

**EFFECT OF TEACHER QUALITY ON STUDENT PERFORMANCE IN MATHEMATICS  
IN PRIMARY 6 NATIONAL EXAMINATION: A SURVEY OF PRIVATE PRIMARY  
SCHOOLS IN GASABO DISTRICT, KIGALI CITY, RWANDA**

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**Abstract**

*The aim of this study was to establish the relationship between teacher quality and pupils' performance in mathematics in primary 6 national examinations in private schools in Gasabo District, Kigali City, Rwanda between the years 2012 and 2014, inclusive. The target population comprised of 1346 respondents out of which 75 were mathematics teachers, 31 head teachers from all the 31 private primary schools in Gasabo District, Rwanda and 1240 primary 6 pupils. The resulting sample size was 63 mathematics teachers, 28 head teachers and 302 pupils calculated from the total population using Yamane's simplified formula for determining a sample size. The sample size was selected using Multi stage Random Sampling technique. Five teacher qualities were studied: teacher qualification, teacher experience, communication skills, teaching practice and teacher preparedness. The study applied correlation comparative research design. Questionnaire and interview guides were used as data collection instruments. Data was analyzed using frequencies, percentages, standard deviations, weighted means and Multiple Regression Analysis. Interview guide were analyzed using content analysis. Quantitative data was analyzed using Statistical Package for the Social Sciences Version 21.0 (SPSS V.21.0) software as a tool of analysis. From this study, it was noted that teachers' with effective teaching practice register a higher student performance as opposed to teachers who resort to ineffective teaching practice. Additionally, teachers' with more teaching experience impact pupils performance than fresh graduates. Likewise, teachers' communication skills register a higher pupil's performance. There was improved performance in mathematics in those schools where the teachers were committed to their duties, had positive attitude towards mathematics, prepared well before going to teach, used plenty of teaching relevant resources, and engaged their pupils through evaluation and assessment.*

**Key words:** Teacher quality, Teacher Experience, Teaching practice, Communication skills, Teacher Preparedness

## 1.0 Introduction

This study is generally about how teacher quality affects students performance in mathematics within private primary schools in Gasabo District, Kigali City, Rwanda.

### 1.1 Background of the Study

“Teacher quality is widely recognised by policymakers, practitioners, and researchers alike to be the most powerful school-related influence on a child’s academic performance.” (Motoko, Gerald, LeTendre & Scribner, 2007, p. 369). In addition Fenster (2014) maintains that a teacher who is highly effective improves both students’ academic learning in the short-term and their long-term quality of life. School is where people go to acquire knowledge, learn skills, and develop values that will make them productive citizens and help them grow to their fullest potential as human beings (Wong & Wong, 2009). The quality of the teacher in any school setting, is claimed to be the most critical component for improving student achievement and closing achievement gaps. Leigh and Mead (2005), argue that the knowledge and skills of teachers are the most important factors influencing childrens’ learning. Therefore teacher quality is considered a means towards this end. Omo (2011), notes that the dramatic effects that teachers have on students’ achievement are largely undisputed. Goe (2007), maintains that teacher quality influences student performance and highlights academic qualification and experience as some of the qualities of a teacher. A highly effective teacher improves both students’ academic learning in the short-term and their long-term quality of life (Goe & Stickler, 2008). The veracity of this statement has been supported by empirical information but what has not been clear from these empirical findings is the exact characters or qualities that impact student performance. Several studies that have been carried out on various factors affecting student performance, offer deeper and insightful reflection on the topic. Irfan & Shabana (2012) have identified several factors that impact on student performance. They include: communication, proper guidance, and learning facilities.

Teachers are the most important resource that a school should have to achieve greater and better results. Darling-Hammond (2000) maintains that teacher preparation and certification are the strongest factors contributing to students’ achievement in reading and mathematics. Kasiisa & Bakaluba (2013) concluded that there is significant relationship between teachers’ qualifications and pupils’ academic performance in the primary schools in eastern Uganda. Based on their findings, they recommended that experienced teachers with professional qualifications should teach Social Studies in Eastern Uganda. (Kosgei, Jairo, Odhiambo & Ayugi, 2013) conducted a study in Nandi, Kenya to establish the relationship between teacher quality and student achievement. They observe that teacher experience has significant impact on students performance but also note that teacher qualification has no much relationship with students’ academic achievement.

This study sought out to investigate the impact of five qualities of a teacher, namely: teacher experience, teaching practices, teacher qualification, teacher preparedness and communication skills on mathematics in primary 6 National Exams, within private primary schools in Gasabo District of Kigali City, Rwanda. The study was confined to data available within the years 2012 -2014, inclusive.

## 1.2 Statement of the Problem

Poor Mathematics performance is not unique to Rwanda as research has made it clear. According to (Baldi *et al* 2007.p. 24), the “average U.S. score in mathematics literacy was 474 on a scale from 0 to 1,000, lower than the OECD average score of 498”. Mbugua, Kibet, Muthaa & Nkonke (2012) mentioned that mathematics performance in Baringo District, Kenya has persistently been poor. Poor attitude by teacher was highlighted as one of the cause for poor performance in mathematic. Rwanda, in its Vision 2020 agenda, acknowledges the fact that education has been declining due to poor caliber of teachers (MINEDUC, 2007. Data collected by Rwanda Education Statistics (MINEDUC 2012) outlines the performance in primary schools. Mathematics was the lowly performed in 2010 and the second from last in 2009. While scholars like Nsanzabiga (2013), Mporananayo(2015) and others have researched on factors affecting student performance, little has been said about teacher quality in relation to pupils’ performance in Rwanda. Therefore the research problem is an analysis of the effect of teacher quality on pupils’ performance in mathematics in Primary 6 National Exams, within private primary schools in Gasabo District of Kigali City, Rwanda. The study was confined to data available within the years 2012 -2014, inclusive.

## 1.3 Objectives of Study

The objectives are divided into two parts namely: General objectives and specific objectives.

### 1.3.1 General Objective

The general objective of the study was to establish the relationship between teacher quality and students’ performance in mathematics in national examinations in private primary schools of Gasabo District, Kigali City, Rwanda between the years 2012 and 2014, inclusive.

### 1.3.2 Specific Objectives

- i. To determine the quality of mathematics teachers within private primary schools in Gasabo District, Kigali City, Rwanda between the years 2012 and 2014, inclusive.
- ii. To evaluate students performance in mathematics in national examinations within private primary schools in Gasabo District, Kigali City, Rwanda between the years 2012 and 2014, inclusive.
- iii. To determine how teacher quality affect students’ performance in National Examinations within private primary schools in Gasabo District, Kigali City, Rwanda between the years 2012 and 2014, inclusive.

## 1.4 Research Questions

- i. What constitutes the quality of mathematics teachers within private primary schools in Gasabo District, Kigali City, Rwanda between the years 2012 and 2014, inclusive?
- ii. What is the status of students’ performance in mathematics in national examinations within private primary schools in Gasabo District, Kigali City, Rwanda between the years 2012 and 2014, inclusive?
- iii. To what extent does teacher quality affect students’ performance in mathematics in national examinations within private primary schools in Gasabo District, Kigali City, Rwanda between the years 2012 and 2014, inclusive?

## 1.5 Significance of the Study

This study would be a valuable tool of reference to teachers who wish to undertake a self-evaluation in terms of their effectiveness and efficiency in teaching. This would help improve the teaching quality leading to improved student performance. Besides, primary school pupils also stand to be beneficiaries of this study given that they are the focal point in the dependent variable. The results of these findings would impact pupils performance thereby prompting necessary measures towards improving their performance. Furthermore, it would serve as a benchmark for private primary school proprietors and investors in recruitment, retention and dismissal processes. In addition, this study would guide school inspectors to come up with appropriate parameters in the process of teacher assessment and evaluation. Finally, the Ministry of Education (MINEDUC) would use this study as a guide in formulating relevant education policy regarding teacher quality and pupils performance.

## 2.0 Review of Related Literature

### 2.1 Empirical Review

The quality of the teacher, in any school setting is the most critical component for improving students achievement and closing achievement gaps (Wong & Wong, 2009). Review of empirical literature focuses on empirical and analytical review about teacher experience, teacher highest level of education, teacher preparedness, communication skills and teaching practice and the relationship with student performance.

#### 2.1.1 Teacher Experience and Students Performance

Dial (2008) conducted a study to examine whether years of teaching experience and teacher's degree level have an effect on overall achievement of students on the communication arts and mathematics sections of the Missouri Assessment Program. Descriptive statistics and factorial ANOVA was used in this study. Data was analysed from both the communication arts and mathematics sections of the Missouri Assessment Program exam from the 2005-06 and 2006-07 school years. Whereas the overall results indicated that years of experience, as well as the interaction between years of experience and degree level, had an effect on student achievement in both communication arts and mathematics inconclusive results indicated teacher degree level alone had no effect on student achievement. The study recommended that further research could be continued using future test score data on the basis of the results.

Kimani, Kara & Njagi (2013) investigated the relationship between selected teachers' demographic characteristics and classroom instructional practices and students' academic achievement in selected secondary schools in Nyandarua County, Kenya. Participants in the study were drawn from one hundred and fifty three teachers selected randomly from eighteen schools in three districts in the County. Based on their aggregate performance in Kenya Certificate of Secondary Education (KCSE) in the last three years, the schools were categorized as above average, average, and below average. Two schools per district were selected in each category. The researchers developed questionnaires to collect while linear regression and One-way ANOVA were used to test the relationship between the selected variables and performance in KCSE. The study revealed that teachers' age, gender, professional qualifications and teaching experience had significant relationship with academic achievement. In contrast, teachers' job group had significant and positive relationship with students' academic achievement in secondary schools.

Kosgei *et al* (2013) in their study in Nandi District, Kenya to establish the relationship between teacher quality and student achievement. The study was guided by Education Production Function theory (EPF) which connects student academic achievement to teacher characteristics. The

population comprised of teachers of all 26 public secondary schools in Nandi District, Kenya. A causal comparative research design was applied in the study. A questionnaire was used for data collection which was analyzed using descriptive and inferential statistical techniques. He observes that teacher experience has significant impact on students performance but also notes that teacher qualification has no much relationship with student achievements.

Ladd and Sorensen (2014) observed that teacher's experience contributes to several non-test score outcomes such as: amount of time spent reading for pleasure and completing homework, number of days absent, and number of repeated disruptive offenses. Partly dependent on a student's home or community environment, these behaviours reflect important facets of learned motivation, perseverance, and self-control that largely influence the future success of middle school students of North Carolina, in the United States. The results of their findings reveal a higher test-score for middle school teachers of math and English Language Arts (ELA). Results notwithstanding, the study group involved middle school students as opposed to elementary schools that informs the interest of the current research.

### **2.1.2 Teacher Qualification and Students Performance**

According to Darling-Hammond (2000), certification status is a measure of teacher qualifications that combines aspects of knowledge about subject matter and about teaching and learning. Ashton & Crocker (1986); Evertson, Hawley, & Zlotnik (1985); Greenberg (1983); Haberman (1984); and Olsen (1985) as cited by Darling- Hammond (2000) maintain that fully prepared and certified teachers are better rated and more successful than teachers without this preparation. Evidence is drawn from research that spans across the last 30 years. Such evidence dispels populist beliefs that teaching is best learned, to the extent that it can be learned at all, by trial and error on the job. Hammond (2000) reviewed data from a policy survey covering 50 states. The aim was to examine the ways in which teacher qualifications and other school inputs are related to student achievement across states. The findings of both the qualitative and quantitative analyses suggest that policy investments in the quality of teachers may be related to improvements in student performance.

Hill, Rowan & Loewenberg (2005) conducted a study to explore whether and how teachers' mathematical knowledge for teaching contributes to gains in students' mathematics achievement. A linear mixed-model methodology was used in which first and third graders' mathematical achievement gains over a year were nested within teachers, who in turn were nested within schools. It was concluded that teachers' mathematical knowledge was significantly related to student achievement gains in both first and third grades after controlling for key student- and teacher-level covariates. Based on the research findings, it was recommended that policy initiatives should be designed to improve students' mathematics achievement by improving teachers' mathematical knowledge.

Darling-Hammond, Holtzman, Gatlin, and Heilig (2005) are cognizant of the debate surrounding questions raised by the utility of teacher education with particular focus on whether certified teachers are generally more effective than those who have not met the testing and training requirements for certification. Another question raised by the debate is whether some candidates with strong liberal arts backgrounds might be at least as effective as teacher education graduates. These questions are examined in a study using a large student-level data set from Houston, Texas that links student characteristics and achievement with data about their teachers' certification status, experience, and degree levels from 1995-2002. Data was collected to ascertain the effectiveness of Teach for America (TFA) recruits from selected universities who receive a short-term training before they begin teaching compared to experienced certified teachers. A series of regression analyses focusing on 4th and 5th grade student achievement gains on six different reading and

mathematics tests was done over a six-year period. It was found out that certified teachers consistently produce stronger student achievement gains than do uncertified teacher. Additionally, the study concluded that teachers' effectiveness strongly related to the preparation the teachers had received for teaching.

In a study to assess the relationship between teacher certification and student performance, Kane *et al* (2007) used six years of panel data on students and teachers to evaluate the effectiveness of recently hired teachers in the New York Public schools. Upon classification and analysis of teachers based on their certification status in their year of hire, research findings revealed that Certified, uncertified, international, and alternative certified (AC) teachers differ along a number of observable dimensions. For instance, the fraction of teachers who are black or Hispanic was found to be lower among regularly certified teachers and TFA corps members (about 20%) than among Teaching Fellows (30%) uncertified teachers (49%), or international teachers (48%). Consequently, there is more likelihood that certified teachers and international recruits will have graduate education than other groups. Based on the research findings, it was revealed that on average, the initial certification status of a teacher has small impacts on student test performance. There were large and persistent differences among teachers with the same experience and certification status. Such evidence suggested that classroom performance during the first two years is a predictive basis of a teacher's future effectiveness.

A descriptive study using post-hoc dataset was carried out in Nigeria to examine the number of qualified teachers and its relationship to students' academic performance in public secondary schools. Twenty-one (21) public secondary schools, one in each Local Government Areas (LGA) from a population of thirty-one (31) LGA in the Osun State, Nigeria were sampled. The Senior School Certificate Examination results from 2000/01 to 2004/05 data were analyzed using ANOVA and Spearman rank correlation coefficient to test the three operational hypotheses (Akinsolu, 2010). Findings of this study revealed that teachers' qualifications, experience and teacher-student ratio were significantly related to students' academic performance. The researcher recommended that the findings could be used to guide planners about the need for hiring qualified teachers for effective teaching and learning in secondary schools in Nigeria.

Yara & Otieno (2010) observed that in spite of various challenges facing the Kenyan educational system, it is still evolving steadily. The study looked at the effect of teaching/learning resources on academic performance in secondary school mathematics in Bondo district of Kenya. A descriptive survey design was adopted with a total of 405 senior four students as the population of the study. A random selection was applied on two hundred and forty two (242) students drawn from nine schools out of 24 schools in the three divisions of Bondo districts. Using multiple regression analysis to analyse data, it was found that there was a positive correlation among the eight independent variables and the dependent. The study recommends that review of curriculum, in-servicing of trained teachers, recruiting more competent teachers, motivation of learners, improved government support to education, good teaching methods, improved students-book ratio and better remuneration of teachers are factors that the government and all stakeholders should pay more attention to in order to improve performance in mathematics.

Baumert *et al* (2010) noted concerns raised in both the United States and Europe, about whether pre-service and in-service training succeeds in equipping teachers with the professional knowledge they need to deliver consistently high-quality instruction. The study investigates the importance of teachers' content knowledge and pedagogical content knowledge for high-quality instruction and student progress in secondary-level mathematics. The study conducted in Germany over a period of one year sampled Grade 10 classes and their mathematics teachers. Multilevel structural equation models revealed that there was a substantial positive effect of pedagogical content knowledge on

students' learning gains that was mediated by the provision of cognitive activation and individual learning support.

Makewa, Role, Too & Kiplagat (2012) investigated teacher-related factors associated with performance in mathematics in public day primary schools in Nandi Central district, Kenya. A total of seventy-four (74) mathematics teachers participated in the study. Sampling techniques used to obtain the samples for the study included: stratified, random, and purposive. A questionnaire was used to collect data which had been validated and subjected to a pilot study to establish its reliability. Descriptive statistics and inferential statistic (t-test) were used to analyze the data. Based on the findings of the study, a majority of mathematics teachers in Nandi Central district public day primary schools were found to be trained with a teaching experience of between 11–20 years. An average rating was given on the mathematics teachers' use of learning resources, teaching methodology, teacher preparation, commitment, and assessment and evaluation. Moreover, teachers in high performing schools rated the attitudes toward mathematics, teaching methodology, commitment, preparation, and use of learning resources, evaluation and assessment higher than their counterparts in the low performing schools. It was recommended from the study that future research should link research on teacher preparation with teacher induction with professional development.

Kasiisa & Tamale (2013) studied the impact of teacher's qualification on the performance of Primary social studies in Eastern Uganda. A cross-sectional survey design was adopted with a sample size of 128 Senior Primary Schools social studies teachers. The research findings revealed that students taught by teachers with higher qualifications performed better than those taught by teachers with lower qualifications. Based on the research findings, it was recommended that experienced teachers with professional qualifications should teach Social Studies.

Abe (2014) studied the effect of teachers' qualification on students' performance in mathematics. Three hundred students were randomly selected from ten schools out of sixteen schools on purpose in Ikere Local Government Area of Ekiti State. The criterion for the selection of mathematics teachers was based on teacher qualification. T-test statistic was used to test the three hypotheses in the study. According to the results, there was a significant difference in the performances of students taught by professional teachers. The difference was also registered between students taught by NCE (Nigeria Certificate in Education) teachers and B.Sc Ed. Teachers and also between B.Sc teachers and B.Sc Ed. teachers. In its recommendation the study suggested that only qualified mathematics teachers should be allowed to teach mathematics at the secondary school level. Furthermore, the study recommended that holders of lesser qualifications such as Nigeria Certificate in Education (NCE) be allowed to proceed in their education either through part-time or study leave. In the same vein the study recommended that teachers without teaching qualification should be advised to pursue their Post Graduate Diploma in Education (PGDE). This may improve their teaching method in order to improve the performance of students in mathematics.

Mosha (2014) investigated the factors affecting students' performance in English language subject in Zanzibar's Secondary Schools using Bloom's (1982) model of evaluation as a framework in the study. This study investigated the factors affecting students' performance in English language subject in Zanzibar Secondary Schools. The study employed qualitative and quantitative approaches. Data were collected using interviews, classroom observation, questionnaire and documentary review. Result of the study reveals that students were highly motivated to learn English for future expectations such as local and international communication, academic advancement and employment prospects. However, students' performance was affected by shortage of English teachers and absence of teaching and learning materials.

The findings revealed that due to incompetence from untrained and un-qualified teachers, cases of unprofessional malpractices such as skipping topics deemed difficult were prevalent. In addition to this a host of other factors such as infrequent use of English language at school and home, large class size, teachers' responsibilities, poor conducive teaching and learning environment in the classrooms, limited home support environment and poverty had negative influence on proficiency in English. Part of the study's recommendation is the need to offer in-service teacher training to equip teachers of English with competent skills in the subject.

Akiba *et al* (2003) collected data from 46 countries on Trends in International Mathematics and Science Study. The results showed an opportunity gap in students' access to qualified teachers between students of high and low socioeconomic status (SES) was among the largest in the world against the backdrop of a similarity between the national level of teacher quality in the United States and the international average. Cross-national analyses revealed that the countries with better teacher quality produced higher mathematics achievement. However, larger opportunity gaps in access to qualified teachers did not predict larger achievement gaps between high-SES and low-SES students cross-nationally. The analyses provide empirical, cross-national evidence of the importance of investing in teacher quality for improving national achievement. The study recommended that National policies and practices related to improving teacher quality appear to be a promising area for future research to identify how other countries have achieved both excellence and equity in student achievement (Akiba *et al*, 2003).

### 2.1.3 Teacher Preparedness and Student Performance

There is enough evidence of research documented towards this end. Boyd *et al.* (2008), made an attempt in a paper to estimate the effects of features of teachers' preparation on teachers' value-added to student test score performance in math and English Language Arts. Results indicate variation across preparation programs in the average effectiveness of the teachers supplied to New York City schools. In particular, teachers in their first year appear to be beneficiaries of preparation directly linked to practice. The most likely explanation to this scenario is the "freshness" of knowledge and general professional alertness that allows for application of the theoretical knowledge from college to the working environment. The underlying revelation is that newly appointed teachers tend to prepare lessons meticulously in comparison to older counterparts. In return, it results into effective delivery of knowledge to an equally enthusiastic group of learners.

Makewa *et al* (2012), investigated teacher-related factors associated with performance in mathematics in public day primary schools in Nandi Central district, Kenya. Seventy-four (74) mathematics teachers participated in the study. Samples for the study were collected using stratified, random, and purposive sampling techniques. Data collection was done using questionnaire which had been validated and subjected to a pilot study to establish its reliability. Each subscale of the questionnaire yielded a Cronbach's alpha reliability coefficient of 0.60 and higher.

The study employed the descriptive statistics and inferential statistic (t-test) to analyze gathered data. The results from the study revealed that the majority of mathematics teachers in Nandi Central district public day primary schools were trained with a teaching experience of between 11–20 years. However, they gave an average rating on the mathematics teachers' use of learning resources, teaching methodology, teacher preparation, commitment, and assessment and evaluation. In addition, teachers in high performing schools rated the attitudes toward mathematics, teaching methodology, commitment, preparation, and use of learning resources, evaluation and assessment higher than their counterparts in the low performing schools. The study recommended that, future



research ought to link research on teacher preparation with teacher induction with professional development.

#### **2.1.4 Teaching Practices and Students Academic Performance**

Goe & Stickler (2008) defined classroom practices a teacher employ, as the ways in which teachers interact with students and the teaching strategies they use to accomplish specific teaching tasks, such as: “Aligning instruction with assessment, communicating clear learning objectives and expectations for student performance, providing intellectual challenge, allowing students to explain what they are learning, using formative assessment to understand what and the degree to which students are actually learning, offering active learning experiences, subscribing to cohesive sets of best teaching practices”(Goe & Stickler , 2008 ).

Wenglinsky (2001) explored the link between classroom practices and student academic performance by applying multilevel modeling to the 1996 National Assessment of Educational Progress in mathematics. The study revealed that the effects of classroom practices, when added to those of other teacher characteristics, are comparable in size to those of student background. The findings suggested that teachers can contribute as much to student learning as the students themselves. Schools that do have a significant mass of active teachers can add value to their students hence they reach higher levels of academic performance than those students otherwise would reach (Wenglinsky, 2001).

Kane et al (2010) combined data from classroom observations of teaching practices and measures of teachers’ ability to improve student achievement. The study revealed that observation measures of teaching effectiveness were substantively related to student achievement growth and that some observed teaching practices predicted achievement more than other practices. The study recommended individual teacher development efforts, and the design of teacher evaluation systems. Sarwaret *al* (2012) conducted study whose main purpose was to identify the effect of teaching practices and student motivation on student achievement in mathematics. Two principal component analyses (PCA) were conducted in the study. The first PCA was conducted to cluster 22 items that were related to teaching practices, in which the items were selected from a questionnaire that was administered to the teachers. The second PCA was conducted to cluster 11 items related to student motivation, in which the items were selected from a questionnaire that was administered to the student. The results from the first PCA revealed that the extraction of four components was found to be related to several frameworks found in the literature on teaching strategies. For the second PCA, two components were extracted which were related to student motivation. The extracted components were then used as two sets of independent variables in a hierarchical regression analysis in order to study their effect on student achievement in mathematics. The study found that four teaching practice components and the two student motivation components were considerably related to student academic achievement in mathematics on the large-scale assessment.

#### **2.1.5 Teacher Communication Skills and Students Performance**

Omo (2011) maintains that the quality of teachers is strongly correlated to students’ performance. The study presented evidence on teacher quality impact on student achievement with a sample of 400 students and 200 teachers from 40 purposively selected secondary schools in Ibadan metropolis in Nigeria. The schools were classified into four categories including: public elite schools; public non-elite schools; private elite schools and private non-elite schools. A composite measure of the quality of the teachers covering qualification, experience, patience, creativity, and communication skills was utilized. The students’ performance was measured by their scores in the two compulsory subjects of English Language and Mathematics in the general school leaving certificate

examination. Descriptive and inferential statistical analysis was used to analyze the data. The results revealed that the observed variations in the students' performance across the four categories of the schools were significantly explained by the differences in the quality of the teachers. The study concluded that the quality (qualification, experience, patience, creativity and communication skills) of teachers matters for student performance in schools.

Sharifirad *et al* (2012) considering the significant role of academic members in the educational process, conducted a study on the knowledge, attitude and performance of academic members of School of Health, Isfahan University of Medical Sciences with regard to effective communication skills. A descriptive–analytical study was used to analyze data, where all academic members of the School of Public Health, Isfahan University of Medical Sciences, were studied during the second academic semester of 2006-2007. The data were collected by a valid and reliable three-part questionnaire including knowledge (8 questions and maximum score of 8), attitude (31 questions and maximum score of 155) and observational communication skills checklist (20 questions and maximum score of 20). The study found that the mean knowledge score of studied people in terms of communicational skills, attitude and performance were 4.1 out of 8, 114.4 out of 155 and 16.3 out of 20, respectively. It was concluded that though the information of the participants of the study in terms of communication skills was not sufficient, there seemed to have a positive attitude and relatively acceptable performance in communication skills.

## 2.2 Conceptual Framework

### Independent Variables (Teacher Quality)

1. Teaching practices
2. Teachers  
Communication skills
3. Teacher Preparedness
4. Teacher  
Qualifications
5. Teacher Experience

### Dependent Variable (Students Performance)

Scores of pupils in mathematics in primary 6 (P6) National Exam for Year 2012, 2013 and 2014

### Intervening Variables

1. Fringe Benefits
2. Environmental factors
3. Social-Economic factors
4. Laws of Rwanda
5. Organizational procedures in the school

Figure 2.1: Conceptual Framework

Source: Reaserchers, Preliminary interpretation

### 3.0 Research Methodology

#### 3.1 Research Design

A correlation comparative research design was used to carry out this study.

#### 3.2 Target Population

The target population included 1240 students, 75 teachers of mathematics and 31 school head teachers from the schools. All respondents were drawn from the sampled Private Primary schools in Gasabo District, Kigali City. Gasabo District, Kigali City, has a total of 31 (thirty one) primary private schools.

#### 3.3 Data Collection Instruments

The data collection instruments used was a structured questionnaire and interview guide.

### 4.0 Research Findings and Discussions

#### 4.1 Presentations of Findings

Teacher's quality was measured by evaluating the teacher's academic qualifications, teachers experience, teacher's preparedness, teacher's communication skills, and teacher's practices. The findings are as presented.

##### 4.1.1 Academic Qualification of the Teachers

The research sought to evaluate the academic qualification of the respondents that participated in the study. The findings are as presented in Table 4.1.

Table 4.1: Academic Qualification of the Teachers

Academic Qualification	F	P
Diploma/Certificate	24	50.00%
Bachelors	24	50.80%
Masters	0	0.0%
<b>Total</b>	<b>48</b>	<b>100.0%</b>

#### Key:

Table 4.1 indicates that out of 48 mathematics teachers 24 (50.00%) have a Diploma or Certificate, 24 (50.00%) have a Bachelor's degree while none of the mathematics teacher had a Master's degree. All the respondents that participated in the study seemingly have the basic education required to be a primary school teacher.

##### 4.1.2 Teaching Experience in Mathematics

Majority of the mathematics teachers that participated in the study have been teaching mathematics as a subject for more than 6 years. Of the 48 teachers that participated in the study 1 (2.1%) has taught mathematics less than a year, 2(4.2%) have taught mathematics between 1 and 2 years, 8(16.7%) have taught mathematics between 3 and 5 years, 12(25.0%) have taught mathematics between 6 and 7 years, 13(27.0%) have taught mathematics between 11 and 15 years while 12(25.0%) teachers indicated to have taught mathematics for more than 15 years..

### 4.1.3 Teachers Preparedness

The mathematics teachers were requested to indicate their level of teaching preparedness. The results of the finding are as indicated in Table 4.2.

Ranking and frequency (%)

	N	SD=1	D=1	N=3	A=4	SA= 5	WM	Std Dev
I always conduct each mathematical task to be taught by analyzing	48	0 0%	0 0%	2 4.20%	23 47.90%	23 47.9%	4.44	0.58
I plan and prepare lessons my lesson ahead of time effectively	48	1 2.10%	1 2.10%	0 0%	14 29.20%	32 66.70%	4.52	0.97
I always prepare the logical sequence for instruction for all my lessons	47	0 0%	0 0%	1 2.10%	24 50.00%	22 45.80%	4.35	0.84
I always prepare my lessons to suit the learners' capabilities and interests	48	0 0%	0 0%	4 8.30%	15 31.30%	29 60.40%	4.52	0.65
I always specify each lesson objectives aimed to be achieved	48	0 0%	0 0%	0 0%	12 25.0%	36 75.00%	4.75	0.44
I capitalize on using gestures and facial expressions when talking in class	46	0 0%	1 2.10%	7 14.6%	11 22.90%	27 56.30%	4.20	1.20
I establishes eye contact during conversations with my students	47	1 2.1%	0 0%	1 2.1%	17 35.40%	28 58.3%	4.42	0.99

**Key:** SD= Strongly Disagree, D=Disagree, N= Neutral, A= Agree, SA=Strongly Agree, P: Percentage, WM: Weighted Mean, Std Dev: Standard Deviation, (Std Dev <0.5-Respondents responses crowded around the mean), (Std Dev >0.5 – Respondents responses dispersed on the responses

Source: Survey Data

The teachers were requested to indicate if they conduct each mathematical task to be taught and analyzing the contents. The majority 23 (47.9.6%) disagree and 23 (47.9%) strongly agree that they always conduct teach mathematical task to be taught by analyzing the contents This was also indicated with a strong mean of 4.44 and a weak heterogeneous standard deviation of 0.58, indicating few divergent views of the teachers. The teachers were requested to indicate if they plan lessons ahead of time effectively. The majority 14 (29.2%) agree and 32 (66.7%) strongly agree that they plan lessons ahead of time effectively. This was also indicated with a strong mean of 4.52

and a heterogeneous standard deviation of 0.97, indicating wide divergent views of the teachers. The teachers were requested to indicate if they always prepare their lessons to suit the learner's capabilities and interests. The majority 24 (50.0%) agree and 22(45.8%) strongly agree that they always prepare their lessons to suit the learner's capabilities and interests. This was also indicated with a strong mean of 4.35 but with a heterogeneous standard deviation of 0.84, indicating wide divergent views of the teachers.

The teachers were further requested to indicate if they specify each lesson objectives aimed to be achieved. The majority 12(25.0%) agree and 36(75.0%) strongly agree that they specify each lesson objectives aimed to be achieved. This was also indicated with a strong mean of 4.75 and a homogenous standard deviation of 0.44, indicating a joint agreement in the views of the teachers. The teachers were requested to indicate if they capitalize on using gestures and facial expressions when talking in class. The majority 11(22.9%) agree and 27(56.3%) strongly agree that they capitalize on using gestures and facial expressions when talking in class. This was also indicated with a strong mean of 4.20 but with a heterogeneous standard deviation of 1.20, indicating wide divergent views of the teachers. The teachers were requested to indicate if they establish eye contact during conversations with students. The majority 17(35.4%) agree and 28(58.3%) strongly agree that they establishes eye contact during conversations with students. This was also indicated with a strong mean of 4.42 but with a heterogeneous standard deviation of 0.99, indicating wide divergent views of the teachers

#### 4.1.4 Teachers Communication Skills

The mathematics teachers were requested to indicate their communication skills. The results of the finding are as indicated in Table 4.3

	Ranking and frequency (%)						WM	Std Dev
	N	SD=1	D=2	N=3	A=4	SA=5		
I capitalize on using gestures and facial expressions when talking in class	46	0 0%	1 2.10%	7 14.60%	11 22.90%	27 56.30%	4.39	0.83
I establishes eye contact during conversations with my students	47	1 2.10%	0 0%	1 2.10%	17 35.40%	28 58.30%	4.51	0.75
I always make my students feel that I respect their opinions	46	0 0%	0 0%	16 33.30%	0 0%	30 62.50%	4.61	0.53
I am very patient when listening to the student's thoughts.	48	0 0%	0 0%	0 0%	24 50.00%	24 50.00%	4.50	0.51

I always ensure that I take care when making criticism without making the students get upset	48	0	0	7	17	24		
		0%	0%	14.60%	35.40%	50.00%	4.35	0.73
I explain the reasoning behind an idea when teaching mathematics	48	0	0	2	20	26		
		0%	0%	4.20%	41.70%	54.20%	4.50	0.58
I always present my mathematical lessons in a manner that stimulates the learners to want to learn the new information.	48	0	0	1	14	33		
		0%	0%	2.10%	29.20%	68.80%	4.67	0.52
I always present the mathematics content so as to interest and motivate individual learners	48	0	0	2	31	15		
		0%	0%	4.20%	64.60%	31.30%	4.27	0.53

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**Key:** SD= Strongly Disagree, D=Disagree, N= Neutral, A= Agree, SA=Strongly Agree, P: Percentage, WM: Weighted Mean, Std Dev: Standard Deviation, (Std Dev<0.5-Respondents responses crowded around the mean), (Std Dev >0.5 – Respondents responses dispersed on the responses  
Source: Survey Data

The teachers were requested to indicate if they capitalize on using gestures and facial expressions when talking in class. The majority 11 (22.9%) agree and 27 (56.3%) strongly agree that they capitalize on using gestures and facial expressions when talking in class. This was also indicated with a strong mean of 4.39 but with a heterogeneous standard deviation of 0.83, indicating wide divergent views of the teachers. The teachers were requested to indicate if they establish eye contact during conversations with my students. The majority 17 (35.4%) agree and 28 (58.3%) strongly agree that they establishes eye contact during conversations with students. This was also indicated with a strong mean of 4.51 but with a heterogeneous standard deviation of 0.75, indicating wide divergent views of the teachers. The teachers were requested to indicate if they always make their students feel that they respect their opinions. The majority 30 (62.5%) strongly agree that they always make students feel that they respect their opinions. This was also indicated with a strong mean of 4.61 but with a heterogeneous standard deviation of 0.53, indicating wide divergent views of the teachers.

The teachers were requested to indicate if they are very patient when listening to the student's thoughts. The majority 24(50.0%) agree and 24(50.0%) agree that they are very patient when listening to the student's thoughts. This was also indicated with a strong mean of 4.50 but with a heterogeneous standard deviation of 0.51, indicating wide divergent views of the teachers. The teachers were requested to indicate if they ensure that they take care when making criticism without

making the students get upset. The majority 17(35.4%) agree and 24(50.0%) agree that they take care when making criticism without making the students get upset. This was also indicated with a strong mean of 4.35 but with a heterogeneous standard deviation of 0.73, indicating wide divergent views of the teachers. The teachers were requested to indicate if they explain the reasoning behind an idea when teaching mathematics. The majority 20(41.74%) agree and 26(54.2%) strongly agree that they explain the reasoning behind an idea when teaching mathematics. This was also indicated with a strong mean of 4.50 but with a heterogeneous standard deviation of 0.58, indicating wide divergent views of the teachers. The teachers were requested to indicate if they always present mathematical lessons in a manner that stimulates the learners to want to learn the new information. The majority 14(29.2%) agree and 33(68.8%) strongly agree that they always present my mathematical lessons in a manner that stimulates the learners to want to learn the new information. This was also indicated with a strong mean of 4.67 but with a heterogeneous standard deviation of 0.53, indicating wide divergent views of the teachers.

The teachers were requested to indicate if they always present the mathematics content so as to interest and motivate individual learners. The majority 31(64.6%) agree and 15(31.3%) strongly agree that they always present the mathematics content so as to interest and motivate individual learners. This was also indicated with a strong mean of 4.277 but with a heterogeneous standard deviation of 0.53, indicating wide divergent views of the teachers.

### 4.1.5 Teachers Teaching Practices

The mathematics teachers were requested to indicate their teaching practices in teaching mathematics to the students. The results of the finding are as indicated in Table 4.4.

Ranking and Frequency (%)

	N	SD=1	D=1	N=3	A=4	SA=5	WM	Std Dev
I teach mathematics by representing and analyzing relationships using tables, charts, or graphs	48	0 0%	1 2.10%	1 2.10%	21 43.80%	25 52.10%	4.46	0.65
I write equations to represent relationships when teaching mathematics	48	0 0%	1 2.10%	12 25.00%	12 25.00%	23 47.90%	4.19	0.89
I prefer my students working individually without assistance from me when studying mathematics	46	9 18.80%	10 20.80%	8 16.70%	9 18.80%	10 20.80%	3.02	1.45

I prefer my students working in pairs or small groups with assistance from me when studying mathematics	48	2 4.20%	1 2.10%	5 10.40%	16 33.30%	24 50.00%	4.23	1.02
I prefer my students working together as a class with students responding to one another	47	4 8.30%	9 18.80%	10 20.80%	15 31.30%	9 18.80%	3.34	1.24
I refer my students to reading in a textbook or supplementary materials when studying mathematics	48	9 18.80%	6 12.50%	16 33.30%	9 18.80%	8 16.70%	3.02	1.33
I encourage my students to preparing oral reports either individually or as a small group when studying mathematics	48	7 14.60%	7 14.60%	8 16.70%	17 35.40%	9 18.80%	3.29	1.34
I use symbols to be able to calculate and demonstrate calculations	48	1 2.10%	1 2.10%	4 8.30%	20 41.70%	22 45.80%	1.04	
I always break any of the mathematical content to be taught into smaller components for easy understanding for the students	48	0 0%	0 0%	4 8.30%	8 16.70%	36 75.00%	0.63	

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**Key:** SD= Strongly Disagree, D=Disagree, N= Neutral, A= Agree, SA=Strongly Agree, P: Percentage, WM: Weighted Mean, Std Dev: Standard Deviation, (Std Dev<0.5-Respondents responses crowded around the mean), (Std Dev >0.5 – Respondents responses dispersed on the responses  
Source: Survey Data

The teachers were requested to indicate if they teach mathematics by representing and analyzing relationships using tables, charts, or graphs. The majority 21(43.8%) agree and 25(52.1%) strongly agree that they always teach mathematics by representing and analyzing relationships using tables, charts, or graphs. This was also indicated with a strong mean of 4.46 but with a heterogeneous standard deviation of 0.65, indicating wide divergent views of the teachers. When asked if they write equations to represent relationships when teaching mathematics, the majority 12(25.0%) agree



and 23(47.9%) strongly agree that they write equations to represent relationships when teaching mathematics. This was also indicated with a strong mean of 4.19 but with a heterogeneous standard deviation of 0.89, indicating wide divergent views of the teachers.

When asked if they prefer their students working individually without assistance from them when studying mathematics, the majority 9(18.8%) agree and 10(20.8%) strongly agree that they prefer students working individually without assistance from teachers when studying mathematics. This was also indicated with a strong mean of 3.02 but with a heterogeneous standard deviation of 1.45, indicating wide divergent views of the teachers. The teachers were requested to indicate if they prefer their students working in pairs or small groups with assistance from them when studying mathematics. The majority 16(33.3%) agree and 24(50.0%) strongly agree that they prefer my students working in pairs or small groups with assistance from teachers when studying mathematics. This was also indicated with a strong mean of 4.23 but with a heterogeneous standard deviation of 1.02, indicating wide divergent views of the teachers.

When asked if they prefer their students working together as a class with students responding to one another, the majority 15(31.3%) agree and 9(18.8%) strongly agree that they prefer their students working together as a class with students responding to one another. This was also indicated with a strong mean of 3.34 but with a heterogeneous standard deviation of 1.24, indicating wide divergent views of the teachers. The teachers were requested to indicate if they refer students to reading in textbook or supplementary materials when studying mathematics. The majority 9(18.8%) agree and 8(16.7%) strongly agree that they refer students to reading in a textbook or supplementary materials when studying mathematics. This was also indicated with a strong mean of 3.02 but with a heterogeneous standard deviation of 1.33, indicating wide divergent views of the teachers.

When asked if they encourage their students to prepare oral reports either individually or as a small group when studying mathematics, the majority 17(35.4.3%) agree and 9(18.8%) strongly agree that they encourage their students to preparing oral reports either individually or as a small group when studying mathematics. This was also indicated with a strong mean of 3.29 but with a heterogeneous standard deviation of 1.34, indicating wide divergent views of the teachers. The teachers were requested to indicate if they use symbols to be able to calculate and demonstrate calculations. The majority 22(45.8%) agree and 20(41.7%) strongly agree that they use symbols to be able to calculate and demonstrate calculations. This was also indicated with a strong mean of 4.40 but with a heterogeneous standard deviation of 1.04, indicating wide divergent views of the teachers. When asked if they always break any of the mathematical content to be taught into smaller components for easy understanding for the students, the majority 7(14.6%) agree and 36(74.0%) strongly agree that they always break any of the mathematical content to be taught into smaller components for easy understanding for the students. This was also indicated with a strong mean of 3.30 but with a heterogeneous standard deviation of 0.63, indicating wide divergent views of the teachers.

## 4.2 Multiple Regression analysis

The study applied the following model to illustrate the association:

$$\text{Year2012 Performance} = \alpha_0 + \beta_1 (\text{TP}) + \beta_2 (\text{TCS}) + \beta_2 (\text{TPR}) + \beta_3 (\text{TQ}) + \beta_3 (\text{TE}) + \varepsilon$$

$$\text{Year2013 Performance} = \alpha_0 + \beta_1 (\text{TP}) + \beta_2 (\text{TCS}) + \beta_2 (\text{TPR}) + \beta_3 (\text{TQ}) + \beta_3 (\text{TE}) + \varepsilon$$

$$\text{Year2014 Performance} = \alpha_0 + \beta_1 (\text{TP}) + \beta_2 (\text{TCS}) + \beta_2 (\text{TPR}) + \beta_3 (\text{TQ}) + \beta_3 (\text{TE}) + \varepsilon$$

### Regression Analysis for 2012

Table 4.5 Multiple Regression analysis on teacher quality and students' performance in mathematics in the year 2012

Coefficients analysis						ANOVA		Model Summary			
Model	Un standardized Coefficients		Standardized Coefficients	t Value	Sig.	F-value	P-sig	R	R Square	Adjusted R Square	ε
	B	Std. Error									
Constant	7.876	1.122		7.021	0.000	8.258	0.000	0.704	0.496	0.436	0.589
TEACHERS_PREPAREDNESS	-0.355	0.196	-0.217	-1.813	0.077						
COMMUNICATION_SKILLS	-0.351	0.172	-0.257	-2.043	0.047						
TEACHING_PRACTICE	-0.235	0.114	-0.237	-2.069	0.045						
Teachers Qualification	0.110	0.140	0.090	0.789	0.435						
Teachers Experience	-0.285	0.057	-0.587	-4.983	0.000						
Key: Predictors: (Constant), Teachers preparedness, communication skills, teaching practice, Teacher Qualifications, Teacher Experience. a. Dependent Variable: Year 2012 Performance in Mathematics											

Model summary from Table 4.6, indicates a very strong positive multiple correlation between teacher quality and students' performance in mathematics in the year 2012. In general the model showed a statistically significant ( $p$ -value (0.000)  $>$  0.05) relationship between the independent variable (teacher quality) and the dependent variable (students' performance in mathematics in the year 2012). The coefficient of correlation  $R$  was 0.704, indicating a strong positive multiple correlation between the independent variable and dependent variable. The coefficient of determination  $R^2$  was 0.496. The independent variables (teacher quality), significantly explained 49.6% of variance in the students' performance in mathematics in the year 2012. The remaining portion of the percentage can be explained by factors beyond the control of the study.

The  $t$  and  $\text{sig}$  ( $p$ ) values indicates a statistical significance of each independent variable in predicting the dependent variable. A large absolute  $t$  value and a small  $p$  value ( $p < .05$ ) points out that a predictor variable is significant in predicting the dependent variable. From the results of the analysis as indicated in Table 4.5, out of the five variables the three variables that had a significant factor in predicting students' performance in mathematics in the year 2012, those are

- Teachers experience in teaching mathematics ( $t = -4.983$  and  $p = 0.000$ ) whereby ( $p > 0.05$ )
- Communication Skills ( $t = -2.043$  and  $p = 0.047$ ) whereby ( $p > 0.05$ )
- Teaching Practice ( $t = -2.069$  and  $p = 0.045$ ) whereby ( $p > 0.05$ )

while the other two variable had no significant factor in predicting students’ performance in mathematics in the year 2012

d) Teachers Qualification( $t = -0.789$  and  $p=0.435$ ) whereby ( $p >0.05$ )

e) Teachers preparedness ( $t= -1.813$  and  $p=0.077$ ) whereby ( $p >0.05$ )

The following final regression models was developed

$$\text{Year2012 Performance} = 7.876 - 0.355 (\text{TP}) - 0.351 (\text{TCS}) - 0.235 (\text{TPR}) + 0.110 (\text{TQ}) - 0.285 (\text{TE}) + 0.589$$

### Regression Analysis for 2013

Table 4.6: Multiple Regression analysis on teacher quality and students’ performance in mathematics in the year 2013

Coefficients analysis						ANOVA		Model Summary			
Model	Un standardized Coefficients		Standardized Coefficients	t Value	Sig.	F-value	P-sig	R	R Square	Adjusted R Square	ε
	B	Std. Error									
Constant	8.007	1.142		7.021	0.000	8.337	0.000	0.706	0.498	0.438	0.605
TEACHERS_PREPAREDNESS	-0.335	0.200	-0.200	-1.813	0.100						
COMMUNICATION_SKILLS	-0.375	0.175	-0.269	-2.043	0.038						
TEACHING_PRACTICE	-0.230	0.116	-0.228	-2.069	0.053						
Teachers Qualification	0.096	0.142	0.077	0.789	0.503						
Teachers Experience	-0.299	0.058	-0.605	-4.983	0.000						
Key: Predictors: (Constant), Teachers preparedness, communication skills, teaching practice, Teachers Qualification, Teachers Experience a. Dependent Variable: Year 2013 Performance in Mathematics											

Model summary from Table 4.7, indicates a very strong positive multiple correlation between teacher quality and students’ performance in mathematics in the year 2013. In general the model showed a statistically significant ( $p\text{-value} (0.000) > 0.05$ ) relationship between the independent variable (teacher quality) and the dependent variable (students’ performance in mathematics in the year 2013). The coefficient of correlation  $R$  was 0.706 indicating a strong positive correlation between independent variable and dependent variable. The coefficient of determination  $R^2$  was 0,498. The independent variables (teacher quality), significantly explained 49.8% of variance in the

students' performance in mathematics in the year 2013. The remaining portion of the percentage can be explained by factors beyond the control of the study.

The t and sig (p) values indicates a statistical significance of each independent variable in predicting the dependent variable. A large absolute t value and a small p value ( $p < .05$ ) points out that a predictor variable is significant in predicting the dependent variable. From the results of the analysis as indicated in Table 4.6, out of the five variables the two variables had a significant factor in predicting students' performance in mathematics in the year 2013, those are

- a) Teachers experience in teaching mathematics ( $t = -5.146$  and  $p=0.000$ ) whereby ( $p >0.05$ )
- b) Communication Skills ( $t= -2.142$  and  $p=0.038$ ) whereby ( $p >0.05$ )

while the other three variable had no significant factor in predicting students' performance in mathematics in the year 2013

- c) Teachers Qualification( $t = -0.675$  and  $p=0.503$ ) whereby ( $p >0.05$ )
- d) Teachers preparedness ( $t= -1.681$  and  $p=0.100$ ) whereby ( $p >0.05$ )
- e) Teaching Practice ( $t= -1.993$  and  $p=0.053$ ) whereby ( $p >0.05$ )

From the findings on Table 4.7, the following final regression models was developed

Year2012 Performance =  $8.007 - 0.335$  (TP) –  $0.375$  (TCS) –  $0.230$  (TPR) +  $0.096$  (TQ) –  $0.299$  (TE) +  $0.605$

### Regression Analysis for 2014

Table 4.7 Multiple Regression analysis on teacher quality and students' performance in mathematics in the year 2014

Coefficients analysis						ANOVA		Model Summary			
Model	Un standardized Coefficients		Standardized Coefficients Beta Value	t Value	Sig.	F-value	P-sig	R	R Square	Adjusted R Square	ε
	B	Std. Error									
Constant	7.891	1.064		7.0416	0.000	8.483	0.000	0.709	0.502	0.443	0.561
TEACHERS_PREPAREDNESS	-0.361	0.186	-0.230	-1.940	0.059						
COMMUNICATION_SKILLS	-0.344	0.163	-0.264	-2.109	0.041						
TEACHING_PRACTICE	-0.212	0.108	-0.224	-1.969	0.056						
Teachers Qualification	0.105	0.132	0.090	0.792	0.433						
Teachers Experience	-0.272	0.054	-0.588	-5.023	0.000						

Key:

Predictors: (Constant), Teachers preparedness, communication skills, teaching practice, Teacher Qualifications, Teachers Experience

a. Dependent Variable: Year 2014 Performance in Mathematics

Model summary from Table 4.7, indicates a very strong positive multiple correlation between teacher quality and students' performance in mathematics in the year 2014. In general the model showed no statistically significant ( $p$ -value ( $0.000 > 0.05$ ) relationship between the independent variable (teacher quality) and the dependent variable (students' performance in mathematics in the year 2014). The coefficient of correlation  $R$  was 0.709 indicating a strong positive multiple correlation between the independent variable and dependent variable. The coefficient of determinant  $R^2$  was 0.502. The independent variables (teacher quality), significantly explained 50.2% of variance in the students' performance in mathematics in the year 2014. The remaining portion of the percentage can be explained by factors beyond the control of the study.

The  $t$  and  $\text{sig}$  ( $p$ ) values indicates a statistical significance of each independent variable in predicting the dependent variable. A large absolute  $t$  value and a small  $p$  value ( $p < .05$ ) points out that a predictor variable is significant in predicting the dependent variable. From the results of the analysis as indicated in Table 4.7, out of the five variables the two variables had a significant factor in predicting students' performance in mathematics in the year 2014, those are

- a) Teachers experience in teaching mathematics ( $t = -5.023$  and  $p=0.000$ ) whereby ( $p >0.05$ )
- b) Communication Skills ( $t= -2.142$  and  $p=0.041$ ) whereby ( $p >0.05$ )

while the other three variable had no significant factor in predicting students' performance in mathematics in the year 2014

- c) Teachers Qualification( $t = -0.792$  and  $p=0.433$ ) whereby ( $p >0.05$ )
- d) Teachers preparedness ( $t= -1.940$  and  $p=0.059$ ) whereby ( $p >0.05$ )
- e) Teaching Practice ( $t= -1.993$  and  $p=0.056$ ) whereby ( $p >0.05$ )

From the findings on Table 4.12, the following final regression models was developed

Year2014 Performance =7.891 - 0.361 (TP) – 0.344 (TCS) – 0.212 (TPR) + 0.105 (TQ) – 0.272 (TE) + 0.561

## Conclusion

The study concluded that there was a significant relationship between the independent variables (teacher quality) and the dependent variable (Students performance). From this study, it was noted that teachers with effective teaching practice register a higher student performance as opposed to teachers who resort to ineffective teaching practice. Additionally, teachers' with more teaching experience impact student performance than fresh graduates. Likewise, teachers' communication skills register a higher student performance. It was also found that well prepared mathematics teachers impacted positively to student performance.

## Recommendations

While assessing and evaluating students, mathematics teachers should be encouraged to make use of quizzes and tests to give pupils an opportunity to practice what they have learnt. Frequent

exercises, assignments, home works and projects would help to develop deep understanding of mathematics ideas and concepts. Teachers' commitment is vital in the teaching and learning of mathematics. All mathematics lessons have to be attended. Punctuality in mathematics should be enhanced, and workbooks are promptly marked and returned to motivate students' interest in the subject. Similarly, school heads are encouraged to carry out frequent teachers assessment and evaluations to enhance quality teaching and promote professional teaching habits. There is a need to offer sound training to mathematics teachers on the best teaching practices in mathematics. This will enhance their effectiveness and ability to handle diverse mathematics confidently. Equally, schools should facilitate provision of enough teaching materials in tandem with the curriculum. The recruitment policy need to be improved in such a way that more impetus should be given to teacher experience.

### Areas for Further research

Further research may focus on teacher personality factors like attitude and how it affects students' performance. Additionally, this research could be extended to cover the whole of Rwanda.

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Title: EFFECT OF TEACHER QUALITY ON STUDENT PERFORMANCE IN MATHEMATICS IN PRIMARY 6 NATIONAL EXAMINATION: A SURVEY OF PRIVATE PRIMARY SCHOOLS IN GASABO DISTRICT, KIGALI CITY, RWANDA Author: Leah Muthoni Gichuru, Pro. Raymond Wafula Ongus(PhD). Title: To what extent are Girls' Boarding Primary Schools in North- Horr sub county, Marsabit County of Kenya, Girl-friendly? Author: Jillo Sharamo Kalla. Title: the impact of strategies executed to address understaffing of teachers in public secondary schools in buuri district: meru county: kenya. Author: 1. Dr.KIBAARA, TARSILLA, M. (Ph.D), 2. MBAABU SIL Effect of teacher quality on student performance in mathematics in primary 6 national examination: A survey of private primary schools in Gasabo District, Kigali City, Rwanda. International Journal of Education and Research, 4(2), 237. Murnana, O. P., Kile, D. E. (1978). The art of teaching, Chicago: University of Chicago Press. Nyanzi, R. (2017).The effects of Teacher's and teaching experience in Ordinary level Secondary School students' performance in Science subjects in Masaka District, Uganda. Kampala: Unpublished M.A dissertation. Makerere University. Okello, M. (2013). The influence of t... Children who attend primary school in countries with low per capita incomes have learned substantially less after similar amounts of time in school than have pupils in high income countries. At the same time, the lower the income of the country, the weaker the influence of pupils' social status on achievement. Conversely, in low-income countries, the effect of school and teacher quality on academic achievement in primary school is comparatively greater. From these data, which are more representative of the world's population of schoolchildren than those used in previous studies, it i