# Influence of home learning environment on Students' Performance in Mathematics in Public Secondary Schools in Migori County, Kenya

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*Abstract:* **Performance in Mathematics has been poor at secondary level in Kenya despite initiatives like Strengthening Mathematics and Science Studies Education (SMASSE), providing text books and employing trained mathematics teachers by the Government. In view of the aforementioned problem; the purpose of the study was to investigate the influence of home based factors on students' performance in Mathematics in selected public secondary schools in Migori County. The objective of the study was to determine the influence of home learning environment on students' performance in Mathematics in Public Secondary Schools. The study was guided by Ajzens theory of planned behavior. The study adopted mixed methods approach and its research design was descriptive survey. The targeted populations were; 185 schools and 17000 form IV students and 400 Mathematics teachers. Using simple random sampling, purposive sampling techniques and Glen's Israel formula of getting the sample size was used to get a sample size of 56 schools and 800 students 150 Mathematics teachers. Data was collected using a questionnaire and an interview schedule for selected students and Mathematics teachers. Data was analyzed by descriptive statistics of mean, frequency, standard deviation, correlation coefficient and inferential statistics (ANOVA). SPSS Program version 23 was used in the analysis of data. The study has revealed that, home learning environment significantly predicts performance among secondary school students, $F_{(1, 690)}$ 410.442, $p < .05$.**

*Keywords:* **mathematics teachers, Public Secondary Schools, learning environment.**

## 1. BACKGROUND TO THE STUDY

Mathematics is a compulsory subject in Kenyan secondary school curriculum. The importance of school Mathematics cannot be overemphasized. Mathematics is crucial for increased student's achievement in school, for producing informed citizens, success in careers, as well as in personal fulfillment. In today's technology driven society, greater demands have been placed on individuals to interpret and use Mathematics to make sense of information in complex situations. Mathematics is an essential tool in many fields, including natural science, engineering, medicine, and the social sciences. It is also used in day-to-day activities at home, in the market places and in offices (Mondoh, 2005). Eze (2009) found that, the prosperity of any nation depends largely on the volume and quality of mathematics offered in its school system. Researchers have undertaken studies on factors that influence poor performance of mathematics in secondary schools, but they have not addressed home based factors. They have looked at: teachers' factor for example was researched on by

Musasia, Nakhanu and Wekesa (2012) on syllabus coverage, Hanushek and Rivkin (2012) researched on the distribution of qualified teachers in institutions and lastly Tella (2007) study on how a teacher motivates a class to influence good performance. Learners' factor was researched on by Manoah, Indoshi and Othuon (2011) who researched on the attitude of a learner towards Mathematics, while Ojaleye (2000) looked at students' ability to learn Mathematics. School factor was researched on by Eraikhuemen (2003) who looked at school factors that influence good achievement in Mathematics and Markman (2008) who researched on why girls drop out of school. In the current study the researcher investigated on Home-based factors that influence students' performance in Mathematics in public secondary schools in Migori County.

A home is a place where one lives, especially as a member of a family or household. It is a place of residence (Gitau, 2014; Akeri, 2015). A home is not a mere transient shelter. Its essence lies in the Personalities of the people who live in it. Home Environment refers to the surroundings where one lives (Anene, 2005). Environment is the aggregate of all internal and external conditions affecting the existence, growth and welfare of an individual. It is an influence that an individual comes in contact with after one is born. Anene (2005) explained that environment can be divided into physical, social and abstract environments.

Physical environment is composed of the objects or materials found in the home, school or community. It also includes the people such as parents, siblings and peers (Anene, 2005). Anene also explained that the social environment includes all means that bring people together and share ideas for example societal meetings, worship, the social life, societal organizations and clubs that affect an individual. Abstract environment is made up of the reactions, feedback and the responses received on interactions with others. The focus of this study is on the home based factors influencing academic performance of a student in mathematics. This therefore, entails the objects, materials, parents, siblings, peers and social life that exists in the home in which the student find himself/herself. All these variables in the home which affect a person's existence, behavior and performance constitute the home environmental factors. Academic Performance on the other hand is the outcome of education as it is the extent to which students or an institution has achieved the educational goals.

Home based factors are conditions inherent to the home environment that either limit or influence academic performance of students. Academic achievement is commonly measured by examination or continuous assessment results (**Akeri, 2015**). However, there is a general agreement on how it is best tested (Bossaert, Doumen, Bugse &Verschueren, 2011).The study investigated home based factors influencing students' performance in mathematics in public secondary schools in Migori County, Kenya.

**Importance of Mathematics**

Mathematics is rigorous and demands intellectual pursuit that requires continued practice for mastery of the concepts. It is also interesting, exciting and challenging to students who practice it and persistently do it.  Students like its clarity and the certification of knowing when they have the right answer to a problem**.** Mathematics takes a significant position in human civilization and it is the mother of all professions because numeracy is applied across the disciplines. It is a medium of social and economic functions in our everyday lives (Mondoh, 2005).The social functions include: buying, selling and banking, just to name a few of them. Mathematics helps to develop powers of thinking, accuracy and spatial awareness (KIE, 2002). For Kenya to achieve her dream of Millennium development goal that is summarized as Vision2030; that aims at making Kenya a newly industrialized middle income country (GOK, 2007), then the greatest population of the students should excel in sciences and the vehicle for this is Mathematics.

Mathematics has been recognized as an important area of learning aimed at driving economies and technological transformation of any society. Therefore, the promotion of the subject is important for the development of human kind. Mathematics is an embodiment of knowledge, skills and procedures that can be used in a variety of ways. It can be used to describe, illustrate, interpret, predict, explain patterns and relationships in numbers in order to convey and clarify meanings of various issues in life (National Council for Curriculum and Assessments, 2005).

Mathematics teaching is very important as well as other subjects for intellectual development, it is one of the subjects in the curriculum which makes students to develop critical thinking and become active in problem solving which helps in the development of mental faculties. Mental work is needed to solve mathematical problems. If a child has a mathematical problem her/his brain becomes active in solving that problem. Each problem of mathematics possesses such sequence

which is necessary for constructive and creative processes. In this way, all-mental abilities of a child can be developed through mathematics.

Moreover, mathematics enables a learner or a person active in calculating exact measures that are required in an activity so that she/he can save time and money. A student develops a strong will power in mathematics to be patience and self-reliance to do mathematics at home and everywhere when need arises. It also develops the power of discovery and invention, because as one computes problems, some other methods are discovered that yield the same answer (National Council for Curriculum and Assessments, 2005).

The main aim of education is to help a learner to earn a living and to make them independent. To achieve this aim, mathematics is an important subject because an individual learner may make a living out of it by being creative and innovative leading to creation of industries which may generate income to the society.

The subject helps to prepare students for technical and other vocational courses where mathematics concepts are applied, for example, engineering, architecture, accountancy, banking, business and agriculture. In addition to the above, mathematics is also required in tailoring, carpentry, surveying, and office work above all.

**Concern over performance in mathematics**

Learners' performance in mathematics at secondary school in Kenya has continued to be poor over the years (KNEC, 2007), that is why the researcher looked at home based factors that could be influencing the poor results in mathematics.

Ojaleye (2000) says that Mathematics is a cornerstone for development of any contemporary society hence there is concern for the continued poor performance by students. He claims that mathematics enables participation of a person in lifelong activities. In modern technology – driven times, countries rely on highly skilled populations and Living fulfilling and productive life may also be increasingly challenging for individuals without minimal level of skills in numeracy. A certain level of knowledge of mathematics, science and technology is essential for participation in all aspects of modern society (Eraikhuemen,2003). Without mathematics, the understanding of some problems may be superficial and their solutions impossible according to (Osafehinti 1999)

## 2. LITERATURE REVIEW

Rockwell (2011) observed that children from low-income families are disadvantaged in many areas, especially in academia. Low-income families often do not have the resources to save for their children's college education and lack information about financial aid options other than scholarships. Parents who expect their children to attend college encourage them to maintain good grades in order to obtain scholarships. In most cases, however, scholarships are not enough.

A study conducted by Drummond and Stipek (2004) examined the educational support of low income parents for their children. Of the 234 low-income families that were interviewed, the majority said that the best way to help their children succeed academically was to provide for them, offer support, and teach them social skills. Parents were more focused on providing for their children's basic needs than helping them with homework or being involved in their children's school (Rockwell, 2011). Parents with low SES who want to be involved in their children's schooling face disadvantages such as inflexible work hours that prevent them from being available (Rockwell, 2011). This is very different from high SES parents. Parents who have a college education tend to encourage their children to attend college by talking about their own college experience (Rockwell, 2011). High-income parents are more likely to have frequent discussions with their children about college and take them on college visits. They also have the funds to start saving money for their children's college education as well (Rockwell, 2011).

Asikhia (2010) noted that family educational background and socio-economic status influence the academic performance of students; that these two are lumped together because they are related. The current study seeks to examine the characteristics of parents in improving the students' academic performance in public secondary schools in Migori County.

If a child's parents are reading books, attending ongoing education classes and taking him along to the museum and they are engaging him in a number of direct-learning experiences that will help him value achievement and success (Eccles, 2005). One mother mentioned her taking night courses of mathematics to be more helpful for his son; and her studying

with him is a good example for this issue. Also her efforts seemed to make him give more value to studying maths. Again according to Eccles(2005), parents with higher education levels have stronger confidence in their child's academic abilities, and they also have higher expectations of their child. They expect that their child will earn good grades, behave well in school and attend college. These high expectations motivate their child to do well. The confidence they have in their child builds his own confidence in his academic abilities and makes him more likely to succeed.

The study of Tsui (2005) indicated that the education level of a parent is a significant predictor of a child's educational achievements and behavioral outcomes. Parents, who are educated raise children to have healthy self-perceptions when it comes to their academic abilities, engage them in intellectual activities that help them develop a healthy attitude about learning.

According to Filho (2008), parents' positive attitude towards child's education is important in determining school attendance and academic achievement of the child. Parent's attitude towards their children's education is affected adversely by low socio-economic status and since the tribal constitute the disadvantaged population, it is expected that the attitude of parents of tribal children will be unfavorable towards education.

Ho and Willms (2007) carried out a study on the effects of parental involvement on eighth grade achievement and identified four dimensions of parental involvement; he assessed the relationship of each dimension with parental background and academic achievement for a large representative sample of U.S. middle school students. The findings provided little support for the conjecture that parents with low socio-economic status are less involved in their children's schooling than are parents with higher socioeconomic status. The study however used primary data from students, principals and PTA members collected by questionnaires and interview methods, while the current study was conducted among secondary students.

The US center for marriage and family released a study that shows broken family structures consistently lead to education difficulties for children, (Schultz, 2006). The report found that children from non- intact families have significantly high rates of difficulty with all children levels of education. Research indicates that children exposed to domestic violence are at an increased risk of being neglected. One of the impacts is that such children develop cognitive and attitudinal problems which affect the academic performance (Child Welfare Information Gateway 2009).

A study conducted by Chimombo (2005) in Malawi on basic education in developing countries revealed that the necessity in children to engage in tasks that support household survival limits their academic performance. This is especially common in the rural and urban squatter groups. In Kenya children from poor family settings combine schooling and other activities such as household chores, farm work, work outside homes and family business (Moyi, 2011). He points out that most of the children who work and attend school are likely not to do well. The findings of the study were that most parents are poor and unemployed and hence cannot meet other required school levies. It also found out that most of the parents have no formal education and thus can't neither assist their children at home nor motivate them to work hard since they are ignorant of education. The researcher recommended that the MOE should give maximum protection to the children by enforcing the law on the child rights to protect them from child labor and other home based mistreatments that affect their performance. Based on the findings, the head teachers should sensitize the parents and the community on the benefits of education and the needs of educating their children. The school management committees should also create favorable learning environment in school for the pupils to maximize learning to compensate for the time lost due to home based factors. The suggestions for the study include need to conduct such study in other sub-counties and also to carry a similar study in private schools so as to scrutinize their performance. Finally a similar study should be conducted incorporating parents and SMC members since they are key stakeholders in education sector.

Akeri, (2015) conducted a study in southern Gucha Sub County, Kenya. The objective of the study was to find out the effects of resource provision on pupils performance in KCPE in Kenya. That is, if the quality of education is undermined when the family does not provide for the needs of a learner at school. That implies the school alone may not offer children adequate knowledge, skills and altitude that a country requires in its citizens to guarantee the role of education in development (World Bank 2001). The current study on other hand was conducted in public secondary schools in Migori County.

## 3.   RESEARCH METHODOLOGY

The study area is Migori County, a county in the former Nyanza province. It lies between $0^0.20^1$S and $50^1$S of the Equator, latitudinal extent. Longitudinal extent, Migori County lies between $34^0$E and $35^0$EIt is in the south- western part of Kenya. Migori County is located in western Kenya and borders Homa Bay to the north, Kisii to the north east, Narok to the east and south east, Tanzania to the south and south West and Lake Victoria to the west. The capital is Migori town, which is also the largest town in the county. The county has a population of 917,170 (County report 2018).

The researcher chose to conduct this research in Migori County because performance in mathematics in national examination is poor at secondary level in this county. The table below shows Lake Region Counties; Kenya Certificate of Secondary Examination result from 2016 to 2018

| YEAR | 2016 | 2017 | 2018 |
|------|------|------|------|
| MIGORY COUNTY | 2.5141 | 2.4432 | 2.605 |
| KISUMU COUNTY | 3.831 | 2.753 | 3.591 |
| SIAYA COUNTY | - | 3.43 | 3.964 |
| HOMABAY COUNTY | 3.3624 | 3.597 | 3.7381 |
| NATIONALITY | | | |

**Figure 3:1 Lake Region Counties mean scores in mathematics at KCSE level**

**Source:** Ministry of Education Quality assurance and Standards department.

From the table above performance of mathematics in Migori County has stagnated at a mean of two point five from 2016 to 2018 while the other sister counties mean is approaching four. These differences in performance from the other counties have prompted the researcher to find out the cause of such poor performance.

A survey design was used for the study and adopted mixed method approach for data collection from the target population by getting opinions through questionnaires for the students who were selected. A survey research design was used to find answers to questions through the analysis of variables relationship. A descriptive research design was used to evaluate the influence of attitude on studying mathematics at home and the influence it has on mathematics achievement in public secondary schools in Migori County.

The target populations are one hundred and eighty five (185) public secondary schools and 17000 form four candidates. Approximately 17,000 Form fours are the targeted population because, they have a more experience in secondary school than any other class and therefore feel the influence of home based factors on studying mathematics at home. Therefore these form fours will communicate a reality than any other forms. Migori County has a total of one hundred and eighty five public secondary schools with a population candidature of seventeen thousand (17,000). This population comprises of nine thousand six hundred forty six (9,646) boys and seven thousand five hundred and eighty (7,580) girls.

## 4.   RESULT AND DISCUSSION

**Influence of home Learning Environment on Students' Performance.**

The objective of the study was to determine the influence of home learning environment on students' performance in mathematics in public secondary schools. This objective was addressed by exploring the level of home learning environment among the students' in public secondary schools and establishing whether it has statistically significant influence on performance in mathematics

**The Level of Home Learning Environment among Secondary School Students**

The suitability of home learning environment among the students' in public secondary schools was investigated through the use a questionnaire to rate the indicators of home learning environment. The rating was on a five point Likert rating scale ranging from strongly disagree (1) to strongly agree (5). The views of the student respondents were summarized into frequencies, percentages, means and standard deviation, as shown in Table 4.1.

**Table 4.1: Suitability of Home Learning Environment**

| | SD | D | U | A | SA | Mean | StD |
|---|---|---|---|---|---|---|---|
| **There are no Maths textbooks at home** | 148 (21.4%) | 189 (27.3%) | 23 (3.3%) | 165 (23.8%) | 167 (24.1%) | 3.02 | 1.53 |
| **Studying environment at home is not suitable** | 170 (24.6%) | 221 (31.9%) | 37 (5.3%) | 142 (20.5%) | 122 (17.6%) | 2.75 | 1.47 |
| **There are no lights at home to enable me to study Mathematics** | 303 (43.8%) | 224 (32.4%) | 16 (2.3%) | 73 (10.5%) | 76 (11.0%) | 2.13 | 1.36 |
| **I have all requirements(set, calculator and mathematical table) at home** | 111 (16.0%) | 164 (23.7%) | 24 (3.5%) | 202 (29.2%) | 191 (27.6%) | 3.29 | 1.48 |
| **At home there is a study room** | 149 (21.5%) | 185 (26.7%) | 16 (2.3%) | 211 (30.5%) | 131 (18.9%) | 2.99 | 1.48 |
| **My parents supervise my mathematics studies at home.** | 176 (25.4%) | 179 (25.9%) | 49 (7.1%) | 172 (24.9%) | 116 (16.8%) | 2.82 | 1.47 |
| **When am at home my parents ensure that I study Mathematics** | 138 (19.9%) | 224 (32.4%) | 43 (6.2%) | 187 (27.0%) | 100 (14.5%) | 2.84 | 1.39 |
| **When I am at home I have freedom to do anything** | 189 (27.3%) | 217 (31.4%) | 38 (5.5%) | 118 (17.1%) | 130 (18.8%) | 2.69 | 1.49 |
| **My parent has no time to supervise my mathematics preps at home** | 167 (24.1%) | 221 (31.9%) | 43 (6.2%) | 163 (23.6%) | 98 (14.2%) | 2.72 | 1.42 |
| **my parents educational level enables him/her to help me do** | 159 (23.0%) | 208 (30.1%) | 42 (6.1%) | 163 (23.6%) | 120 (17.3%) | 2.82 | 1.46 |
| **my parents educational level enables him/her to help me do Maths assignment at home** | 290 (41.9%) | 212 (30.6%) | 39 (5.6%) | 104 (15.0%) | 47 (6.8%) | 2.14 | 1.29 |
| **my parents /guardians checks on my Maths exercise books to see on my progress** | 166 (24.0%) | 200 (28.9%) | 24 (3.5%) | 214 (30.9%) | 88 (12.7%) | 2.79 | 1.42 |
| **my parents has no knowledge on preps at home** | 264 (38.2%) | 249 (36.0%) | 44 (6.4%) | 89 (12.9%) | 46 (6.6%) | 2.14 | 1.24 |
| **Mean level of suitability of home learning environment** | | | | | | 2.70 | 0.48 |

Key: SD-Strongly Disagree; D-Disagree; U-Undecided; A-Agree; SA-Strongly Agree and StD-Standard Deviation.

Source: Survey Data (2018)

On home learning environment, the results of the study show that its suitability in Migori County was rated as moderate or average. Using the scale of 1 to 5, it was rated at 2.70 (SD=0.48). This implies that most of the students do not have appropriate physical, social and abstract home learning environment. For example, in the physical learning environment it was established that there are no mathematics textbooks in many 47.9% of the home. Equally, more than a fifth 149 (21.5%) of the students who participated in the study confirmed that there are no lights at their homes to enable them to study mathematics, reflecting a mean of 2.13 (SD=1.36) in the suitability of home learning environment. Worse, it emerged from the study findings that many 334 (48.2%) of the students have to make do without a study room at their homes.

Likewise, it emerged that many of the students lack appropriate mathematical equipment. This was revealed by 275 (39.5%) of the students who took part in the study who said they do not have all requirements (set, calculator and mathematical table) to study mathematics at home.

The findings of the study indicate that although some parents are closely involved in their children learning of mathematics, others are not involved at all. Whereas only 116 (16.8%) of the students said their parents always supervise their mathematics studies at home, more than a half 355 (51.3%) of them said their parents hardly supervise them in mathematics. Only 100 (14.5%) of the students asserted that when they areat home their parents ensure that they study mathematics, but majority 362 (52.3%) of them are never followed up by their parents to study mathematics, reflecting home learning environment suitability of only 2.84 (SD=1.39).

On abstract environment, the study established that studying environment at home is not abstractly suitable to many 391 (56.5%) of the students. For examples, many parents have no time to supervise their children on mathematics preps at home. However, some parents cannot supervise their children due to the fact that the parents lack adequate educational level to enable them to help their children 367 (53.1%) do mathematics assignment at home. Only a small proportion 151 (21.8%) of the students had their parents having appropriate educational level to enable them help in mathematics assignment.

**Influence of home Learning Environment on Students' Performance in Mathematics**

$H_0$: There is no statistically significant influence of home learning environment on students' performance in mathematics in public secondary schools.

To investigate the influence of home learning environment on performance in mathematics among public secondary school students, the null hypothesis was tested. A simple linear regression analysis was conducted to estimate the level of influence, with scores on perceived home learning environment as the independent variable and student performance in mathematics as the dependent variable. The independent variable was computed from frequency of responses and converted into continuous scale, where high scale ratings implied more suitable home $_{learning}$ environment among the students and vice-versa. The significant level (p-value) was set at .05 such that if the p-value was less than 0.05, the null hypothesis would be rejected and conclusion reached that a significant difference does exist. If the p-value was larger than 0.05, it would be concluded that a significant difference does not exists. Table 4.2 shows the regression analysis results in SPSS output.

**Table 4.2: Regression Results - Influence of Perceived Home Learning Environment on Students' Performance in Mathematics**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-----|----------|-------------------|----------------------------|
| 1 | .611[a] | .373 | .372 | .55334 |

Predictors: (Constant), Home Learning Environment

Dependent Variable: Students' Performance in Mathematics

It is evident from Table 4.2 that there is a positive correlation (R=.611) between perceived home learning environment and performance in mathematics among public secondary school students, with high perceived home learning environment associated to better performance in mathematics and vice-versa. The results further reveals that perceived home learning environment accounted for about 37% of the variation in performance in mathematics among public secondary school students, as reflected by a coefficient of $R^2$=.373. Further, to determine whether perceived home learning environment was a significant predictor of performance in mathematics among public secondary school students, Analysis of Variance (ANOVA) was computed in line with the recommendation by Tabachnick and Fidell (2001).

**Table 4.3: ANOVA –Influence of Perceived Home Learning Environment on Students' Performance in Mathematics**

| Model | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| 1 Regression | 125.671 | 1 | 125.671 | 410.442 | .000[b] |
| Residual | 211.267 | 690 | .306 | | |
| Total | 336.938 | 691 | | | |

Dependent Variable: Students' Performance in Mathematics

Predictors: (Constant), Home Learning Environment

Table 4.3 is ANOVA results output which reveals that, home learning environment significantly predicts performance in mathematics among public secondary school students, $F (1, 690) = 410.442$, $p< .05$. This implies that the null hypothesis that: "home learning environment has no statistical significance influence on performance in mathematics among public secondary school students", was rejected. It was therefore concluded that home learning environment has statistical significance influence on performance in mathematics among public secondary school students, with more conducive home learning environment associated to higher performance in mathematics among public secondary school students and vice-versa.

Further, a simple linear regression analysis was used to develop a mode, with the investigated null hypothesis being $H_0$: $\beta_4$ = 0 and the corresponding alternative hypothesis being $H_1$: $\beta_4 \neq 0$. If the null hypothesis is true, then from $E(Y) = \beta_0 + \beta_4 X$ the population mean of Y is $\beta_4$ for every X value, which indicates that X (Home Learning Environment) has no influence on Y (student performance in mathematics) and the alternative being that Home Learning Environment has significance influence on performance in mathematics among public secondary school students. Table 4.4 shows the coefficients values of the regression model.

**Table 4.4: Regression Coefficients: Influence of Home Learning Environment on Students' Performance in Mathematics**

| Model | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 (Constant) | 3.083 | .163 | | 18.928 | .000 | 2.763 | 3.403 |
| Home Learning Environment | 1.145 | .056 | .611 | 20.259 | .000 | 1.034 | 1.256 |
| a. Dependent Variable: Students' Performance in Mathematics | | | | | | | |

$Y = \alpha + \beta X_4 + \mathcal{E}$, where Y= Students' Performance in Mathematics; $X_4$= Home Learning Environment and $\varepsilon$ is the error term

$Y = 3.083 + 1.145X_4 + \varepsilon$.

From the analysis, there is a significant positive unstandardized co-efficient of 1.145, 95% C.I [1.034,1.256], as indicated by the co-efficient matrix. Given that there is a significant p-value (t= 20.259; p<.05) of the unstandardized co-efficient value, there is sufficient evidence to reject the null hypothesis ($\beta_4$ = 0) and accept the alternative ($\beta_4 \neq 0$). Hence, this further confirms that Home Learning Environment has statistical significance influence on performance in mathematics

among public secondary school students. A positive improvement in the level of Home Learning Environment by one unit results into 1.145 units of improvement in the student performance in mathematics. Similarly, a positive improvement in Home Learning Environment by one standard deviation results into an improvement in mathematics performance among public secondary school students by .611 standard deviations.

The findings are in agreement with Oslen(2010) research on the influence of parental involvement in child's education was significant on the education achievement of a child, similarly, Pinantoan (2013) and Sapungan (2014) found that parental involvement was associated with high achievements on his/her child's performance. Etshiano and Okello (2020) also outlined that frequent assessment either by parents or teachers reduces anxiety in children hence leading to high achievement in mathematics. Therefore the current finding is reliable because it has not deviated from the established norms.

## 5. SUMMARY AND RECOMMENDATIONS

The study adopted mixed method approach and its research design was descriptive survey using Ajzens theory of planned behavior. It was conducted in the fifty six (56) selected secondary schools in Migori County, Kenya The study has revealed that, home based factors have an influence on student's performance at secondary levels. The main units of analysis were the students. The study was guided by the following objective:

To determine, the influence of home learning environment on Mathematics performance in public schools in Migori County.

The hypothesis $H_{01}$ was that there is no statistically significant influence of home learning environment on students' performance in mathematics in public secondary schools.The study reveals that, home learning environments significantly predict performance in mathematics among public secondary school students, $F (1, 690) = 410.442$, $p< .05$. This implies that the null hypothesis that: "home learning environment has no statistical significance influence on performance in mathematics among public secondary school students", was rejected. It was therefore concluded that home learning environment has statistical significance influence on performance in mathematics among public secondary school students, with more conducive home learning environment associated to higher performance in mathematics among public secondary school students after controlling all the other five variables.

A significant variability (≈48%) in mathematics performance among the secondary school students is explained by the home based factors.

In general the following is a summary of the main research findings

The result between home learning environment and performance reveals that there is a relationship between home learning environment and performance in mathematics.

**Conclusions**

The study revealed that a more conducive home learning environment is associated with higher performers in mathematics among public secondary schools.

**Recommendations**

From the conclusions of the study, policy recommendations were made to a number of stakeholders namely: the government of Kenya and the ministry of education, Teachers, NGO's, and Community Based Organizations.

**Policy Recommendations**

The study made a number of recommendations to the following stakeholders:

**a) Ministry of Education**

The Ministry of Education is the parent ministry which is concerned with academics in Kenya. They are charged with the development of educational policies and educational guidelines. They should create awareness among parents that they have a role to cultivate mathematics achievement among students at home through encouragement and providing more conducive home study environment to the students. This will encourage their students to do mathematics at home leading

to higher achievement in mathematics at school. Mathematics is the key to entering technological careers and the brain engine of Kenyan economy.

### b) Curriculum Developers (KICD)

The Kenya Institute of Curriculum Development is the body under the Ministry of Education that is charged with a duty to develop learning materials for schools. They should develop materials that can easily be understood by the learner when they study at home. For example a step by step learning material which is easily understood by a learner.

### c) Non-Governmental Organizations (NGOs')

Non-governmental organizations are organizations which try to provide additional services to the community that supplement on their income and ability to educate learners. They should create awareness among parents they support in Kenya that they have a crucial role to facilitate students' learning by encouraging their children to study and provide a more appealing environment to study at home

### d) Community Based Organizations (CBOS')

These are local organizations comprising of the villagers who team up to strengthen themselves economically. They should encourage fellow members to ensure that their children take learning seriously by creating conducive learning environment in the homes of their members. They should also encourage members to purchase pens, books and even source of lights such as solar panels for studying at home. Members should also be educated on the significance of children education at home. They should be encouraged to think beyond burial donations.

### e) Mathematics Teachers

They should be sensitized on the role that home study of Mathematics play in achievement in mathematics. They should not isolate or detach themselves from parents. They should work together with parents to ensure that what is learned at school is practiced at home to make the knowledge stick in the mind of the learners and this may see a rise in the performance of mathematics at school leading to reduction of low grades at school.

### f) Mathematics Education Researchers

The study recommends further study in the area of home learning environment in other regions and counties.

### Recommendations for Further Research

The study recommends further study on the following:

i) Influence of length of service of a teacher on achievement of a learner in mathematics.

ii) Influence of boarding and day schools on achievement in mathematics

iii)    Influence of school philosophy on achievement in mathematics in secondary schools in Migori County

iv)    Influence of gender of a learner on attitudes towards mathematics.

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