Faculty of Week and Annual National Conference, Faculty of Education*. University of Maiduguri on the theme Higher education reforms in Nigeria from 26th to 27th September.

Ogunkola, (2018). *Women educational administration: A research profile.* The Education Forum, 59, 61-67.

Olatoye, (2013). *Towards improving skill acquisition during students' industrial work experience scheme programme*. National Association of Women in Academics, 1(1), 46- 54.

Wald Et Al. (2013). *Women educational administration: A research profile.* The Education Forum, 59, 61-67.