

Home Environment's Factors And Quality Of Pre-Primary School Education In Machakos County, Kenya

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Abstract

In Kenya's Machakos County, there are still considerable gaps in enrollment as only 3 out of 10 preschool children are in school, which highlights the necessity of improving early childhood education as a top priority. The research looks into how the home environment influences the quality of pre-primary education, determining the connection between living conditions, family sizes, social-economic backgrounds, and family support networks. The study, which is based on Urie Bronfenbrenner's ecological systems theory, employed descriptive and correlational designs for the investigation of the entire population of 180 public and private pre-primary school centers in Machakos County. The study used a sample of 56 pre-primary schools in Machakos County. The collection of data was done using structured questionnaires and interviews, and the analysis was performed using descriptive and inferential statistics methods of analysis techniques. Results were presented in tables and graphs, and qualitative insights were conveyed through verbatim quotes and descriptions. The results were supported by regression results also indicated home environmental determinant had a significant, positive relationship with Quality Education in Preprimary Schools as $\beta_1 = 360$, $PV=0.040$, $t= 2.106$ that a unit improvement in home environmental factor on would lead to a significant improvement in accessing quality education in preprimary schools in Machakos County by 0.360. The study concluded that home environmental determinant had a significant, positive relationship with Quality Education in Preprimary Schools. A unit improvement in home environmental determinants significantly leads to significant improvement in accessing quality education in preprimary schools in Machakos County.

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I. Introduction

High-quality early childhood education (ECE) is the pillar of lifelong learning and the foundation of the education system's overall efficiency and the society's general welfare (Pelletier et al., 2025). On the opposite side, poor and unbalanced ECE can greatly limit children's chances to get educated. Kids not only will not blossom academically but also will be deprived of having good life experiences. Education is a fundamental human right and every child not only has a right to education but also to the best possible quality education. The development of social-emotional skills is often referred to as a universal construct that is very important not only for children's adaptation to their social environments but also for the whole development, especially in difficult situations. This skill is very important for the overall development (Li et al., 2023). Over the last few years, there has been an increasing focus on finding and understanding the factors that lead to skill acquisition, particularly in preschool when children experience the fastest growth of social-emotional competence. (Xiao, 2025).

The socio-emotional development of children has been recognized as one of the major attributes of quality ECE that helps children being adaptable, socially interactive, and emotionally regulated. The social-emotional competence has been gaining more and more acknowledgment as a primary developmental outcome during pre-primary years, a time when kids are experiencing the most rapid development and are the most sensitive to environmental influences (Li et al., 2023; Xiao, 2025). Schools' influence on these competencies has always been very positive; however, there is increasingly growing evidence pointing out the home environment and its dynamics as one of the most important factors, if not the most important, that can help or hinder the early learning experiences of children.

In Sub-Saharan Africa, the situation is such that there is very little access to quality pre-primary education due mainly to underfunding, socio-economic inequalities and resources that are not equally distributed. The big problem is that poor households and children in the countryside usually have very low enrollment rates in pre-school education. UNICEF (2024) states that in many African countries, it is less than one-third of the children that are in pre-primary education, which shows that there are still significant

differences in education that mainly stem from children's household income, parents' education, and family support systems. The home environment in this context has a substantial influence on children's readiness for school. Household socioeconomic status, parental involvement, family arrangement, and access to educational resources are among the factors that determine the extent of children's first learning process and eventually their ability to benefit from ECE programs. While the critical role of early childhood development has been widely acknowledged, the Africa education systems still suffer from the same old problems of infrastructure, financing, and family-support which, in turn, create and maintain inequalities in the quality and outcomes of pre-primary education.

In Kenya, Machakos County is characterized by a diverse socioeconomic picture with its urban and rural populations and a poverty incidence of approximately 35.6% (Machakos County Government, 2022). It is this very diversity that in turn manifests itself through the imbalanced distribution of educational resources and the variations in the learning conditions at homes. Most of the families do not have the financial capability to supply the necessary learning materials, create the supportive spaces for learning, and have the parental interaction that is consistent for the young ones. Pre-primary kids in Machakos County thus are getting different home conditions that might bear upon their education and consequently, the outcomes. The family unit which can be a nuclear, extended, or single-parent type, together with the different levels of family support are among the factors that have the greatest influence over the early learning of children. It is important to know how these factors in the home setting collaborate with the quality of pre-primary education since this knowledge will serve as a basis for the development of specific interventions and the planning of education at the county level. Research on pre-primary education in Kenya has mainly looked at the teacher's side, such as his or her traits, in addition to the physical aspects of the school and the outcomes of early literacy and numeracy. Among others, the studies by Njenga (2022), Wawire (2023), and Wangui (2024) highlight the significance of characteristics of teachers, language practices in schools, and the parental occupations. With this in mind, the current study was conducted to assess the impact of the home environment on the quality of pre-primary education in Machakos County, Kenya. The study specifically looked into household environment, family structure, socioeconomic background, and family support systems.

Problem Statement

The home environment is a key predictor of accessibility of quality education in learning institutions. According to , home environment play a significant role in determining accessibility of quality of education in preschools. A conducive learning environment leads to some achievement while poor learning environment hinders students' access to quality education in schools. Despite the Kenyan government efforts in supervision of pre primary education through enhancing good environment at school, home environment factor is another criterion which needs to be considered in promoting preschool learners access to quality education. I et al., (2023) revealed that, home environment is viewed as consequential for child developmental outcomes such as cognitive ability, school readiness and emotional adjustment. Conducive home learning environment leads to access to quality education in preprimary centers in Kenya (Devi, 2017). Effective teaching and learning, combined with the efforts of the government, teachers, learners, and home environmental determinant is linked to quality education in preschools. Despite the government's efforts to provide a high quality education, most learners are unable to achieve their goals in Machakos County and other counties at large in Kenya. This paper sought to assess the impact of home environment determinant on the quality of pre-primary school education in Machakos County, Kenya.

II. Theoretical Framework

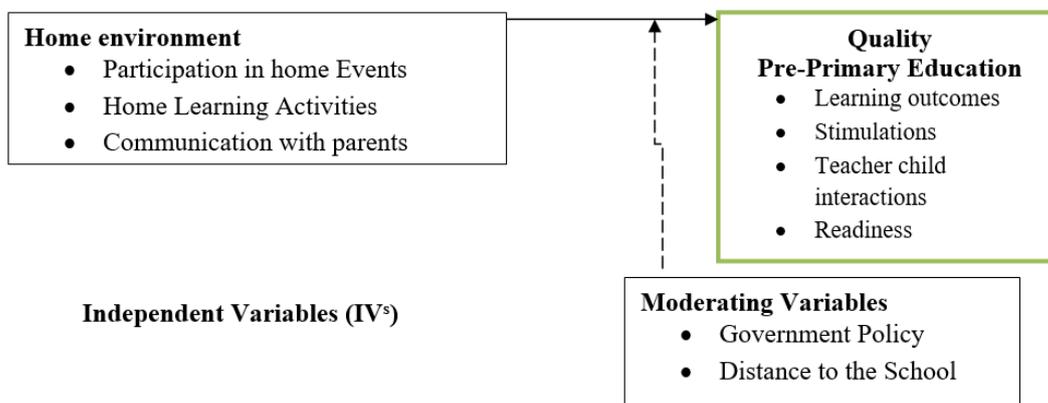
The paper is anchored on ecological system theory developed by Bronfenbrenner (1977) to comprehend human development, and sets out that a developing individual is embedded within a nested organization of structures, each contained within the next (Bronfenbrenner, 1977). The study has a foundation on micro system consists of the relations between the child and their immediate physical environment, including the responsibility and activities they undertake within home environment. The research focused on how the home features, such as family structure, socio-economic status, and parental support, determine children's access to, participation in, and overall experience of pre-primary education. Supportive family structures yield emotional and financial resources thus, the higher enrollment and engagement were been supported, while the positive educational outcomes were the results of the active parental involvement. The microsystem's dynamics were especially significant for preschoolers since they were at the same time actively shaping their learning through interaction at home and in school.

Numerous researches have used successfully Bronfenbrenner's ecosystemic theory in their investigations of educational outcomes. Overall, Bronfenbrenner's ecological systems theory presents a very robust base to grasp the intricate interrelations between home characteristics and the standard of pre-primary education in Machakos County, Kenya. The research sought to clarify through the functioning of the variables

within this theoretical framework that would eventually lead to the design of educational policies and practices that are more aligned with the children's needs in the area.

Conceptual Framework

The conceptual framework given below shows the expected relationships between the independent and dependent variables. The anticipated impact of the interactions between the home environment and quality of preschools education was also presented in Figure 1.



Home environment and quality of pre-primary education

The home environment has a significant impact on the academic achievement of students worldwide. The study conducted by Jain and Mohta, (2019) in India aimed to evaluate the influence of the domestic setting on the academic performance of secondary school pupils in Kota, India. The findings of the study indicated a positive association between the family environment and academic achievement. According to this study, children who were exposed to a positive home environment exhibited higher levels of academic achievement, whilst those who experienced an unpleasant environment were likely to experience a negative impact on their academic performance. The home atmosphere is the very first and most important context of early childhood development as it determines the children's cognitive, social, and emotional skills even before and during their entry into the pre-primary education. In Kenya, the home environment consists of parental participation, the presence of educational materials, family composition, socio-economic status, and the presence of family support all of which are in a complex interplay with pre-primary education (Republic of Kenya [RoK], 2017).

Research findings from Kenya have it that children, who come from supportive home environments, are better prepared for school, are more engaged in the classroom, and are more productive in learning in pre-primary settings. The research done by Kibet, Mugo, and Orodho (2020) in UasinGishu County showed that parental involvement activities such as participation in school meetings and home-based learning going on together had a significant positive impact on the pre-school teaching-learning process. The researchers, however, did emphasize the parental participation in school activities and did not consider other informal family support mechanisms such as emotional nurturing, home routines, and extended family involvement, among others. It was also not closely examined how support systems differed across various socio-economic groups. These issues have been cited as reasons for the need and justification for carrying out a thorough inquiry into family support systems along their quality of pre-primary education in Machakos County.

Existing Kenyan studies have established that home environments, family structures, socio-economic backgrounds, and family support systems individually influence children's learning outcomes in early childhood education. However, there is limited empirical evidence linking these household factors directly to the quality of pre-primary school education, particularly in terms of classroom processes, learning environments, and teacher-child interactions at the county level. Moreover, most studies address learner outcomes without sufficiently examining how home environment factors interact with institutional quality indicators. This study therefore seeks to fill this conceptual gap by systematically examining the influence of the home environment on the quality of pre-primary school education in Machakos County, Kenya.

III. Research Methodology

The research study employed mixed method approach where the study used both descriptive and correlational research designs to assess the relationship between home environment and quality of education in preschools in Machakos County. The designs were appropriate as it help in collecting of quantitative and qualitative data. The designs were chosen to help in collecting data on facts described the current status of the situation on home environment and quality of education in preschools. The research designs assisted in further

identifying study variables that may warrant further studies. The study used correlation research design and descriptive survey research design to allow adoption of multifaceted approaches to collection of data, data processing and analysis. The research designs also allows for a multifaceted approach to data analysis in testing the research hypothesis.

The population of the study was a total of 180 pre-primary centres which constituted 78 public and 102 private preschool, with 270 teachers in total for pre-primary schools. A sample of 56 preschools were selected consisting of 32 public and 24 private preschools in Machakos County. The structured questionnaire was used as the primary data collection instrument for the pre-primary school teachers . Questionnaire help in collecting both quantitative and qualitative data on home environment and quality of education in preschools . To collect indepth qualitative data from head teachers, an interview guide was used which focused on the institutions' viewpoints pertaining to home environment factors and educational quality in preschools in Machakos County.

In the process of assessing the data, it was edited for completeness and coding by using SPSS version 20. Descriptive and inferential statistics methods of analysis and review were used in analyzing the findings. In reference to quantitative data analysis, it involved a generation of percentages, descriptive statistics in terms of frequencies, mean and standard deviations. Qualitative data analysis was carried out on data that was collected using interview guide according to the theme of the study and presented in prose form. The study also used inferential statistical techniques, correlation and regression to determine the relationship between home environment and quality of education in preschools in Machakos Count. Identified correlation analysis was then carried out to examine the strength of association which is found between identified variables. T statistics (t) was used to test the hypothesis on the significance relationship of a variable. The t-test is a test for significance of an independent variable (Creswell, 2016). The study use t-statistics to test whether the hypothesized model was significant at 95% significance level. Examination of variances (ANOVA) or the F-test was utilized to test hypothesis of the study. The study deployed a llinear regression analysis $Y = \beta_0 + \beta_1 X_1 + \varepsilon$ where; Y = Quality of Preprimary schools education, X_1 = Home Environment, β_0 = Constant, β_1 , = Beta coefficients and ε = Error term.

IV. Results And Discussion

Introduction

The study focused on determining the extent family structure influence quality education in pre schools in Machakos County. Data was collected from 50 teachers out of the 56 questionnaire administered constituting to 89.3% response rate. Most 26 of the respondents had 31-35 years (52%), other 13 of the respondents had 36 years and above 9 (18%) had between 26-30 years while 2(4%) had 20 to 25 years .This demonstrated that respondents were mature in age and in a position to provide information on family structures and quality education in pre schools in Machakos County. During the inquiry into the type of school represented, the majority of the respondents (64%) were in preschools in public sector while 36% (18) were from preschools in private sector providing a broad based view on family structure and quality of education in preschools. The results revealed that academic qualifications majority 72%, of the respondents have a Diploma in Education, while the minority (28%, or 14 respondents) have a Certificate. The Bachelor's degree or above category constitutes only 10% of the sample which means that most of the educators are equipped with mid-level qualifications. On training level, 60% (30 respondents) have a Diploma in Early Childhood Education (ECE) and 88% have qualifications at or below the Bachelor's level. Accessibility of qualified and trained teachers implied that learners were likely to have quality education in preschools level. This view is further supported by majority of teachers having long period of years in teaching between 11 and 20 years of teaching experience, indicating the professional knowledge is foster provision of quality education in preschools

Descriptive Statistics

Home environment's impact and access to quality pre-primary school education

The descriptive statistics utilized in this study summarized the perceptions of respondents regarding the main factors related to home and school that facilitate or hinder pre-primary education in terms of access and quality. The statistics included mean scores, standard deviations, and sample sizes for each variable, as shown in Table 1.

Table 1 Home school factors influence on access and quality

School Factors	Mean	Std. Deviation
Age going children	2.6400	.66271
Deserving children	3.5000	.61445
Pre primary school	2.3400	.71742
Home factors	3.2600	.56460
Poor access and quality	3.1000	.54398

Every item was evaluated using a four-point scale which led to the valid sample size of 50 respondents being the same for all variables. The item dealing with deserving children received the highest mean score ($M = 3.50$, $SD = 0.61$), pointing out that the majority of the participants were of the opinion that deserving children—mainly the ones from vulnerable or disadvantaged backgrounds—should be the first ones to get into early childhood education. This finding is in accordance with previous research that pointed out access to early education based on equity as the most important factor in improving participation and learning outcomes for disadvantaged households. (Sultana et al., 2022; Krafft et al., 2024). The relatively small standard deviation was another indicator of a high degree of agreement among the participants on this matter. On the other hand, pre-primary school factors received the lowest mean score ($M = 2.34$, $SD = 0.72$), and this revealed that there was a comparably weaker agreement that pre-primary school conditions were adequate or ready for quality education. The larger standard deviation pointed to greater differences among the respondents' opinions, which may be due to differences in school infrastructure, teacher readiness, and learning resources across the various settings. There are also discrepancies in early learning environments reported in low- and middle-income contexts, where the quality of schools varies greatly and also the conditions at home influence early learning outcomes (Uno & Ogawa, 2025; Krafft et al., 2024).

The factors pertaining to home ($M = 3.26$, $SD = 0.56$), poor access and quality ($M = 3.10$, $SD = 0.54$), and age-going children ($M = 2.64$, $SD = 0.66$) showed moderate to high mean scores with an overall impression of the situation being that very aspects namely household characteristics, challenges in access and quality, and children of suitable age for school, significantly affected the participation in pre-primary education. These results are also in line with the previous literature which has pointed out, among other things, that home stimulation, parental awareness, and socio-economic conditions determine the early enrolment and learning quality (Cooper & Stewart, 2021; Onyango, 2015). To sum up, the descriptive statistics indicated that the home environment factors were considered by the respondents to be the most important determinants of access to quality pre-primary education. The mean scores obtained and the relatively low standard deviations in most of the variables pointed to a common understanding among the respondents and thus strengthened the argument of household-level influences being pivotal in determining early education outcomes in the Machakos County context.

Table 2: Teacher-learner and Quality Education in Preprimary Schools

Teacher-learner ratio Quality Education in Preprimary Schools	Mean	St Dev
All pre-primary schools have adequate staffing	1.980	.979
Most schools have optimal teacher child-ratation of 1:25	2.280	.858
Most pre-schools have a high teacher child ratio of above 1:40	2.820	.941
Teacher-ratio is a consideration when enrolling pupils	2.560	.611
High teach-child ratio affects access, participation and quality of Pre-primary school education in the county.	3.000	.286

The findings in Table 2 on teacher-learner ratio and quality education in preprimary schools in Machakos County are presented in Table 2. Results on item one, 42% of respondents disagreed that all pre-primary schools have adequate staffing, 36% of the respondents strongly disagreed, 12% of the respondents strongly agreed while 10% of the respondents agreed. The results clearly exhibit that preschools experience under staffing affecting quality education as supported by a mean of 1.980 with a standard deviation of 0.979. Results on most schools have optimal teacher child-ratation of 1:25, most 44% of the respondents disagreed, 30.0 % agreed, 18% of the respondents strongly disagreed while 8.0% strongly agreed. This implied that teacher-child ration of 1.25 has not been attained as supported by a mean of 2.280 and standard deviation of .858. The results in Table 2, most 58% of the respondents agreed that most pre-schools have a high teacher child ratio of above 1:40, 20.0% strongly agreed, 16.0% strongly disagreed while 6.0% disagreed. This demonstrated that the teacher-kind ration of 1:40 is the present cases hindering quality of education in preschools centers as supported by a mean of 2.820 and standard deviation of 0.941. The respondents 50.0% agreed that teacher-ratio is a consideration when enrolling pupils, 44.0% disagreed, 4.0% strongly agreed while 2.0% strongly disagreed clearly demonstrating that teacher ratio is a factor to consider while enrolling preschool learners as supported by a mean of 2.560 and 0.611. This clearly indicated that teacher-child ratio with wider margin contribute to lower quality of education in preschool centers in Machakos County. Further, results indicated that majority 92.0% of the respondents agreed that high teach-child ratio affects access, participation and quality of Pre-primary school education in the county, 4.0% strongly agreed while 4.0% disagreed. This demonstrated that most of the respondents agreed as supported by a mean of 3.000 with a standard deviation 0.286 that high teach-child ratio affects access, participation and quality of Pre-primary school education in the Machakos County.

Correlation Analysis

The study used correlation analysis results to detect the strength and the direction of the relationship between variables. The correlation matrix results for the home environmental determinant and quality education in preprimary schools in Machakos County. Pearson Product moment correlation coefficients (rs) and P-values were used in criterion decision in making inferences. The significant value was tested at 0.01 or 0.05.

Table 3: Correlation Analysis

		Quality Education In Preprimary Schools
Home Environmental Determinant	Pearson Correlation	.791*
	Sig (2-tailed)	.040
	N	50

*- Correlation is significant at the 0.01 (2 tailed)

The results in Table 3 indicates that, there exists a strong, significant and positive correlation between home environmental determinant and quality education in preprimary schools in Machakos County as indicated by correlation factor, $r=0.791$, $PV=0.040<0.05$). The result predicts a strong and positive correlation between home environmental determinant and quality education in preprimary schools in Machakos County. This clearly demonstrated that conducive home environment is a significant predictor of quality education in preprimary schools,

Regression Analysis

The study sought to determine the influence of home environmental determinant and quality education in preprimary schools in Machakos County. In seeking to achieve the objective, the study tested the hypothesis that there is no significant relationship between home environmental determinant and quality education in preprimary schools in Machakos County in Kenya.

Table 4: Model Summary of relationship between Home Environmental Determinant and Quality Education in Preprimary Schools in Machakos County

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.591 ^a	.349	.338	2.30061

R-Squared is 0.349 indicated that there existed variation or correlation between home environmental determinant and quality education in preprimary schools in Machakos County in Kenya. The model summary results in Table 4 shows R^2 is 0.349, Std Error= 2.30061 indicating that there was a significant variation at 34.9 % between quality education and home environmental determinant in preschools.

ANOVA Results

The result in Table 5 presents results on goodness of fit of the regression model.

Table 5: ANOVA Results on relationship between Home Environmental Determinant and Quality Education in Preprimary Schools in Machakos County

Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	23.465	1	23.465	4.433	.040 ^b
	Residual	254.055	48	5.293		
	Total	277.520	49			

- a. Independent Variables: (Constant), Home Environmental Determinant
- b. Dependent Variable: Quality Education in Preprimary Schools in Machakos County

These results in Table 5 indicate that the model had an F-ratio of 4.433, $P=0.040<0.05$. This result ascertain the regression model, $Y = \beta_0 + \beta_1X_1 + \varepsilon$ adopted by the study had a significant goodness of fit as $F=4.433$ and far exceeds the F=statistic 0.9635 and $PV=0.008<0.05$. The results on Table 6 shows the regression beta coefficients analysis

Table 6: Beta Regression Coefficients of Relationship between Home Environmental Determinant and Quality Education in Preprimary Schools in Machakos County

Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.

	B	Std. Error	Beta		
(Constant)	7.293	2.560		2.848	.006
Family Structure	.360	.171	.291	2.106	.040

c. Independent Variables: (Constant), Home Environmental Determinant

d. Dependent Variable: Quality Education in Preprimary Schools

The resultant univariate regression model took the form:

$$Y=7.293+0.360X_1+\epsilon.$$

The regression results also indicated that home environmental determinant had a significant, positive relationship with Quality Education in Preprimary Schools as $\beta_1 = 360$, $PV=0.040$, $t= 2.106$. This clearly indicated that a unit improvement in home environmental factor on would lead to a significant improvement in accessing quality education in preprimary schools in Machakos County by 0.360.

V. Summary Of Major Findings

From the results, there exists a strong, significant and positive correlation between home environmental determinant and quality education in preprimary schools in Machakos County as indicated by correlation factor, $r=0.791$, $PV=0.040<0.05$). The result predicts a strong and positive correlation between home environmental determinant and quality education in preprimary schools in Machakos County. This clearly demonstrated that conducive home environment is a significant predictor of quality education in preprimary schools. The results were supported by regression results also indicated home environmental determinant had a significant, positive relationship with Quality Education in Preprimary Schools as $\beta_1 = 360$, $PV=0.040$, $t= 2.106$ that a unit improvement in home environmental factor on would lead to a significant improvement in accessing quality education in preprimary schools in Machakos County by 0.360. The home environment was revealed to be the factor that led to children's eagerness to learn, which resulted in their participation in the classroom and being active in the learning process. It was clear quality of child's education was negatively impacted by family instability especially poor socio economic background and poor relationships at home.

VI. Conclusions

The study concluded that home environmental determinant had a significant, positive relationship with Quality Education in Preprimary Schools. A unit improvement in home environmental determinants significantly leads to significant improvement in accessing quality education in preprimary schools in Machakos County. The study concluded that parental participation in home learning, learning activities at home and communication patterns at home contributed to significant improvement in accessing quality education in preschools in Machakos County in Kenya

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