

Assessment of School Factors Related to Academic Achievement in Mathematics among Secondary School Students of Masaba South Sub County, Kenya

Peter Omae Onderi¹ Michael Okello Okwara² Pam Raburu² Samson Barongo³ Evans Mokaya³
Henry Mokogi³ David Omae⁴
Maseno University, Jaramogi Oginga University of Science and Technology, Kisii University, Nyangusu
Secondary School., Kenya

Abstract

Performance in mathematics in Masaba Sub-County, Kenya has been poor for many years. In 2010 the mean score was 3.2282, while in 2011 it had a mean score of 3.9528 and in 2012 it had a mean of 4.0660 which is far below the maximum mean of 12.00. The purpose of this study was to assess factors related to academic achievement in mathematics in Masaba South Sub County. The research objective of the study was to; establish the relationship between school factors and academic achievement in mathematics. Students of Masaba South Sub County miss out in joining lucrative careers because of persistent poor performance in mathematics. Masaba was chosen because no similar study has been done there and performance in mathematics has been poor compared to other sub counties. The research employed correlation design in which the dependent variable was academic achievement in mathematics and the independent variables were school factors. A conceptual framework was used to show the interaction between the dependent variables and independent variables. The population used was 40 schools in Masaba South Sub County, 4000 students and 40 Principals. Saturated and stratified sampling techniques was used to select 6 school Principals, 6 mathematics teachers and 400 students in secondary schools in Masaba South Sub County, Kenya. Student questionnaire, mathematics test, document analysis guide, and interview schedules for head teachers were used to collect data. Qualitative data was analyzed using Thematic Analysis by coding and identifying themes per response. Cross tabulation of responses and calculation of percentages was done for quantitative data using statistical packages for social sciences version 20.0. Reliability of the instruments was established through piloting of the instruments. Validity of instruments was established through discussion with experts from Jaramogi Oginga Odinga University of Science and Technology school of education. The study might be useful to the ministry of education in improving the education system. The study found that poor performance in mathematics was due to, lack of mathematics policy in Masaba south sub county schools. Based on the results a model was developed to guide appropriate relationships between the variables that influence performance in mathematics. The researcher recommended that schools should set up mathematics policies in their schools and guide students on mathematics issues.

Keywords: Academic achievement, school factors.

INTRODUCTION:

Mathematics is part and parcel of our daily life; as such the provision of quality education and subsequent high performance is inevitable for the realization of millennium development goals and the vision 2030 (Ndemba, 2014). Shin, Jongho, Hyunjoon & Yongnam, (2012) carried a study on student and school factors affecting mathematics achievement, international comparisons between Korea, Japan and the USA. The purpose of the study was to comparatively investigate student- and school level factors affecting mathematics achievement of Korean, Japanese and American students. The results of the study showed that different patterns of the relations between student- and school- level predictors and mathematics achievement were present among the three countries. Adebola, & Ademiola (2011), investigated nine school quality factors that are likely to influence student's achievement in mathematics in south-western and north-central Nigeria. The study adopted a descriptive survey research design of the ex post facto type and made use of a sample of 1014 mathematics teachers and principals selected through a multi-stage sampling procedure. Data collected were analyzed using means, standard deviation and multiple regressions. Out of the 9 variables, the two variables that contributed significantly to students achievement in mathematics were conveniences and instructional materials ($b=0.130$, $t=2.381$, $p=0.05$), ($b=0.134$, $t=2.470$, $p=0.05$) respectively. Oisebe (2011) investigated the effect of teacher preparations when teaching the topic vectors to form three secondary schools students in Masaba south sub county. The Solomon- four experimental designs was adopted. The researcher found a positive correlation. Poor performance in mathematics has been a major problem of concern to secondary education in Kenya in the last five decades. Masaba south Sub County was chosen for the study by the researcher because of poor performance in the subject in KCSE examinations. The purpose of the study was to find out the factors related to academic achievement in mathematics. The specific objective of the study was to establish the relationship

between school factors and academic achievement in mathematics. The Hypothesis was .H01: There is no statistically significant relationship between school factors and academic achievement in mathematics. The expected findings of this study might assist educational stakeholders such as the ministry of education, Kenya Institute of Education, school administrators and parents to consider factors that influence performance in mathematics with a view to improving academic achievement in mathematics. The study examined the relationship between the selected school factors and academic achievement in mathematics. The geographical scope was Masaba south sub county .The study was based on the following assumptions; that all public secondary schools offer the same mathematics curriculum. The study was limited due to lack of adequate financial resources.

METHODOLOGY.

The researcher adopted correlation design. The study was carried out in secondary schools in Masaba south Sub County, Kisii County, Kenya. The population of the study was 4000 form four students, 40 math teachers and 40 principals of Masaba south sub county. The study used saturated sampling technique to select 35 principals as the rest remaining 5 were used to pilot the instruments and according to Kathuri and Pals (2010), .The population of form fours in the remaining 35 schools (5 schools were used for piloting) will be 3500 out of which 400 forms 4s will be used in the study. The Instruments that were used to collect data were the questionnaires, interview schedules, mathematics test and document analysis guides.A questionnaire was prepared to find out the influence of school factors and math achievement. A joint mock examination was used to measure academic achievement in mathematics. Form 4 student personal files. The researcher did document analysis using form four student personal files. Another document analysis guide used was the 2013 KCSE results print out (government printer).. An interview schedule was carried out to determine the principal’s view on the influence of selected factors and math achievement at secondary education. Before the questionnaire was used to collect data, a pilot study (Mugenda and Mugenda, 2013) was conducted in five schools. Validity of the instruments was ascertained by the assistance of experts from the department of educational psychology, Jaramogi Oginga Odinga University of science and technology. Reliability was ascertained through pilot study (Mugenda, 2008). The pilot study was conducted in five (12.5%) schools and Pearson product moment correlation coefficient was used to determine the reliability of the questionnaires at the set alpha level of significance of 0.05. Student’s questionnaire had a Pearson of r coefficient of 0.75. This study used frequencies, means and percentages generated from SPSS version 20.0, because they easily communicate the research findings to majority of the readers (Gay, 2012.The researcher used a thematic analysis to pinpoint, examine and record patterns (or “themes”) within data. The researcher assured the target respondents that their confidentiality was to be upheld at all stages of the study by keeping their identities anonymous while the data collection tools were being administered.

RESULTS AND DISCUSSIONS:

The study sought to establish the rrelationship between school factors and academic achievement in mathematics in Masaba South Sub-county. The researcher computed percentage frequencies of the responses from the students and tabulated as shown in Table 4.1

Table 4.1: Percentage Response Frequency for School Factors

Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Textbooks are Available for my use	50.92	31.13	4.49	6.33	7.12
Leadership is good in my school	42.05	32.08	6.47	11.59	7.82
Our Teachers are well prepared	47.51	29.28	7.18	8.29	7.73
There are adequate Facilities for learning mathematics in my school	37.02	24.03	7.73	15.75	15.47
Am Motivated to learn mathematics	57.62	19.11	5.54	8.31	9.42

The table 4.9 above shows the percentage response on response frequency for school factors. Research findings show that most of the schools in Masaba South sub-county do not have adequate supportive teaching and learning resources. Although 37.02% of the students who participated in the study accepted that there were adequate facilities for learning mathematics in their schools, nearly a third (31.22%) of the students refuted the intuition that they have adequate mathematics learning amenities. Nonetheless, half (50.92%) of the respondents strongly agree that at least textbooks were available for their use, only small proportion (13.45%) of the students held the view that relevant mathematics textbooks were not adequately available in their schools. The findings of this study agree with studies conducted with educational Insight (2005) in Kenya which revealed that inadequate learning facilities are a common feature in many secondary schools. It also agrees with Chikasa (2014) which found that school based factors affect mathematics performance.

The study established a small but positive ($r = .317$) correlation between school factors and academic

achievement on mathematics as shown on table 4.2

This agrees with Nyangau (2012) study which found a strong correlation between teaching learning facilities and mathematics performance. In Masaba South Sub county some schools are poorly equipped and this affects performance.

Table 4.2. Correlations on school factors

		School Factors	Marks Obtained in KIMA Mock Exams
School Factors	Pearson Correlation	1	.317*
	Sig. (2-tailed)		.048
	N	342	342
Marks Obtained in KIMA Mock Exams	Pearson Correlation	.317*	1
	Sig. (2-tailed)	.048	
	N	342	342

Correlation is significant at the 0.05 level (2-tailed).

The correlation was significant at $p = .048$, as shown in the SPSS output in Masaba South sub-county. This agrees with Okurut (2012) which found that a school policy can improve learning.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS:

The study was on relationship between school factors and academic achievement. The first hypothesis was to test the relationship between school factors and academic in mathematics. The findings were that; School factors like teaching learning facilities influence achievement in mathematics. The study established a small but positive relation ($r=0.317$) correlation between school variables and academic achievement in mathematics. This means there was a significant relationship between school factors and academic achievement on mathematics in Masaba South sub county. 49.25% of the students did not like the methods of teaching used by their mathematics teachers. Teachers in Masaba South sub county use chalk and talk method with little individual attention. This causes poor math performance in Masaba South sub county. Most mathematics teachers in Masaba South sub county are male (87.5%) compared to females (12.5%). This means that the girl child has no role mode and this contributes to their poor performance. 37.02% accepted here were adequate facilities of learning mathematics in the school, 74.13% agreed that they were satisfied with the administration of their schools. 57.62% agreed that they were motivated. Stable leadership is good for performance. The conclusions were presented along the hypotheses that guided the study.

School factors and academic achievement in mathematics.

- School factors affect performance in mathematics like school policy on class promotions. When a school has put some marks to be scored by a student before going to next class performance is likely to be high and vice versa.
- availability of adequate teaching learning facilities will contribute highly to the academic achievement in mathematics.
- highly qualified and motivated teachers will contribute a lot to the good performance in mathematics.
- Previous school performance also contributes much to the current performance since it gives students morale to do even better.

Recommendations

Based on the findings and conclusions of the study, recommendation is hereby made for the stakeholders: Every school should come up with a mathematics policy in order to do well in mathematics

REFERENCES

- Adebola O.I & Ademola I.A (2011). School quality variables and secondary school student's achievement in mathematics in south western and north central Nigeria. *The African symposium. An online journal of the African educational research network.*
- Chirume, S & A.S Chikasa (2014). A critical analysis of the factors affecting achievement in secondary school mathematics in Zimbabwe. A case of Gweru district. *Merit research journal of education and review.* (ISSN: 2350-2282). Vol.2 (9) pp.194-202, September, 2014. Available online <http://www.meritresearchjournals.org/er/index.htm>.
- Gay, L.R. (2012). Educational research; components for analysis and application. 4th edition, New york: Macmillan publishing company.
- G.O.K. (2001). *Report of Task Force on Student Discipline and Unrest in Secondary Nairobi*: Government Printers.

- Kathuri, N.J., & Pals, D.A (2013).introduction to educational research. Njoro: *Egerton university educational media Centre*.
- KCSE (2014). Results analysis. Unpublished. Government printer
- Kenya National Examinations Council (2014).Examination report. Nairobi: Kenya national examinations council
- KNEC (2014).Examination Analysis. Unpublished
- (2012).Examination Analysis. Unpublished
- MUGENDA, O. M & Mugenda, A.G. (2013). *Research methods and quantitative and qualitative approaches*. Nairobi, ACTS.
- Nyangau, M.O. (2014). An investigation into the causes of poor performance in mathematics by secondary school pupils in Nyaribari Masaba division of Kisii district. Unpublished thesis of Kenyatta University.
- Oisebe, M.V (2012). *Barriers to the teaching-learning of mathematics in secondary schools in Masaba South district, Kisii County, Kenya*. Unpublished research Project of Kenyatta University
- Okurut, C., Ssebbunga, C. M., Ngobi, D. H., Maani, J. S., & Gumisiriza, E. L.(2012). Mathematics achievement in primary schools in Uganda. *journal of education and practice*. Vol 7 pp35-65
- Shin, J, Jongho, S Hyunjoom, L & Yongnam, K (2012). Student and school factors affecting mathematics achievement, international comparisons between Korea, Japan and the USA. *School psychology international*. Sage journals
- Usasia, D. (2011). Mathematics achievement in western Kenya. *Journal of contemporary ideas*. Vol 3 pp23-45

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:

<http://www.iiste.org>

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Academic conference: <http://www.iiste.org/conference/upcoming-conferences-call-for-paper/>

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

