



# **Analysis of Correlation between In-service Training and Academic Achievement of Pupils in Public Primary Schools in Kenya**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. Author JOM designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors JOM and OOM managed the analyses of the study. Author AOJ managed the literature searches. All authors read and approved the final manuscript.*

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## **ABSTRACT**

In-service teacher education has been used as a tool for capacity building world over and in Kenya. Despite the perceived importance of continuing in-service training for teachers in updating their professional knowledge, its provision was inadequate in Kenya. It is within this context that this study examined the extent to which the in-service training was being provided and how it predicted the academic achievement of pupils in Kenya with specific reference to Teso North sub-county. This research adopted a descriptive survey research design of ex-post-facto type. Stratified random sampling technique was used to select 272 respondents (55 deputy headteachers and 217 teachers). Two research questions and one hypothesis guided the study. Structured questionnaire and document analysis were instruments of data collection. The data were analyzed using descriptive statistics of mean and standard deviations and inferential statistics of Chi-Square, independent T-Test and linear regression. The hypothesis was tested at 0.05 level of significance. The findings revealed that the extent of the provision of in-service training in the sub-county was low. The hypothesis testing through the Chi-Square indicated that there was a significant

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relationship between the provision of in-service training and academic achievement of pupils ( $\chi^2=200.14$ ,  $p = 0.0000$ ). Linear regression analysis revealed that the influence of in-service training on academic achievement was significant ( $R = 0.898$ ,  $p < 0.05$ ). Therefore, the study recommends that the Ministry of Education should formulate in-service training policy for the teachers and the training should be structured and closely aligned with the acquisition of skills and knowledge gaps.

*Keywords: In-service training; academic achievement; primary schools.*

## 1. INTRODUCTION

According to Asiyai, [1] in-service training is the process of continuously updating teachers' knowledge, skills and interests in the chosen field. This definition is in agreement with Oduwusi, [2] who perceives in-service training as a planned and systematic modification of behaviour through learning events, activities and programmes which results in participants achieving the higher levels of knowledge, skills, competences and abilities to carry out their work. Taking this definition further, Garavan [3] defines training as a process of bridging the gap between the current performance and the standard desired performance by sharpening of skills, concepts, changing attitude and gaining of more knowledge to enhance the performance of employees in an organization. Nevertheless, for the purpose of this study, the definition of in-service training is derived from [4] who regards in-service training as a learning activity directed towards the acquisition of specific knowledge, skills, values, right attitudes and the potential needed for academic excellence of learners. Cohen & Hill, [5] emphasize that in-service training helps teachers acquire more conceptual and technical knowledge, skills and competencies in their teaching subjects and pedagogy in order to improve their efficiency in the classroom. Tan, [6] goes on to expound that in-service training is the process and activities designed to enhance the professional content subject matter, knowledge, skills and attitudes of teachers so as to improve the learning outcome of learners.

Therefore, the importance of in-service training in the development of human resource in an organization in modern times cannot be overemphasized. Several studies have indicated that improving the standards of pre-service training of teachers cannot lessen the continuous in-service training because teachers like doctors and lawyers must continue with their education even after graduation. As such in-service training is meant for professional upgrading which deals

with all developmental functions directed at maintenance and enhancement of their professional competencies [7]. Hence, in-service training of teachers plays an indispensable role in improving the quality of teaching. In-service training plays a key role in changing the teachers' pedagogical skills, knowledge and attitudes which in turn has a significant impact on pupils learning outcomes [8].

In Ghana, although the proportion of teachers who had never attended in-service training was less compared to those who had attended, this number was still significant. This indicated that the Ghana Education Service was not giving all the proper and needed attention to the in-service training of teachers [9]. This study also indicated that the inset was not organized regularly despite the fact that the in-service training was significant in enhancing the performance of teachers and thus improved learners' academic performance. Moreover, a study conducted by Ajani et al. [10] on the needs for in-service professional development of teachers to improve students' academic performance in sub-Saharan Africa with specific reference to Nigeria, revealed that relevant, very objective and well designed in-service training of teachers promoted effective institutional tasks delivery of teachers which lead to better academic performance in internal and external examinations. Therefore, the in-service training of teachers is important to quality education as it equips the teachers with the current and effective knowledge, skills, values and attitudes that promote academic excellence in the teaching and learning in the school system. However, in spite of the evidence that provision of in-service training improved teaching skills of participating teachers and ensured the better academic performance of learners, Provision of in-service training to all teachers was a challenge in Nigeria as the only limited number of teachers could access it. Many teachers lacked the opportunity to participate in the in-service training and those who participated were not frequently trained [4,10].

Despite the fact that the millennium development goal of universal primary education has been largely achieved in Kenya, educational quality as measured by the learners' outcome has remained stagnant. Kenya has had a gross primary enrolment ratio well above 100% for the last decade but literacy outcomes of learners at the primary level have remained low. Outdated and ineffective pedagogy has been cited as one of the central reasons for the low learning outcomes [11,12]. Given that teachers in Kenya have limited in-service training, these findings are not surprising as the Kenyan government has repeatedly declared its initiative to improve instructional quality by increasing focus on in-service training of teachers. In practice, however, in-service training was a rare occurrence for most teachers [8]. Therefore, in this context where teachers are ill-prepared for their roles, effective in-service training of teachers may help improve learning outcomes in a sustainable way [13]. This calls for the examination of the extent of provision of in-service training and its relationship with academic achievement of learners primary schools in Kenya in general and Teso North sub-county in particular.

## 2. METHODOLOGY

### 2.1 Research Design

The study adopted a descriptive research design of the ex-post facto type. This was considered appropriate for the study because the researcher did not manipulate any of the variables in the study [14,15].

### 2.2 Study Population

The study population was composed of 58 deputy headteachers and 436 teachers drawn from 58 public primary schools giving a total of 494 respondents.

### 2.3 Sampling Technique and Sample Size

Stratified sampling technique was used to select deputy headteachers and teachers from public primary schools. Stratified sampling technique was employed here because the researcher intended to obtain a representative sample that would result in more detailed and reliable information [16] from both female and male respondents. Therefore, the sample for the study consisted of 35 male deputy headteachers, 20 female deputy headteachers, 57 male teachers

and 160 female teachers giving a total of 272 respondents.

### 2.4 Area of Study

The study was conducted in Teso North Sub-county which was purposively sampled due to low level of learning outcomes compared to other sub-counties nationally.

### 2.5 Research Instruments

The study used a structured questionnaire and document analysis as instruments of data collection. A close-ended questionnaire was constructed to elicit responses from deputy head teachers and teachers.

## 3. RESULTS AND DISCUSSION

The quantitative data were analyzed using descriptive statistics of means and standard deviations and inferential statistics of Chi-square, independent T-Test and linear regression. Means and standard deviations were used to assess the extent of the provision of in-service training. Chi-square was used to measure the degree of relationship between the in-service training and academic achievement of pupils in primary schools while an independent t-test statistic was conducted to establish if there was any significant difference of perceptions of the extent of implementation of in-service training between teachers and deputy's headteachers. Linear regression analysis was employed to establish the influence of implementation of in-service training on the academic achievement of pupils. The data gathered by the structured questionnaires were complemented and amplified with document analysis.

### 3.1 Research Hypotheses

**H<sub>0</sub>:** There is no significant relationship between in-service training and academic achievement of pupils in Teso North sub-county.

**H<sub>1</sub>:** There is a significant relationship between in-service training and academic achievement of pupils in Teso North sub-county.

This hypothesis was tested at the 0.05 alpha level using Chi-square. The descriptive statistic Table 1 describes the distribution of teachers who had either attended or not attended the in-service training between the years 2011 and 2018.

**Table 1. Teachers' responses on attendance of in-service training between 2011 and 2018**

In-service training	No of teachers	Percentage (%)
Attended In-service Training (2011-2018)	90	33.1
Not Attended In-service Training (2011-2018)	182	66.9
	<b>272</b>	<b>100</b>

The information in Table 1 reveals that a larger proportion, 182 (66.9%), had not attended the in-service training between the years 2011 and 2018. Only 90 (33.1%) of the research participants had attended the in-service training within the specified period of time. Therefore, it can be inferred from this finding that the provision of in-service training was but limited. This finding is consistent with the findings of [10] who found that one of the prominent challenges in the provision of in-service training was the limited number of teachers that could access the in-service training. Moreover, many teachers were not the opportunity to participate and those who participated were not frequently trained. Echoing a similar perception, [17] pointed out that the current national education plan in Kenya had no national system for in-service training and most of the primary school teachers had no access to further training after starting work as teachers. This implies that efforts have to be made to implement a systematic, effective and sustainable in-service training for the teachers in the sub-county in particular and Kenya in general.

Thus the provision of regular in-service training in the sub-county was undermined. [18] argues that since entering a teaching profession entails a commitment to becoming a student in one's area, the pre-training must be regarded as the first phase in the lifelong pursuit of well informed up to date competent service in that area. The pre-training should, therefore, be thought of and planned as the first phase of a professional development continuum that will span the entire working lives of teachers. However, the notion of in-service training as a continuum poses a major challenge for policymakers and teacher education in Kenyan context wherein the absence of a clear and specific policy framework, the in-service training operate largely in isolation [17,19].

However, the data presented in Table 2 show the responses of teachers pertaining to whether the

mean scores of the schools in the study locale had been either above average or below average in the specified period of time.

**Table 2. Teachers' responses on academic achievement in KCPE between 2011 and 2018**

Mean scores	No of teachers	Percentage (%)
Mean Scores above Average (Above 250 marks)	109	40.1
Mean Score Below Average (Below 250 marks)	163	59.9
	<b>272</b>	<b>100</b>

Based on the data shown in Table 2, 109 (40.1%) and 163(59.9%) of the teachers were of the opinion that the mean scores were above average and below average respectively. The data in Table 1 and Table 2 were the hypothetical data used to compute the Chi-Square using SPSS version 20. Hence Table 3 shows the results of the Chi-Square tests.

**Table 3. Chi-square tests**

	Value	df	Asymp. Sig (2-sided)
Pearson Chi-Square	201.141 <sup>a</sup>	1	.000
Likelihood Ratio	244.473	1	.000
Linear-by-Linear Association	200.402	1	.000
N of Valid Cases	272		

a. 0 cells (.0 %) have expected count less than 5. The minimum expected count is 36.07

The results in Table 3 show that the Pearson Chi-Square statistic,  $\chi^2 = 200.14$  and  $p = 0.000$  is less than the alpha level of significance of 0.05. The null hypothesis is rejected since  $p < 0.05$ . The alternative hypothesis that there is a significant relationship between in-service training and academic achievement of pupils in Teso North sub-county is supported by this analysis. The finding of this study is in agreement with that of [20] who conducted a study on the impact of training on organizational performance in Malaysia. The research found that there was a statistically significant positive relationship between training and organizational performance ( $r = .330$ ;  $p < .01$ ).

### 3.2 Research Question One

To what extent has the in-service training of teachers been implemented in primary schools in Teso North sub-county?

Means and standard deviations were used to assess the extent of implementation of in-service training. Seven items on a 5-point Likert scale were used to measure the extent of implementation of in-service training where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree. In order to reduce the bulk of data in analysis and interpretation, the items were coded as illustrated in Table 4 that follows.

Therefore, Table 5 reports the mean score value ratings and standard deviations of the responses of teachers and deputy headteachers regarding the extent of the provision of in-service training. In order to assess the extent of provision of in-service training, an interval class was developed as follows (1) Very Low: 1.00 to 1.80 (2) Low: 1.81 to 2.60 (3) Moderate: 2.61 to 3.40 (4) High: 3.41 to 4.20 (5) Very High: 4.21 to 5.00. The findings in Table 5 show that the cluster means score values were 2.46 and 2.45 according to teachers' and deputy headteachers' responses respectively. This indicates that the extent of implementation of in-service training was low in primary schools in the sub-county according to Table 5. Further, based on the results on Table 5, items 1,2,3, 5, and 7 had mean score values ranging from 1.93 to 2.59 with standard deviations ranging from 0.38 to 1.28 respectively according to teachers' and deputy headteachers' perceptions. These mean score values fall within the range of 1.81 to 2.60 according to Table 5 which implied that to a low extent schools as organizations always strove to develop skills and abilities of teachers in order to improve academic performance of learners, there was regular in-service training of teachers to improve their teaching skills, in-service training objectives were in schools which corresponded to the academic achievement of pupils, the in-service training was a continuous process for all teaching staff and that there was emphasis on in-service training of teachers in the schools to improve the teaching skills of teachers to enhance the academic achievement of the pupils.

However, item 4 had means scores of 2.61 and 2.55 with standard deviations of 0.98 and 1.49 respectively according to teachers' and deputy headteachers' opinions. The mean score value according to the responses of teachers fell within the range of 2.61 to 3.40. This indicates that to a moderate extent, the level of in-service training in the schools ensured that the skills and attitudes attained by teachers enhanced continuous improvement in the academic achievement of

pupils. Furthermore, the mean score value of 2.55 according to the responses of deputy headteachers fell within the range of 1.81 to 2.60 indicating that to a low extent, the level of in-service training in the schools ensured that the skills and attitudes attained by teachers enhanced continuous improvement in the academic achievement of pupils.

Nevertheless, item 6 registered mean score values of 3.52 and 3.59 according to the responses of teachers and deputy's headteachers respectively. This implies that to a high extent, in-service training was essential for both the headteachers and the teaching staff. However, the cluster standard deviations of 0.89 and 1.08 according to the teachers' and deputy headteachers' responses respectively revealed that there was high variability in the extent of provision of in-service training among the primary schools in the sub-county.

An independent sample T-test analysis was conducted to establish if there was any significant difference in opinions on the extent of provision of in-service training between teachers and deputy's headteachers. The results of the independent sample T-test statistics under the assumption of equal variance were summarized and presented in Table 6.

From the Table 6, there was statistically no significant difference between teachers (Mean = 2.46; Std = 1.07) and deputy headteachers (Mean = 2.45; Std = 1.23) opinions regarding the extent of implementation of in-service training in;  $t(270) = 0.048, p = 0.961$ . The findings of this study illustrate that the extent of the provision of in-service training was low in primary schools as viewed by both teachers and deputy headteachers.

### 3.3 Research Question Two

To what extent does the implementation of in-service training influence the academic achievement of pupils in Teso North sub-county? Linear regression analysis was conducted to establish the predictive relationship between the extent of implementation of in-service training and academic achievement of pupils. Table 7 presents a model summary of the regression results.

From Table 7, in-service training correlated positively and significantly with the academic achievement of pupils ( $R = .898, p < .05$ ). The  $R^2$

value of .807 means that 80.7% of the total variance of academic performance of pupils was accounted for by in-service training while 19.3% was due to other factors and residuals. However, to test for the significance of the R-value Table 8 was presented.

**Table 4. In-service training**

Code	Item
TR1	This school as an organization always strives to develop the skills and abilities of teachers in order to improve the academic performance of pupils
TR2	In this school, there is regular in-service training of teachers to improve their teaching skills
TR3	There are in-service training objectives in this school which corresponds to the academic achievement of pupils
TR4	The level of in-service training in this school ensures that the skills and attitudes attained by teachers enhance continuous improvement in the academic achievement of learners
TR5	In this school, in-service training is a continuous process for all teaching staff
TR6	In this school, in-service training is essential for both the headteacher and the teaching staff
TR7	There is an emphasis on in-service training of teachers in this school to improve their teaching skills to enhance the academic achievement of the learners

Key: TR = TRAINING

**Table 5. Mean ratings and standard deviations of responses of teachers and deputy head teachers on extent of implementation of in-service training**

Item	Respondent	Number of respondents	Mean	Standard deviation
TR1	Teacher	223	2.47	0.94
	Deputy Head Teacher	49	2.59	1.19
TR2	Teacher	223	2.35	0.98
	Deputy Head Teacher	49	2.24	0.75
TR3	Teacher	223	2.02	0.48
	Deputy Head Teacher	49	2.14	0.98
TR4	Teacher	223	2.61	1.30
	Deputy Head Teacher	49	2.55	1.49
TR5	Teacher	223	1.93	0.38
	Deputy Head Teacher	49	1.98	0.56
TR6	Teacher	223	3.52	1.32
	Deputy Head Teacher	49	3.59	1.34
TR7	Teacher	223	2.25	0.86
	Deputy Head Teacher	49	2.24	1.28
Cluster	Teacher	223	2.46	0.89
Mean	Deputy Head Teacher	49	2.45	1.08

**Table 6. Independent T-test results for provision of in-service training**

Training		Levene's test for equality of variance			T-Test for equality of means					
Resp	n	Mean	Std	F	Sig.	t	df	Sig. (2-tailed)	Mean Differ	Std Error Differ
TEA	223	2.46	1.07	2.415	.121	.048	270	.961	.00842	.17375
DHT	49	2.45	1.23							

Key: Resp = Respondent, n = Number of respondent, Std = Standard deviation, Differ = Difference

**Table 7. Summary of regression of in-service training and academic achievement**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	SEE	F. Change	Change statistics		
						df 1	df2	Sig. F. Change
1	.898	.807	.806	.55028	1128.644	1	269	.000

**Table 8. Anova table for regression on in-service training and academic achievement**

Model	Sum of squares	df	Mean square	F	Sig
Regression	341.758	1	341.758	1128.644	.000
Residual	81.757	270	.303		
<b>Total</b>	<b>423.515</b>	<b>271</b>			

The Table 8 reveals that the R-value of .898 was significant ( $F=1128, p<.05$ ). Hence the observed influence of in-service training on academic achievement of pupils did not occur by chance. The finding of this study is consistent with the results of many studies where scholars found that training was positively and significantly associated with organizational performance. According to [20] and [21] training is positively and significantly related to human resource outcomes and organizational performance. Moreover, a study by [7] investigating the impact of training on organizational outcomes in the Central and Eastern Europe revealed that training positively and statistically influenced ( $r=.181; p<.05$ ) organizational outcomes expressed by productivity, profitability, service quality and rate of innovation.

#### 4. CONCLUSIONS

Based on the hypothesis and the objectives of this study, the following conclusions are arrived at:

- i. There is a statistically significant relationship between the provision of in-service training to teachers and the academic achievement of pupils in public primary schools.
- ii. The extent of provision of in-service training in Teso North sub-county was low.
- iii. The Ministry of Education had not yet developed in-service training policy and this had led to a situation of lack of proper coordination and harmonization of the scanty in-service training offered to the primary school teachers in the sub-county in particular and the country in general.

#### 5. RECOMMENDATIONS

- i. The Ministry of Education needs to formulate in-service training policy for the

teachers and the training should be structured and closely aligned with the acquisition of skills and knowledge gaps. The in-service training requires a systematic approach whereby its design is based on gathered data about teachers' needs. Hence the assessment should include an analysis of how well the schools were achieving their academic goals, the strengths and the weaknesses of the current teaching force. A careful analysis of these aspects would provide valuable information for the designing of effective in-service training activities.

- ii. The policymakers in the Ministry of Education should formulate an in-service training policy and broaden the concept of in-service training of teachers to mean a growth continuum of ongoing.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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