

Parental empowerment and engagement as predictors of foundational learning

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Abstract: Parental empowerment plays a critical role in supporting foundational learning, particularly in rural and marginalized contexts where access to educational resources is often limited. This study examines the impact of a Parental Empowerment and Engagement intervention on parental capacity, engagement behaviours, and home-based learning support in early childhood development and education centers in the Mbeere regions of Embu County, Kenya. A cluster-randomized trial involving 244 parents from 24 ECDE centers was conducted to assess the effectiveness of the intervention. The program aimed to equip parents with the knowledge, skills, and confidence needed to actively support their children's learning both at home and in collaboration with schools. The findings indicate significant improvements across multiple dimensions of parental engagement. Participation in creative learning activities increased by 40.6%, the development of home learning materials by 28.1%, and engagement in reading and writing activities by 27.2%. In addition, parent-teacher communication improved by 26%, contributing to more consistent information sharing on children's learning and well-being. Parents also initiated a range of community-driven activities, including classroom renovations, provision of playground equipment, and school feeding programs, reflecting increased involvement in supporting school environments and resources. Collectively, the intervention strengthened parental capacity and engagement practices, leading to more supportive home learning environments and enhanced collaboration between parents, teachers, and the wider community. These findings emphasize the importance of parental empowerment as a strategy for improving learning support systems in underserved contexts and highlight its potential to contribute to more equitable and sustainable educational development.

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Introduction

Parental empowerment in education is increasingly recognized as critical for improving student outcomes and fostering collaborative educational environments. It refers to enabling parents with the knowledge, skills, information, and tools needed to actively engage in and influence their children's education. Globally, studies highlight diverse models and approaches to parental empowerment shaped by cultural, socioeconomic, and policy contexts (Durand, 2011). This concept is grounded in the recognition that parents are critical stakeholders in the education system whose involvement can significantly influence children's academic success and overall development (Akpuokwe et al., 2024; Devlieghere et al., 2022; Ihmeideh et al., 2020).

Empowered parents are not passive recipients of educational policies but active participants who

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collaborate with educators, respond to their children's needs, and support learning at home and school (Brown et al., 2022; Gibbons & Connolly, 2021; Rall, 2021). This engagement strengthens the connection between home and school, creating a more coherent support system for learners (Froiland, 2021; Smith et al., 2020). Evidence indicates that such involvement is associated with improved academic performance, increased school attendance, and enhanced student motivation and self-worth (Chrispeels & Rivero, 2001; Jasis, 2021; Kelty & Wakabayashi, 2020). In addition, empowered parents are more likely to advocate for their children, communicate effectively with teachers, and contribute to positive school environments (Albrecht, 2021; Kilag et al., 2023; Walker et al., 2021).

Parental empowerment also transforms the relationship between families and schools by fostering collaboration and shared responsibility for children's learning. This process involves providing parents with opportunities for capacity building, such as training on child development, effective communication with teachers, and access to resources that support learning at home (Eden et al., 2024; Simweleba & Serpell, 2020; Steiner et al., 2022). By strengthening parents' sense of agency and confidence, these initiatives build partnerships that benefit students, teachers, and the wider community.

Barriers to Parental Engagement in Rural and Marginalized Areas

Parental engagement in rural and marginalized communities is constrained by both school-centered and parent-centered barriers. School-centered barriers are often rooted in the structure of education systems, particularly in the Global South, where postcolonial schooling traditions position teachers as primary authorities and limit meaningful parental involvement (Cummings et al., 2017; Schueler et al., 2017). In such contexts, teacher education programs rarely emphasize parent engagement, and schools often lack clear policy frameworks or structured strategies, resulting in inconsistent and ad-hoc approaches that weaken collaboration and may lead to conflict between teachers and parents (Ackah-Jnr et al., 2020; Baker et al., 2016). Additionally, schools struggle to address the diverse needs of parents from different socioeconomic backgrounds, where some feel marginalized or inadequately prepared to engage (Christianakis, 2006).

Resource constraints further limit effective engagement, as many communities lack the capacity to sustain early learning opportunities and meaningful school-family interactions (Chowa et al., 2012). Limited communication between teachers and parents, alongside negative perceptions held by either group, also undermines the development of strong partnerships necessary for supporting children's learning.

Parent-centered barriers include challenges related to socioeconomic conditions and educational background. Families in disadvantaged contexts often face constraints such as unstable work schedules, poor health, and limited financial resources, which restrict their ability to participate in school activities (Jensen, 2013). Parents with low levels of education may lack the confidence and skills to support learners at home, while logistical challenges, such as lack of transportation, childcare, and time, further hinder their involvement (Mwarari et al., 2020). Additionally, negative perceptions of schools, feelings of stigmatization, and personal or family stressors reduce the likelihood of active engagement (Hornby & Lafaele, 2011).

In Kenya, these challenges are reflected in limited access to quality Early Childhood Development and Education (ECDE), particularly in marginalized areas where inadequate infrastructure, insufficient learning resources, and poorly trained teachers persist (Okutu, 2025). Although the Ministry of Education advocates for parental engagement, structured and practical strategies for empowering parents remain limited. Nevertheless, existing evidence emphasizes the importance of parental engagement in addressing educational inequalities and providing children with the social capital necessary to overcome socioeconomic disadvantages (Forbes & Sime, 2016).

Despite growing recognition of the importance of parental empowerment, there is limited empirical evidence on structured interventions in rural contexts. In Kenya, policy frameworks emphasize parental involvement, but scalable models that build parents' capacity remain underdeveloped. This gap highlights

the need for contextually relevant interventions that not only promote parental engagement but also clarify the mechanisms through which such engagement influences children's learning and school environments. Therefore, this study examines the implementation of a Parental Empowerment and Engagement (PE&E) intervention and its effects on parental practices, school interactions, and home-based learning support.

Research Questions

The study was guided by the following research questions:

1. How does the Parental Empowerment and Engagement intervention influence parents' capacity and engagement in supporting children's learning at home?
2. How does the PE&E intervention affect parent-teacher communication and parental participation in school-related activities?
3. How does the PE&E intervention contribute to the development of supportive school environments and parent-initiated community activities?

Theoretical Framework

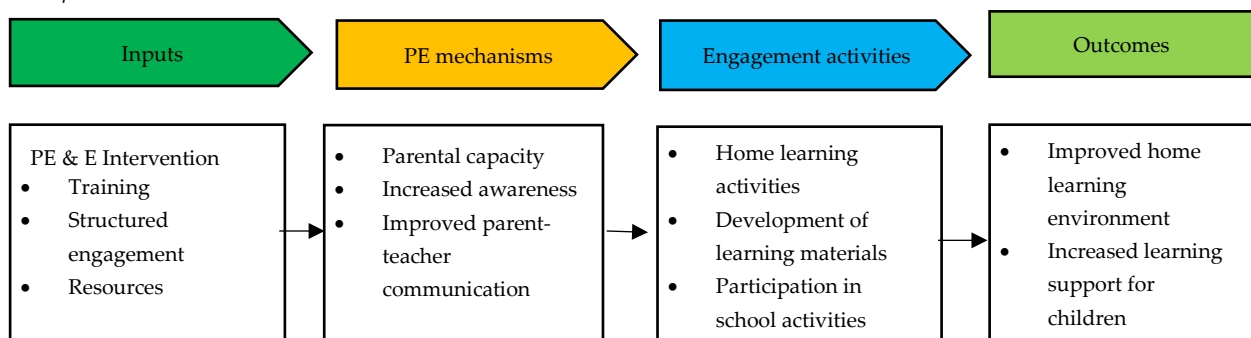
This study was guided by Epstein's framework of parental involvement, which delineates six interconnected domains: parenting, communication, volunteering, learning at home, decision-making, and collaboration with the community (Ihmeideh et al., 2020). This framework provides a multifaceted perspective on the ways various forms of parental engagement enhance children's educational experiences and developmental outcomes. According to Hill and Tyson (2009), engagement in these domains correlates with increases in student motivation, attendance, and overall academic support.

The present research applies Epstein's model to shape the Parental Empowerment and Engagement intervention. The program integrates training sessions, school-parent interactions, and community initiatives. These target multiple dimensions of parental involvement rather than a single domain. It focuses on improving home-based learning practices, fostering communication between parents and teachers, and encouraging active participation in school and community events. The framework also informed the development of data collection tools, particularly the Parental Engagement Assessment Questionnaire (PEAQ), and the selection of outcome measures related to the six domains, thereby enhancing the study's theoretical rigor and contributing to the literature on the significance of comprehensive parental engagement in bolstering early childhood education outcomes (Goodall & Montgomery, 2014; Smith et al., 2020).

Conceptual Framework

The conceptual framework (Figure 1) illustrates the pathways through which the PE&E intervention influences parental capacity, engagement, and school-related processes that support children's learning. The intervention provides key inputs, including training, structured engagement, and resources. These inputs activate parental empowerment mechanisms by enhancing parental capacity, motivation, and communication with teachers. These mechanisms promote increased parental engagement in home and school-based learning activities, which in turn supports improved home learning environments, stronger school-parent relationships, and increased learning support for children.

Figure 1
Conceptual Framework



Method

Study Area

The study was conducted in the Mbeere North and Mbeere South Sub-Counties of Embu County. Mbeere region is highly vulnerable to drought since it is a semi-arid zone with irregular and low rainfall. It is also marginalized in terms of access to essential services. Many residents depend on khat (miraa) farming and trade as their main source of livelihood. The overall levels of education in the region are low.

Research Design

The PE&E intervention process was informed by Blessing and Chakrabarti (2009) Design Research Methodology, which has four stages. In the first stage, Research Clarification (RC), literature reviews and policy documents were used to identify the gaps in parental engagement, with Epstein's six-domain framework used as the organizing framework (Table 1). In the second stage, Descriptive Study 1 (DS-I), consultative workshops were conducted with parents, teachers, and education officers to identify the current practices and barriers across the six domains of Epstein's framework. In the third stage, Prescriptive Study (PS), the findings from the workshops, the results of the needs assessment surveys, the opinions of the experts, and the findings from the policy reviews were used to design and pilot a six-session training module on parenting, communication, volunteering, home-based learning, decision-making, and community collaboration. In the final stage, Descriptive Study II (DS-II), the effectiveness of the six-session module was evaluated using a cluster randomized control design, with mixed methods used at the endline. A cluster randomized trial design was chosen for three main reasons. Firstly, the interaction between parents within the same ward is common, especially at schools, markets, and social gatherings, implying that individual-level randomization within the same ward is likely to introduce a high risk of contamination in the control arm of the experiment. Secondly, the CRT design is useful in establishing causality by creating concurrent treatment and control groups with the same macro-contextual conditions, including seasonal, policy, and economic effects. Thirdly, the implementation of early childhood development education in Kenya is done at the ward level, implying that the study design is suitable for policy generalizability.

A simple randomization method was used to select two clusters (wards) for treatment and two clusters (wards) for control. Randomization was performed using a computer-generated list. To determine the status of parental empowerment and engagement prior to the start of experiment, a baseline survey was done. The baseline survey involved 297 parents drawn from 24 schools, selected proportionally across four clusters. At school level, the number of selected parents was proportionate to the number of Pre Primary 2 parents in the school giving distribution of sampled parents.

Table 1
Operationalization of Epstein's Six Categories Of Parental Involvement in the PE &E Intervention

No.	Epstein Category	PE&E Session Content	Measured Outcome
1	Parenting	Child development milestones; morning routines; nutritional support; positive discipline strategies	Child well-being
2	Communication	Structured parent-teacher dialogue protocols; record-keeping; feedback forms	Communication outcomes
3	Volunteering	School clean-up; classroom support; community fundraising workshops	Volunteering & PTA
4	Learning at Home	Reading and writing activities; creative play; home learning material development	Learning activities
5	Decision-Making	PTA governance training; parent representation in school meetings	PTA participation
6	Collaborating with Community	Community resource mapping; feeding programmes; infrastructure projects	Parent-initiated projects

Note. Each category was addressed across the six training sessions (May–August 2023). Sessions were delivered during regular school hours with the support of trained research assistants.

After the baseline, the training module for the treatment was subsequently developed. The randomly assigned treatment was conducted in the two clusters (Kiambere and Makima). In each cluster, six centrally

located ECDEs were identified; to minimize contamination, ECDEs located on the border of clusters were excluded. About 187 parents of PP1 pupils from these ECDEs who signed informed consent were involved in the treatment.

During the intervention, a total of six training sessions were carried out for a period of three months by the researchers during regular school hours with the support of trained research assistants. To evaluate effectiveness of the treatment, an endline survey was done involving 244 parents from both the control and treatment clusters; a mixed method was used to collect data. A survey was used to collect quantitative data on variables that determined the module training effectiveness, while interviews were conducted to gain in-depth insights on what worked well and what needed improvement. The triangulation of quantitative and qualitative data was used in the analytical process in three different ways. Firstly, it was used for validity checking. This entailed conducting a validity check after every round of quantitative estimation of the DiD results, in which the interview data was used to check whether the results were corroborated by the parents' narrative. Secondly, triangulation was used for explanatory elaboration. The results were elaborated by using the interview data for explanatory purposes, especially for those results that were statistically significant. Thirdly, triangulation was used for discrepancy resolution. When there were discrepancies between the results, for example, in the results for the items on school culture, the interview data was used to check for ceiling effects, as the baseline was > 80%, implying that parents were generally satisfied.

Sampling Techniques

The baseline survey targeted 300 parents drawn from 24 sampled schools. The baseline sample size was arrived at using minimum effect size of 10 percentage points for the primary outcome of proportion of parents engaged, with 80% statistical power, and a two-sided alpha of 0.05, and an Intraclass Correlation Coefficient (ICC) of 0.05 based on similar rural Kenyan studies. The design effect ($DEFF = 1 + (m-1)*ICC = 1 + 24*0.05 = 2.2$) of the cluster-randomized trial formula, with an average of 25 parents per school and 12 schools per arm, resulted in an estimated required sample size of 150 participants per arm giving 300 for the two arms. Parents were selected through multistage sampling methods, first four wards from eight wards were selected using simple random sampling. In selected wards, schools were selected proportionate to number of schools in each ward with one ward having the least schools at five, while the highest was seven schools. At school level, the number of parents were also based on the proportion to the number of Pre Primary 2 parents in the school giving distribution of sampled parents. During the endline, a simple randomization method and a computer-generated list of random numbers were randomly assigned wards in a 1:1 ratio to either the parenting intervention programme or control. Random assignment was done using computer-generated randomization scheme. The four wards in Mbeere south were randomly allocated into two groups. The treatment started on 11 May 2023 to 30 August 2023. Subsequently, the two wards (Kiambere and Makima) were randomly assigned to treatment. Second, six centrally located ECDEs clusters were identified within each ward that fit the three selection criteria. To minimize contamination, ECDEs located on the border of locations were excluded. In these wards, Kiambere had 23 public primary school with PP 1 and Makima had 27. In each ward, six schools centrally located in the wards were selected and all the parents of PP1 pupils who signed an informed consent got involved, giving a total of 187 participants.

Baseline Instrument

An extensive literature review informed the development of the Parental Engagement Assessment Questionnaire. Specifically, the PEAQ was structured to align with Epstein's Framework for Parental Involvement, which encompasses six key domains: parenting, communication, volunteering, learning at home, decision-making, and collaboration with the community (Ihmeideh et al., 2020). Based on this framework, questionnaires for parents and teachers were designed to capture key dimensions of parental engagement. This ensured that the PEAQ was not only theoretically grounded but also contextually relevant to the rural and marginalized communities in Kenya where the study was conducted. Maximum likelihood approach was used in Confirmatory Factor Analysis (CFA) to confirm the construct validity, i.e.,

the factor structure based on the five latent components. On the other hand, a bifactor model, in which all the elements were saturated in a single factor, was initially employed as the baseline model. The CFA results implied that the questionnaire had construct validity based on the development processes (Yoon et al., 2021). The internal reliability was acceptable for most domains. However, it was particularly low for the “Factors Influencing Parental Engagement” domain, which included an item for work commitment not hindering engagement in school, which was at 0.48. While these items did not exhibit a significant response association, the literature supports that work commitment significantly negatively influences parental engagement (Gao et al., 2023). Thus, it was decided to keep this item in the domain. This multidimensional approach measures opportunity for parental engagement, communication, school environment, school culture, and influencing factors. Conceptually, these measures were considered possible outcomes. An individual who exhibits high levels of engagement with their children's learning activities ought to score higher on these outcome measures, as was observed.

The Reliability of the PEAQ was assessed using Cronbach's alpha. Data from the pilot survey was analyzed using SPSS version 26. Likert scale statement for the opportunity provided for parental engagement (12 statements), Communication between Parents and Teachers (7 statements), School environment to promote parental engagement (10 statements), and School Culture on Parental Engagement (6 statements). The pilot results demonstrated that internal consistency was high for all the factors measured in the PEAQ, ranging from 0.906 to 0.973, implying that this questionnaire was reliable. The data collected was used to develop the intervention, the training module, which was used to develop parents' capacities to meaningfully engage with their children learning.

Data Collection Procedures

For the baseline study, 300 parents completed the questionnaire with the aid of trained research assistants. All adult research participants were informed about the purpose of the study and the terms of their involvement. The guidelines of informed consent were followed, and participation was entirely voluntary. The study adhered to the ethical guidelines for Pwani University Ethical Review Board (ERC/EMBU-STAFF/001/2022[CG1]). Participants were made aware of the nature of the research and the conditions of their participation.

Data Analysis

The baseline data were descriptively analyzed to determine parents' and teachers' engagement activities and capacities. The endline unit of analysis for the outcome was individual parents. For each outcome, intervention groups were compared with control groups, adjusting standard errors for clustering at the ward level. A difference in differences (DiD) analysis was carried out to determine the impact of the intervention. Standard errors of the baseline–endline differences within each group were calculated from proportions across the study area and used to estimate 95% confidence intervals (CIs) for the difference-in-differences in parental engagement between the intervention and comparison groups. The DiD method was employed to estimate the effect of the intervention by comparing changes in outcomes between the two groups before and after implementation (Fredriksson & Oliveira, 2019). With two groups and two time periods, the DiD estimate of the intervention effect can be expressed as follows:

$Did = (Y_{s=Treatment, t=After} - Y_{s=Treatment, t=Before}) - (Y_{s=Control, t=After} - Y_{s=Control, t=Before})$ where Y_s is the outcome variable measured in proportion and t is time (Fredriksson & Oliveira, 2019).

For the qualitative data, the process of thematic analysis, according to Braun and Clarke (2006), was followed, namely, familiarizing with the data through transcription, reading and re-reading and isolating initial ideas, generating initial codes by collating data relevant to each code, searching for themes, reviewing, defining and naming themes. Additionally, the content analysis process by Elo and Kynga (2007) enabled the researchers to get immersed in the data to determine the manifest content and latent content. This was followed by open coding of the categories, grouping codes into higher order, and developing categories and subcategories. Vaismoradi et al. (2016) argue that in both thematic and content analysis, the researcher can demonstrate creativity in presenting the result in terms of a storyline, a map,

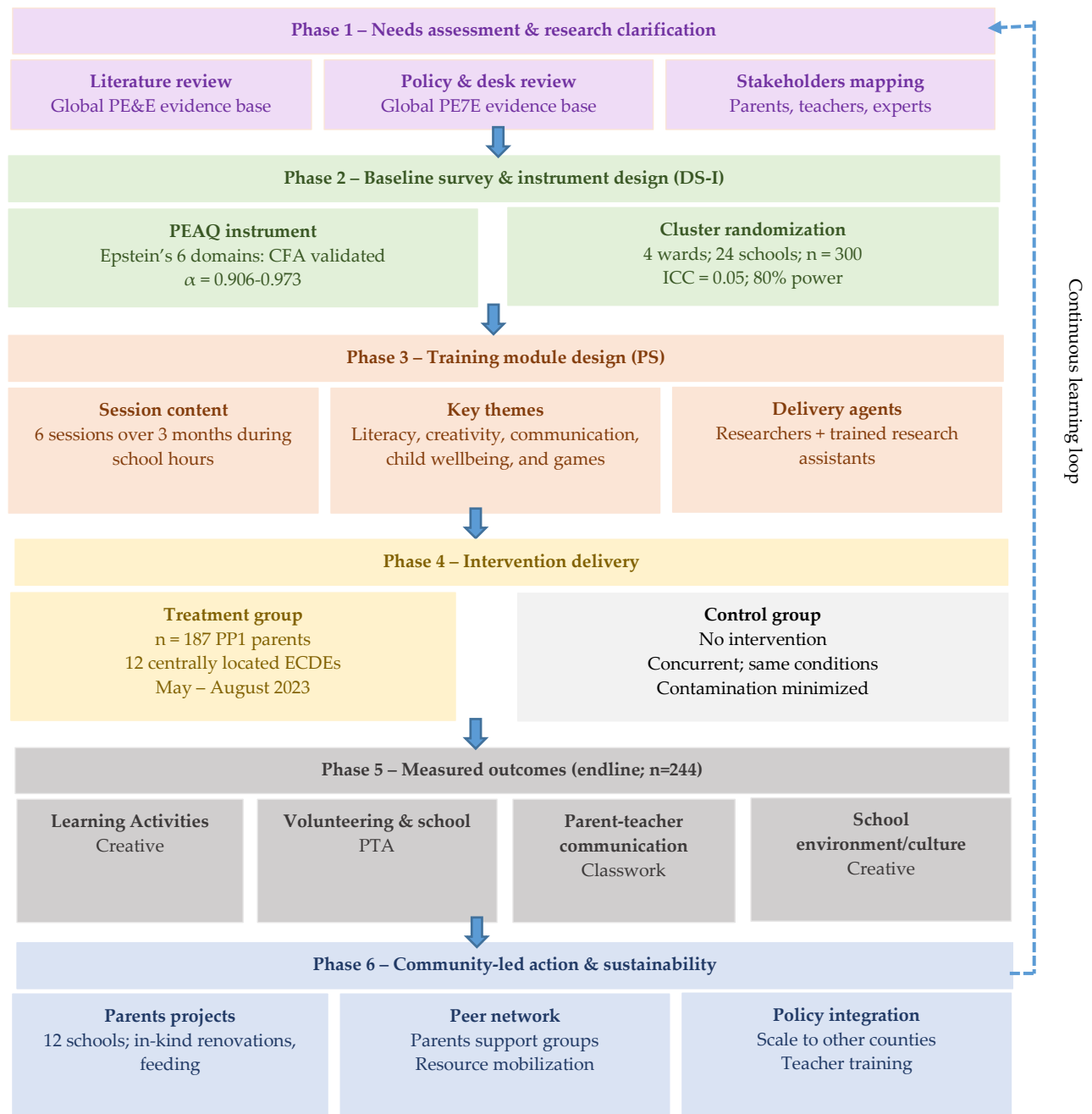
or a model.

PE&E Intervention Implementation Model

Figure 2 shows the six-step implementation process of the Parental Empowerment and Engagement intervention, which was conducted in the Mbeere region of Embu County, Kenya. The process begins with a needs assessment, which includes a literature review, policy analysis, and stakeholder analysis, followed by the development of a survey design using the PEAQ survey tool. The process concludes with community-based sustainability activities, including parent-initiated school improvement projects, the development of peer networks, as well as the integration of the program into policies, all of which are sustained through a learning loop.

Figure 2

PE&E Intervention Implementation Model



Results

Participants

The results in Table 2 summarize the sampled respondents' demographic characteristics at baseline and endline. The demographics of the respondents were largely similar between intervention and control. The respondents were characterized by a low level of education, with more than two-thirds lacking post-primary education. The majority had, at most, primary level education, implying that they had either dropped out or could not continue with education after the primary level. This explains why the region is characterized by low literacy levels, which can be attributed to the limited ability to support children's education. Most parents were aged between 20 and 49 years. The principal economic activity for the study region is farming, from where many families derive their subsistence. Most respondents were female, suggesting that fewer males are directly involved in early years education.

Table 2

Demographic Characteristics of the Sampled Parents at Baseline and Endline by Study Group

Characteristics	Baseline		χ^2	p -value	Endline		χ^2	p -value
	Control group (n=132) %	Intervention group (n=165)%			Control group (n=125) %	Intervention group (n=119)%		
Age(years)								
20 - 29	(36) 27.5	(62) 37.6	7.066	0.132	(47) 37.6	(31) 26.1	7.622	0.055
30 - 39	(68) 51.1	(69) 41.8			(47) 37.6	(49) 41.2		
40 - 49	(20) 15.3	(21) 12.7			(26) 20.8	(20) 16.8		
Above 49	(8) 6.1	(13) 7.9			(5) 4.0	(19) 16.0		
Gender								
Male	(26) 19.8	(19) 11.5	3.933	0.057	(20) 15.8	(11) 9.2	0.378	0.539
Female	(106) 80.2	(146) 88.5			(105) 84.2	(108) 90.8		
Marital status								
Married	(109) 82.4	(142) 86.1	2.000	0.572	(100) 80.0	81.5	1.384	0.709
Single	(23) 17.6	(13) 7.3			20.0	10.9		
Relationship with the child								
Parent	(114) 86.3	(147) 89.1	3.879	0.275	(115) 92.0	(96) 80.7	4.656	0.097
Grandparent	(12) 9.2	(16) 9.7			(6) 4.8	(22) 18.5		
Foster parents	(6) 4.6	(2) 1.2			(4) 3.2	(1) 0.8		
Education level								
Primary and below	(85) 64.2	(119) 72.1	4.561	0.053	(66) 52.7	(81) 68.1	5.938	0.245
Secondary	(17) 13.3	(22) 13.3			(33) 26.7	(21) 17.6		
Tertiary	(30) 22.5	(24) 14.6			(26) 20.6	(17) 14.3		

Note. Chi-square tests confirm baseline equivalence between groups (all $p > 0.05$), supporting the internal validity of the cluster-randomized design.

Effect of Intervention on Parents' Engagement in Children's Learning

The aspects examined were learning activities, reading and writing, children's games, creative activities, and developing learning materials for home and school. Results in Table 2 reveal that the intervention increased parents' abilities to engage in selected learning activities. The noticeable change was observed in creative activity, which increased by 40.6% (DID = 40.6%, 95% CI [26.3%-61.9%]), creating home learning materials increased by 28.1% (DID = 28.1%, 95% CI [53.2, 6.8]), reading and writing increased by 27.2 % (DID = 27.2%, 95% CI [14.3% - 41.2%]). Overall, the intervention produced a mean DiD of 28.5 percentage points across learning activities, indicating substantial and consistent gains in parental engagement behavior in the intervention group relative to controls (Table 3).

Table 3*Effect of the Intervention on Parental Engagement in Selected Learning Activities*

Learning Activities	Control BL (132) %	Control EL (125) %	Control Difference (95% CI)	Int. BL (165) %	Int. EL (119) %	Int. Difference (95% CI)	DiD (95% CI)
Reading & Writing	54.5	60.8	6.3 (-5.8, 8.4)	43	76.5	33.5 (21.8, 45.2)	27.2 (14.3, 41.2)
Children games	16.7	28.0	11.3 (1.1, 1.5)	16.4	50.4	34 (23.1, 44.9)	22.7 (10.8, 31.8)
Creative activity	22	32.0	10 (-0.8, 20.8)	13.3	63.9	50.6 (39.4, 61.8)	40.6 (26.3, 61.9)
Developing Learning materials for home	22.7	36.8	14.1 (-2.9, 25.3)	24.2	66.4	42.2 (30.6, 53.8)	28.1(16.8, 53.2)
Developing Learning Materials for School	18.2	40.8	22.6 (11.5, 33.7)	29.1	75.6	46.5 (34.7, 58.3)	23.9 (11.7, 44.1)
Average Effect	26.8	39.7	12.9 (3.4, 23.8)	25.2	66.6	41.4 (29.9, 52.9)	28.5 (16.0, 46.4)

Note. BL = Baseline; EL = Endline; Int. = Intervention; DiD = Difference-in-Differences. All CI values reported as (lower bound, upper bound). The DiD represents the net intervention effect after accounting for secular trends in the control group.

The other aspects examined included volunteering, participating in PTA meetings, donating, cleaning activities, parent-teacher conferences, and providing pastoral programs. The results found that volunteering increased by 39.3% (DiD = 39.3%, 95%CI [17.6 - 52.1]), attending PTA meetings increased by 33.1% (DiD = 33.1%, 95% CI [21.3, 42.3]). Other ways were donations, which increased by 27.8% (DiD = 27.8%, 95% CI [16.3%, 58.1%]), and parent-teacher conferences, which increased by 25.1% (DiD = 25.1%, 95% CI [8.8%, 53.2%]) in the intervention group. Indicating that parents shifted from passive observers to active contributors. The control group showed slight declines in volunteering and donations, highlighting the counterfactual importance of the CRT design as shown in Table 4.

Table 4*Effect of Intervention on Other Factors Associated with Children's learning*

Parents activity	Control BL (132) %	Control EL (125) %	Control Difference (95% CI)	Int. BL (165) %	Int. EL (119) %	Int. Difference (95% CI)	DiD (95% CI)
Volunteering	40.9	28.8	-12.1 (-23.8, 0.4)	29.1	56.3	27.2 (15.6, 38.8)	39.3 (17.6, 52.1)
Participating in PTA meeting	44.7	48.0	3.3 (-8.9, 15.5)	43.4	79.8	36.4 (24.8, 48.0)	33.1 (21.3, 42.3)
Making donation	30.3	26.4	-3.9 (-14.9, 7.1)	23.2	47.1	23.9 (12.8, 35.0)	27.8 (16.3, 58.1)
Cleaning activities	9.1	12.8	3.7 (-3.9, 11.3)	18.7	47.1	28.4 (17.5, 39.3)	24.7 (22.6, 37.2)
Parent-Teacher Conference	13.6	38.4	24.8 (14.1, 35.5)	10.6	60.5	49.9 (38.9, 60.9)	25.1 (8.8, 53.2)
Providing Pastoral Program	8.3	11.2	2.9 (-4.3, 10.1)	6.1	30.3	24.2 (15.5, 32.9)	21.3 (13.1, 37.6)
Average Effect	24.5	27.6	3.1 (-7.0, 13.3)	21.9	53.5	31.07 (20.85, 42.48)	28.6 (16.6, 46.7)

Note. BL = Baseline; EL = Endline; Int. = Intervention; DiD = Difference-in-Differences. All CI values reported as (lower bound, upper bound). The DiD represents the net intervention effect after accounting for secular trends in the control group.

Figure 3 shows the thematic analysis results based on opportunities for parents to engage in children's learning. From the figure, it is clear that providing opportunities to engage is characterized by parents contributing to school development, making financial contributions, providing learning materials, celebrating their children's achievements, and playing a role in decision-making. One parent stated,

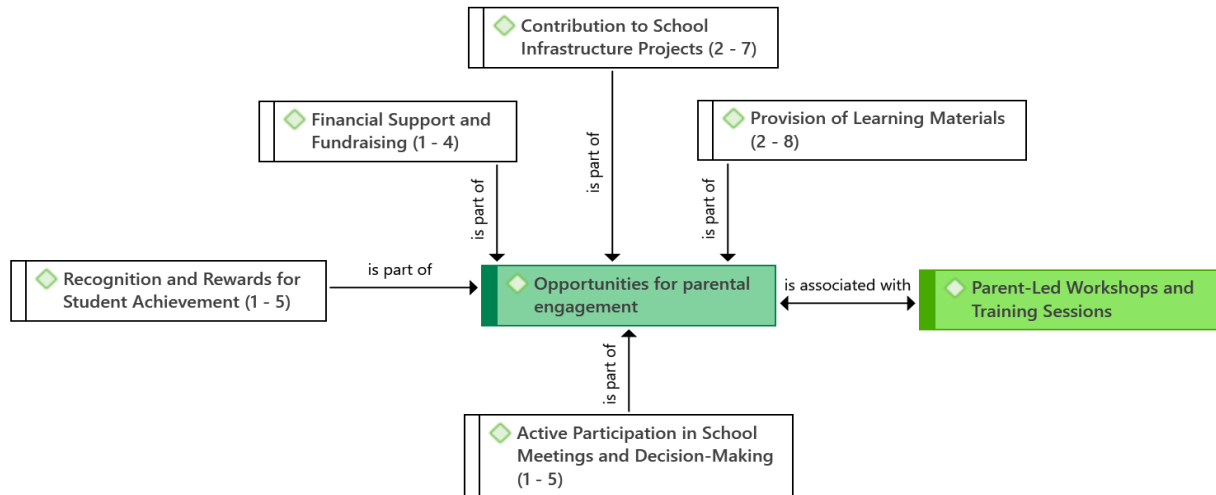
We need to leave a legacy because we are the only parents who have received this training. I propose making contributions and having cards to collect the money as PP1 parents. Whatever we get, we bring it to the office, and

maybe we can get help from there. We can start by buying materials or at least make a move. The school can assist us. We can also buy roof sheets. (Respondent 1).

The respondent added that:

If the child performs well, the teacher can invite us to contribute gifts for the children. The teacher can give the gifts to the children even if the gifts come from us. If a child comes with a plastic plate as a gift from the school for good performance, the child can be motivated. (Respondent 1).

Figure 3
Opportunities for Parents to Engage in Children's Learning



Effect of the Intervention on Parents' Capacities to Engage in Selected Learning Activities

These findings are based on the self-reported perceptions of the parents regarding their empowerment and skill levels across the respective domains, apart from the proportions of behavioral engagement as presented in Table 4. The average difference-in-differences figure of 17.2 percentage points indicates a notable improvement in the parental capacity levels, with the highest increases recorded in creative activities (29.4%) and supporting child well-being (27.2%). It must be noted that the DiD figure of 20.6% recorded in the case of reading and writing capacity levels is lower than the respective behavioral engagement figure of 27.2% as presented in Table 5.

Table 5
Parents Capacity to Engage in Learning Activities

Learning activities	Control BL (132) %	Control EL (125) %	Control Difference (95% CI)	Int. BL (165) %	Int. EL (119) %	Int. Difference (95% CI)	DiD (95% CI)
Reading & Writing	50.0	71.20	21.2 (9.2, 33.2)	43.9	85.7	41.8 (30.3, 53.3)	20.6 (16.3, 24.6)
Creative Activity	35.6	63.20	27.6 (15.4, 39.8)	33.8	90.8	57.0 (45.4, 68.6)	29.4 (16.1, 40.4)
Sport & Games	28.0	61.60	33.6 (21.4, 45.8)	28.8	77.3	48.5 (36.7, 60.3)	14.9 (7.9, 22.8)
Develop learning materials	36.4	66.40	30 (17.8, 42.2)	47.5	89.9	42.4 (31.2, 53.6)	12.4 (5.1, 19.4)
Child-wellbeing	22.7	33.6	10.9 (-0.1, 21.9)	23.2	61.3	38.1 (26.6, 49.6)	27.2 (19.4, 34.6)
Average Effect	43.18	69.12	25.9 (13.8, 38.1)	44.74	87.90	43.16 (31.8, 54.6)	17.22 (6.9, 32.5)

Note. BL = Baseline; EL = Endline; Int. = Intervention; DiD = Difference-in-Differences. All CI values reported as (lower bound, upper bound). The DiD represents the net intervention effect after accounting for secular trends in the control group.

Results in Figure 2 further show that when parents are provided opportunities to develop their capacities through training, they become more empowered and can engage more meaningfully. The verbatim responses demonstrate that the training had strengthened their commitment and the degree to which they collaborated with teachers in learning activities. One respondent highlighted,

As a parent, I have learnt that I as a parent need to be committed when dealing with my child. Whatever my child needs, I should be preparing the child. For example, if it's clothes, I should maintain the cleanliness of my child. Preparing the child in the morning instead of just telling the child to go dress by herself and go to school. So, I have come to realize that I should be committed to waking up in the morning, preparing the child to an extent of escorting the child to school so that the child can get an education and be happy as the child attends the school and be happy being with the teacher. I have also learned to love the teacher so that my child can benefit (Respondent 1).

Further, training increased parental involvement in children's academic lives, with a strong focus on academic support within the family setting, and parents shared experiences of improving morning routines and discipline and ensuring punctuality and preparation for school. One respondent said,

I have observed the improvement in the desire to know more about what the child studied at school. For example, in the song we just sang, you become happy and clap for the child. At least the child becomes motivated (Respondent 5).

Effect of Intervention on Strengthening Communication Between Parents and Teachers

To determine if there was a difference in communication between parents and teachers, we examined the frequency of communication. The respondents indicated how frequently the specific activities were communicated. The average DiD of 35.6 percentage points indicates that the intervention had a significant impact on communication between parents and teachers. The most significant impacts were on classwork (DiD=43.0%) and academic progress (DiD=42.5%), suggesting that the communication protocols introduced in Session 2 had a significant impact. The values of the lower confidence interval are all greater than zero, suggesting that the impacts are statistically significant in all communication domains as shown in Table 6.

Table 6
Communication Between Teachers and Parents

Issues communicated	Control BL (132) %	Control EL (125) %	Control Difference (95% CI)	Int. BL (165) %	Int. EL (119) %	Int. Difference (95% CI)	DiD (95% CI)
Academic Progress	50.0	56.0	6 (-6.2, 18.2)	36.4	84.9	48.5 (36.8, 60.2)	42.5 (22.6, 53.6)
Classwork	40.2	53.6	13.4 (1.2, 25.6)	29.3	85.7	56.4 (44.6, 68.2)	43.0 (26.3, 60.1)
Creative activity	25.0	28.8	3.8 (-7.0, 14.6)	15.2	49.6	34.4 (23.6, 45.2)	30.6 (14.8, 53.2)
Socio-emotional well-being	37.9	48.8	10.9 (-1.2, 23.0)	31.3	78.2	46.9 (35.1, 58.7)	36 (19.5, 44.6)
Special learning needs	19.7	38.4	18.7 (7.6, 29.8)	14.1	58.8	44.7 (33.6, 55.8)	26 (17.4, 35.2)
Average Effect on Communication	30.90	38.8	7.9 (-3.8, 19.5)	24.47	58.28	33.8 (22.3, 45.3)	26.0 (20.1, 32.2)

Note. BL = Baseline; EL = Endline; Int. = Intervention; DiD = Difference-in-Differences. All CI values reported as (lower bound, upper bound). The DiD represents the net intervention effect after accounting for secular trends in the control group.

Continuous and effective communication was vital in helping parents engage with their children's learning. Parents stated the importance of honest and open communication, with most affirming that

I have learned to visit my child's teacher and talk to her to have an agreement." (Respondent 1). Another one stated, "I have learned about the benefits of communication. It is essential to observe the area of weakness. I was busy with my activities. I did not know that it was important to build a good relationship with the teacher (Respondent 4).

Effect of Intervention in Creating a Supportive School Environment that Promotes Children's Learning

The results in Table 7 showed that most parents agreed that the school culture and environment are critical in enhancing parental engagement at the baseline in both the control and intervention groups, with proportions ranging from 58% to 96%. However, in the intervention, a huge effect was observed on parents' satisfaction regarding relation they had with the schools at 25% difference (DiD = 25, 95% CI [17.4, 32.1]), school helping parents to know what their children are learning 20.3% difference (DiD = 20.3, 95% CI [13.4, 26.8]), and the teacher providing a practical guide on assisting children study at home 20.9% (DiD = 20.9, 95% CI [9.3, 32.9]) shown in Table 6. The mean DiD for school environment items is 10.1 percentage points, which is lower than that for behavioral engagement outcomes. This was expected because of the high

baseline scores (79-96%) for these outcomes, suggesting ceiling effects. The three items showing the strongest effect are satisfaction with relationships in school (25.0%), provision by teacher of home study guides (20.9%), and support for learning in school (20.3%). These are directly related to intervention content and thus support relevance. The item 'head teacher supportive of my role' had a non-significant negative effect (-6.1%), which could be because of disruption of routine during this period.

Table 7

School Environment and Culture that Supports Parental Engagement

School Environment /Culture	Control BL (132) %	Control EL (125) %	Control Difference (95% CI)	Int. BL (165) %	Int. EL (119) %	Int. Difference (95% CI)	DID (95% CI)
School cares about helping me understand what my child is learning	72.0	77.60	5.6 (-5.0, 16.2)	65.7	91.6	25.9 (15.9, 35.9)	20.3 (13.4, 26.8)
Teachers work closely with me to meet my child's learning needs.	80.3	82.40	2.1 (-7.4, 11.6)	76.3	92.4	16.1 (7.3, 24.9)	14 (8.1, 19.6)
The teacher provides a practical guide on assisting children in studying at home.	58.3	71.20	12.9 (1.2, 24.6)	60.1	93.9	33.8 (23.5, 44.1)	20.9 (9.3, 32.9)
I am warmly received by the school when I inquire about my child.	95.9	91.60	-4.3 (-10.2, 1.6)	95.5	98.3	2.8 (-1.4, 7.0)	7.1 (-12.2, 3.6)
School staff build trust with me.	82.6	87.20	4.6 (-4.2, 13.4)	86.4	99.2	12.8 (6.3, 19.3)	8.2 (2.5, 14.6)
The head teacher is very supportive of my role in the school.	84.4	88.00	3.6 (-4.8, 12.0)	89.9	87.4	-2.5 (-9.9, 4.9)	-6.1 (-13.7, 2.3)
The school encourages feedback from parents and the community.	77.3	84.80	7.5 (-2.1, 17.1)	81.8	93.3	11.5 (3.5, 19.5)	4 (2.8, 6.6)
The school has a culture/ tradition that supports me to engage.	84.1	80.80	-3.3 (-12.6, 6.0)	84.8	89.9	5.1 (-2.8, 13.0)	8.4 (3.3, 14.9)
I trust my child's school.	77.3	67.20	-10.1 (-21.0, 0.8)	77.3	84.9	7.6 (-1.7, 16.9)	17.7 (-5.6, 30.1)
The school provides adequate opportunities for parents to engage.	79.8	92.40	12.6 (4.1, 21.1)	83.8	96.6	12.8 (5.5, 20.1)	0.2 (-2.3, 1.3)
I am satisfied with the relationship I have with my child's school.	72.7	68.00	-4.7 (-15.9, 6.5)	74.7	95	20.3 (11.5, 29.1)	25 (17.4, 32.1)
I am satisfied with the mode of communication in my child's school.	87.1	88.00	0.9 (-7.2, 9.0)	85.4	96.6	11.2 (4.2, 18.2)	10.3 (6.6, 14.4)
Average Effect DID on School Culture	79.51	82.46	3.0 (-6.7, 12.6)	80.70	93.72	13.0 (4.9, 21.2)	10.06 (6.7, 15.8)

Note. BL = Baseline; EL = Endline; Int. = Intervention; DiD = Difference-in-Differences. All CI values reported as (lower bound, upper bound). The DiD represents the net intervention effect after accounting for secular trends in the control group.

Parents Initiated Projects

After the training sessions, parents in the 12 schools that completed the interventions brainstormed and agreed on their winning projects. This was the most inspiring part of the project. Below is a table of the parents' ongoing projects (Table 8).

Table 8*Parent Initiated Projects*

School	Activities	Resource Mobilisation
School A	Repair PP1 classroom floor and blackboard	Parents' donations in kind
School B/C	Buy a mattress for children to sleep	
School D	Renovation of the floor, installation of doors and windows	
School E	Purchase a metallic cupboard for storing children's books and bags.	
School F	Fix a swing for children.	
School G/H	Set up a feeding program.	
School I	Build a toilet for the children	
School J	Painting a PP1 Classroom	
School K/L	Renovation of classrooms	

Discussion

The results on the effects of the intervention on parents' engagement in children's learning activities support the transformative impact of parental engagement on children's learning and development. The intervention substantially increased parental participation in learning activities, particularly in creative engagement, reading, and development of learning materials. The substantial positive impact of the intervention is evident in the significant differences observed between the intervention and control groups. Among the various learning activities, the most remarkable improvement was seen in creative activities, where participation increased by 40.6%. The significant increase in creative activities demonstrates that when parents are made aware of effective engagement strategies, they are more likely to foster enriching learning environments at home. Additionally, the notable improvements in creating home learning materials (28.1%) and reading and writing activities (27.2%) indicate that parents, when provided with proper resources and support, are both willing and capable of enhancing their children's educational experiences. These findings align with existing literature which emphasize on the importance of parental engagement in fostering holistic child development (Akpuokwe et al., 2024; Chrispeels & Rivero, 2001; Ihmeideh et al., 2020; Jasis, 2021; Kelty & Wakabayashi, 2020; Kingston, 2021; Tan et al., 2020; Thelma et al., 2024). This is explained by the fact that building parental capacity strengthens the home-school connection, making learning a shared responsibility between educators and families (Goodall & Montgomery, 2014). Furthermore, the study highlights the crucial role of educators in facilitating parental involvement. Teachers who actively engage parents by designing structured learning activities foster greater collaboration between home and school. Such an approach not only provides support for learning but also strengthens the broader community by promoting shared accountability and partnership in education (Darling-Hammond & Cook-Harvey, 2018).

On the other hand, the intervention significantly enhanced parental and community engagement in school activities, as shown in table 3. There was notable improvement in participation in PTA meetings (39.3%), volunteering (39.3%), parent-teacher conferences (25.1%) and cleaning activities (24.7%). Results from the interviews showed that parents not only increased their physical participation but also contributed financially to school development. One respondent emphasized the importance of parental contributions, proposing a system for financial support to improve school infrastructure (Respondent 1). These results suggest that beyond increasing participation, the intervention shifted parental engagement from passive involvement to active investment in student success and school development, reinforcing shared responsibility in education as supported by literature (Brown et al., 2022; Gibbons & Connolly, 2021; Rall, 2021). Structured educational interventions play a critical role in fostering engagement, with studies showing that parental participation in school activities improves student performance, behavior, and motivation as well as improved school environments (Axford et al., 2019; Chrispeels & Rivero, 2001; Raftery et al., 2012). Furthermore, such interventions strengthen school-community relationships, creating a more inclusive and supportive learning environment (Jacques & Villegas, 2018).

The results on the effect of the intervention on parents' capacities to engage in selected learning

activities indicate that the intervention significantly enhanced parental engagement in children's learning activities, as reflected in the DID values across various domains. The most notable improvement was in creative activities, where participation increased by 57.0% in the intervention group compared to 27.6% in the control group, resulting in an intervention effect of 29.4 %. Similarly, reading and writing activities increased by 20.6% while participation in sports and games improved by 14.9%. Child well-being, which includes emotional and physical support from parents, also demonstrated a strong intervention effect (27.2%). These findings align with existing research suggesting that structured training programs enhance parental involvement, leading to better educational outcomes for children (Jasis, 2021; Keller et al., 2021; Kelty & Wakabayashi, 2020; Thelma et al., 2024). Results from the qualitative data sheds light on how training empowers parents to take a more active role in their children's education. Respondents reported a stronger commitment to supporting their children's learning, with one parent emphasizing the importance of preparing children for school, ensuring they are clean, well-dressed, and emotionally supported (Respondent 1). Another parent highlighted a newfound joy in engaging with their child's academic activities, celebrating small achievements such as clapping along with their songs (Respondent 5). These narratives align with the observed improvements in child well-being (27.2%) and the development of learning materials (12.4%), demonstrating that beyond increasing parental participation, the intervention fostered a cultural shift in parenting practices as supported by the literature (Barblett et al., 2020; Hands, 2013; Rossetti et al., 2020; Sianturi et al., 2022). Hill and Tyson (2009) emphasize that parental involvement is crucial for student development and that training can enhance parents' understanding of how to support their children effectively.

The results on the effect of intervention on strengthening communication between parents and teachers indicate that the intervention significantly improved parent-teacher communication, leading to increased frequency and depth of discussions on key aspects of student learning. The most notable improvement was in communication about classwork, where the intervention group showed a 56.4% increase, resulting in an intervention effect of 43.0%. Similarly, discussions on academic progress improved by 42.5%, indicating a substantial rise in parental awareness of their children's learning. Other critical areas, such as socio-emotional well-being and special learning needs also experienced notable intervention effects. Results from the interviews further reinforces these findings, illustrating how improved communication strengthened parental engagement. One respondent stressed the importance of regularly visiting teachers to establish agreements on their child's education (Respondent 1). Another reflected on how the training helped them recognize the value of communication in identifying their child's learning challenges, acknowledging that prior to the intervention, other responsibilities had prevented them from prioritizing teacher interactions (Respondent 4). These perspectives align with the observed improvements in learning-related engagement suggesting that enhanced communication empowered parents to take a more proactive role in their children's education. Studies have emphasized the importance of parent-teacher communication in supporting student learning, as strong home-school relationships are associated with positive engagement and learning-related experiences (Barblett et al., 2020; Fretwell et al., 2018; Lin & Yang, 2025; Mertala, 2019; Rentzou & Ekine, 2017; Rossetti et al., 2020; Vongsachang et al., 2020). Again, clear and collaborative communication between schools and families enhances the home-school relationship, creating a more inclusive educational environment (Eden et al., 2024).

The results in table 6 showed that most parents agreed that the school culture and environment are critical in enhancing parental engagement at the baseline in both the control and intervention groups, with proportions ranging from 58% to 96%. However, in the intervention, a huge effect was observed on parents' satisfaction regarding relation they had with the schools at 25% difference (DID = 25, 95% CI [17.4, 32.1]), school helping parents to know what their children are learning 20.3% difference (DID = 20.3, 95% CI [13.4, 26.8]), and the teacher providing a practical guide on assisting children study at home 20.9% (DID = 20.9, 95% CI [9.3, 32.9]). These results demonstrate that creating a supportive school environment where parents feel valued partners in their children's education promotes good relationships and can translate into long-term benefits to their children's learning and holistic development (Darling-Hammond & Cook-Harvey, 2018).

On the parents initiated projects, the intervention empowered parents to contribute to school development through various improvement projects across 12 schools. Using in-kind donations, parents undertook infrastructure upgrades such as classroom renovations, welfare initiatives like a feeding program, and enhancing learning spaces with storage cupboards. These efforts reflect a strong sense of ownership and collaboration, aligning with research that highlights the role of parental involvement in fostering sustainable school improvements and strengthening school-community relationships (Axford et al., 2019; Barblett et al., 2020; Gonzalez-Dehass et al., 2005). The intervention also facilitated parent networking, enabling them to connect, share experiences, support one another, and stay informed about school matters. Establishing strong parent networks is crucial in fostering engagement, as it provides opportunities for collaboration and collective problem-solving (Goodall & Montgomery, 2014; Shepherd et al., 2020). Initially, many parents were unfamiliar with one another, but the program fostered a sense of community through support groups, participation in school decision-making, and parent-led initiatives. A key outcome was the development of joint projects within intervention groups, where parents mobilized resources collaboratively. This structured approach proved essential to the intervention's success, reinforcing the importance of collective engagement in school improvement efforts.

The emergence of parent-initiated projects provides important insights into the sustainability of the intervention's outcomes. These initiatives suggest that parental engagement extended beyond structured training into self-driven action, indicating the development of ownership and intrinsic motivation among parents. Such locally initiated practices are more likely to be sustained over time, particularly when they are embedded within existing school structures such as parent associations or routine school activities. However, sustaining these efforts may present challenges, including variations in parental commitment, leadership continuity within parent groups, and economic constraints that limit parents' time and resources. Scaling these practices across other contexts will therefore require institutional support from schools and education authorities, including formal mechanisms for coordination, ongoing capacity-building, and integration into policy frameworks to ensure continuity and broader impact.

This study draws on Epstein's framework of six types of parental involvement, and the findings demonstrate how the PE&E intervention strengthened key domains of parental engagement. First, parenting was enhanced through structured training sessions that equipped parents with knowledge on child development, daily routines, and supportive home practices, as reflected in improved child well-being and home preparation. Second, communication showed one of the most significant gains, with substantial increases in discussions on classwork, academic progress, and socio-emotional development, indicating that the intervention successfully strengthened home-school information flow. Third, learning at home emerged as the domain with the greatest improvement, evidenced by large increases in reading and writing activities, creative engagement, and the development of home learning materials. This effect is likely because the intervention provided practical, low-cost strategies that parents could immediately apply within their home environments. Fourth, volunteering improved considerably, with increased participation in PTA meetings, school activities, and classroom support, demonstrating a shift from passive to active parental involvement. Fifth, decision-making was reflected in parents' increased participation in school-related discussions and their involvement in planning and implementing school improvement initiatives. Finally, collaboration with the community was evident through parent-initiated projects such as classroom renovations, feeding programs, and resource mobilization efforts, highlighting the development of collective agency among parents. Among these domains, learning at home, communication, and community collaboration showed the greatest improvements. This may be attributed to the intervention's emphasis on practical engagement strategies, continuous interaction with teachers, and group-based activities that fostered peer support and collective action. In contrast, domains such as decision-making and institutional integration may require longer-term structural changes within schools to achieve equally strong effects. Overall, the findings demonstrate that interventions aligned with Epstein's framework can effectively strengthen multiple dimensions of parental involvement, particularly when they combine skill-building, relationship-building, and community mobilization approaches.

Limitations

This study had several limitations. First, the short-term nature of the intervention limits the ability to assess its long-term impact on parental involvement, and sustained home–school communication over time. While the study measured improvements in parental engagement and learning support practices, the longer-term effects of these interventions on children’s educational trajectories remain unclear. Additionally, the reduction in the number of participants from baseline to endline may have introduced attrition bias. The reliance on self-reported data for measuring parental engagement also presents potential biases, as parents may have over- or under-reported their levels of involvement. To address this limitation, the quantitative survey findings were triangulated with qualitative interviews conducted with parents, providing additional context and supporting the validity of the results. Another limitation is the variation in evaluator teams between baseline and endline assessments, which may have caused some inconsistency in data collection. Finally, the study focused on a single rural region, which may limit the generalizability of the findings to other contexts or urban settings.

Implications for Early Childhood Education and Care (ECEC) Policy and Practice

The findings of this study emphasize the critical role of parental empowerment in enhancing foundational learning outcomes and highlight the need to embed structured PE&E approaches within Kenya’s ECDE policy frameworks. Specifically, the PE&E model can be institutionalized by aligning it with the current Ministry of Education parental engagement guidelines, ensuring that parental involvement is systematically integrated into ECDE programming. At the practice level, there is a need to incorporate structured parent engagement modules into both pre- and in-service teacher training programs to equip teachers with the skills to effectively collaborate with parents. Furthermore, strengthening community-level engagement through the establishment of parent support groups, peer learning forums, and school-community partnerships can enhance sustainability and collective responsibility for children’s learning. Given its demonstrated effectiveness and relatively low implementation cost, the PE&E intervention presents a scalable model that can be adapted and expanded to other rural and marginalized settings, contributing to improved learner retention, progression, and overall educational equity.

Conclusion

This study provides evidence of the impact of parental empowerment on early childhood education, particularly in marginalized areas like Mbeere, Embu County, Kenya. The Parental Empowerment and Engagement intervention showed that equipping parents with tools, knowledge, and support significantly improves children’s learning outcomes through increased involvement in creative activities, home learning, and communication with teachers. Parents also initiated community projects like classroom renovations and feeding programs, reflecting their growing commitment to improving educational infrastructure. These findings highlight the critical role of empowering parents in enhancing student success, fostering school-community collaboration, and addressing educational inequalities. Integrating parental empowerment into education policies can bridge foundational learning gaps and promote equity in underserved areas. Training teachers to engage parents effectively is essential for sustaining these gains. The intervention also shows potential for adaptation in similar contexts.

Declarations

Authors’ Declarations

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