

# Relationship between Cognitive Engagement in Classroom Activities and Academic Performance among form Three Students in Meru County, Kenya

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## ABSTRACT

Over the past five years (2019 to 2023), Meru County secondary schools have consistently generated subpar examination scores. Failure in national exams increases the likelihood that a student will not qualify for further education and training in most occupations. The goal of this study was to ascertain whether cognitive engagement in classroom activities among Form Three pupils in Meru County, Kenya, predicts academic progress. The following goal served as the study's direction: To determine the relationship between students' academic performance and their cognitive engagement in classroom activities. The theoretical framework was based on Finn's school engagement theory. The investigation used a correlational research design. All Form Three pupils in Meru County made up the study's population in 2024, while research respondents were chosen by simple random sampling. Schools that participated in the study were chosen through stratified sampling. The study sampled 406 (203 boys and 203 girls) Form Three students from 14 sampled schools. One mixed-day secondary school was the subject of a pilot study; it did not take part in the main study. Data were gathered by having students complete a questionnaire. The students' engagement scale was used as a measure of engagement in classroom activities. The grades from the final 2024 term two exam, which were received from the school files, were used as a measure of academic performance. Data were examined using descriptive and inferential statistics. Quantitative data were analyzed using Pearson's Product Moment Correlation Coefficient. The findings revealed that there was a positive and significant relationship between students' cognitive engagement in classroom activities and academic performance ( $r(378) = .21$ ). The study could provide instructors and school counselors with knowledge on the connections between students' Cognitive engagement in classroom activities and academic performance. The study recommends that teachers, parents, and education stakeholders encourage students' cognitive engagement as it is associated with that academic performance

**Keywords:** Cognitive, Engagement, Performance, Relationship

## INTRODUCTION

Academic performance is widely regarded as one of the most important indicators of educational success because it reflects the extent to which learners have attained the intended learning outcomes. It serves as a key criterion for determining students' progression to higher levels of education and influences their future educational and career opportunities. At a broader level, the academic achievement of students contributes significantly to the development of a nation's skilled workforce and leadership, thereby promoting social and economic development (Newton, 2015). Conversely, poor academic performance remains a major concern for educators, parents, and policymakers because it limits students' opportunities for further education and meaningful participation in national development.

Academic performance is commonly assessed using students' scores in examinations, continuous assessment tests, or overall grade point averages, which reflect the knowledge and skills acquired during the learning process

(Dinga, 2018). It provides an objective measure of the extent to which educational goals have been achieved. According to Mekonnen (2014), low academic performance refers to achievement that falls below the expected standard of competence or educational expectations. Despite numerous educational reforms and increased investment in education, low academic performance continues to be reported in many educational systems, suggesting the need to identify learner-related factors that contribute to academic success.

One learner-related factor that has attracted considerable attention is cognitive engagement in classroom activities. Cognitive engagement refers to the psychological investment and mental effort that learners devote to understanding academic content, mastering complex concepts, and applying effective learning strategies (Randall & King, 2018). It encompasses learners' willingness to exert effort beyond minimum requirements by employing higher-order thinking skills such as critical thinking, self-regulation, problem-solving, and deep processing of information. Gul (2022) describes cognitive engagement as learners' active mental involvement characterized by sustained attention, concentration, absorption in learning tasks, and a commitment to understanding rather than merely memorizing content. Students who demonstrate high levels of cognitive engagement are more likely to internalize knowledge, transfer learning to real-life situations, and persist when faced with challenging academic tasks, thereby enhancing their academic performance.

Empirical evidence consistently suggests that cognitive engagement is positively associated with academic performance. Hao and Zhou (2018), in a study conducted at East China Normal University, reported that students who exhibited higher levels of cognitive engagement demonstrated better academic achievement than their less engaged counterparts. Similarly, Jonas (2016), in New Zealand, found that intellectually engaged students attained significantly higher academic grades than disengaged students. In South Africa, Schreiber and Yu (2016) established a positive relationship between students' engagement in learning activities and academic achievement. Comparable findings were reported in Nigeria by Abubakr and Al-Munnir (2018), who found that cognitively engaged students performed better academically than those with lower levels of engagement. Within the Kenyan context, Wara and Aloka (2018) established that secondary school students with higher levels of cognitive engagement recorded superior academic performance compared to their peers.

Although previous studies have consistently reported a positive relationship between cognitive engagement and academic performance, several gaps remain. Most studies have been conducted in contexts outside Kenya, limiting the generalizability of their findings to Kenyan secondary schools due to differences in educational systems and learning environments. Furthermore, existing local studies have largely examined student engagement as a multidimensional construct by combining cognitive, behavioral, and emotional engagement, with limited attention given to the unique contribution of cognitive engagement to academic performance. Consequently, there is insufficient empirical evidence on the relationship between cognitive engagement in classroom activities and academic performance among secondary school students in the study area. The current study therefore sought to examine the relationship between cognitive engagement in classroom activities and academic performance among Form Three students in public secondary schools in Meru County, Kenya.

## Statement of the problem

Despite ongoing efforts to improve educational outcomes, academic performance among secondary school students in Meru County remains a persistent concern. Over the past five years, the county has consistently recorded lower Kenya Certificate of Secondary Education (KCSE) mean scores than neighboring counties with comparable socio-economic characteristics. While Meru County recorded mean scores of 3.694 (2019), 4.119 (2020), 4.340 (2021), 4.094 (2022), and 4.376 (2023), neighboring Tharaka Nithi and Embu counties demonstrated a more consistent upward performance trend over the same period. This persistent disparity raises concerns about the learner-related factors influencing academic performance in the county.

Previous studies conducted in Meru County have primarily examined factors such as the home environment, students' attitudes toward learning, motivation, and the availability of school resources. Although these factors have received considerable empirical attention, relatively low academic performance persists, suggesting that other learner-related factors warrant investigation. Cognitive engagement in classroom activities has been

identified as a key determinant of academic success because it reflects students' psychological investment, strategic learning, and persistence in academic tasks. However, limited empirical evidence exists on the relationship between cognitive engagement and academic performance among secondary school students in Meru County. This study therefore examined the relationship between cognitive engagement in classroom activities and academic performance among Form Three students in public secondary schools in Meru County.

## METHODS

### Research design

With correlation serving as the foundation, a correlational research design was implemented. According to Frankael (2015), a correlational study elaborates the extent to which additional constructs correlate without having to manipulate any of the variables. Since no manipulation of the variables was intended, the design was found appropriate for the study.

### Research Setting

Meru County is where this study was conducted. The study concentrated on Form Three secondary school students. The County was chosen because of poor academic success. Over the previous five years, Meru County's K.C.S.E mean score has been lower relative to surrounding counties with comparable socioeconomic status in Eastern Kenya. Neighboring counties include Tharaka Nithi and Embu County. Low academic performance may result in low social and economic development within the County. Examining the relationship between cognitive engagement in classroom activities and academic performance was therefore necessary.

### Research Respondents

The target population in Meru County in 2024 was all the Form Three students (4060). However, only 406 students from 14 chosen schools were sampled. Teachers of the Form Three classes at the chosen schools provided data on students' mean test results based on school records. From the sampled schools, students in Form Three were chosen because the findings were likely to be helpful to them as they got ready to start Form Four. Since Engagement in classroom activities may have an impact on Form Three students' academic success, they were targeted. Public and private schools that have taken five national examinations in the years 2019 through 2023 made up the fourteen schools.

### Validity and Reliability

Content Validity was ensured through expert review of the instruments. Experts in Educational psychology examined the items. The feedback was incorporated before the instruments were used for data collection.

Reliability was ensured through pilot testing the research instruments on a sample similar to, but not included in, the main study. The internal consistency of the instruments was assessed using Cronbach's alpha. Test Anxiety Inventory's original subscales had reliability values of alpha coefficients of .91 for both TAI-E and TAI-W. In reliability studies of the student engagement scale, the emotional engagement, cognitive engagement, behavioral engagement, and overall scale all had Cronbach's coefficients of internal consistency of .88, .88, .81, and .91, respectively.

### Research Instruments

Items from the Students' Engagement Scale (Finn, J. D., Folger, & Cox, 1991) were used to gauge students' cognitive level of Engagement in classroom activities, rated on a Likert scale with a scale of Never = 1, Sometimes = 2, Often = 3, and Always = 4.

The class teachers provided the participants' results for term two of 2024. Standard T-scores were generated from

the student results. The raw scores were first obtained, then standardized into Z scores; the Z scores were then transformed into T scores for interpretation. The formula  $T=50+10Z$  was used to convert Z scores to Scores.

Three groups of academic performance were created from the scores. Scores less than 40 were considered to have low academic success, and 40 to 59 were considered to have average academic success. High levels of academic success were defined as t-score values of 60 and higher.

### **Data Gathering Procedure**

The secondary school principals of the sampled schools were asked for permission before the data collection process began, which took three weeks. The researcher distributed the research tools with the aid of the classroom instructors. The researcher instructed the respondents and walked them through how to answer the questions in the questionnaire. If a statement was unclear, the respondents were encouraged to ask for clarification. The questionnaires required an average of 30 minutes to complete. The researcher asked the respondents' form three teachers to provide the results of their second -term exams in 2024. To maintain anonymity, the participants were instructed not to write their names down on the questionnaire.

### **Ethical Considerations**

The purpose of the study was clearly explained to the respondents by the researcher. They were asked to voluntarily participate in the study by the researcher. The researcher also let the respondents know that she would keep their answers to the questionnaire's questions confidential. By requesting that respondents do not include their names or any other personal information on the questionnaire, anonymity was guaranteed.

### **Data Analysis**

The data were analyzed using inferential and descriptive statistics. The suggested statistical tests were used to formulate and test the null hypotheses at  $p = .05$ . Pie charts, graphs, percentages, and frequency tables were used to represent the data for the descriptive statistical analysis and to show respondents' descriptive variables.

## **RESULTS AND DISCUSSIONS**

This section presents the study findings, interpretation and the discussion of the results based on the study objective and hypotheses.

### **General Information**

This section mainly summarizes the questionnaire response rate.

### **Questionnaire Return Rate**

The study targeted 406 participants made of 203 girls and 203 boys. After the data collection exercise, 26 questionnaires were not included in the data analysis. These questionnaires were discarded for various reasons. To begin with, in some questionnaires the respondents selected the same response throughout. In other situations, the responses indicated incorrect code numbers, while others marked multiple responses for one item. As such, these questionnaires were concluded to have not met the required quality criteria. Therefore, 380 questionnaires were retained for main analysis, representing 93.95% response rate.

### **Descriptive Analysis for Cognitive Engagement in Classroom Activities**

Descriptive statistics for Cognitive Engagement in Classroom Activities and academic performance were conducted and presented in the following section. The analysis began by carrying out the descriptive analysis of the academic performance scores, and the results were summarized in Table 3.1

**Table 3.1**

*Descriptive Analysis of Students' Academic Performance*

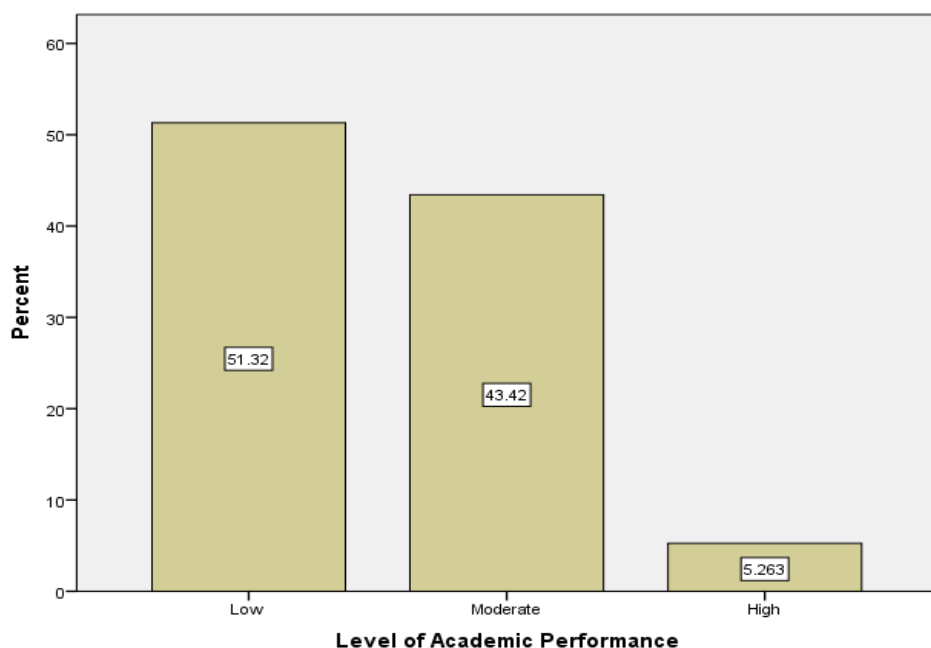
|         | N   | Range | Min   | Max   | Mean  | Std. Deviation | Skewness  |            | Kurtosis  |            |
|---------|-----|-------|-------|-------|-------|----------------|-----------|------------|-----------|------------|
|         |     |       |       |       |       |                | Statistic | Std. Error | Statistic | Std. Error |
| T Score | 380 | 50.43 | 32.60 | 83.03 | 50.00 | 10.00          | .523      | .125       | -.025     | .250       |

Note. N=380; F=frequency; % =Percentage; Max= Maximum; Min= Minimum

As indicated in Table 3.1, the students' academic achievement scores were transformed to T scores with a mean of 50.00 ( $SD=10$ ). The distribution of scores was slightly positively skewed ( $skewness = 0.53$ ,  $SE = 0.13$ ) and approximately normal in terms of kurtosis ( $kurtosis = -0.03$ ,  $SE = 0.25$ ). The positive skewness indicated that the majority of the students scored poorly.

The participants' scores in academic performance were further used to classify them into three levels of low, moderate, and high levels of academic performance. The results are given in Figure 3.1.

**Figure 3.1 Levels of Academic Performance**



As shown in Figure 3.1, more than half (51.32%) of the participants had low levels of academic performance. Nearly 43.42% of participants rated themselves as having moderate levels of academic performance. Besides, 5.26% of the participants were found to have high levels of academic performance. Having analyzed the levels of students' academic performance, the researcher conducted a more in-depth analysis on Cognitive Engagement in Classroom Activities. The outcomes were reported in Table 3.2.

**Table 3.2**

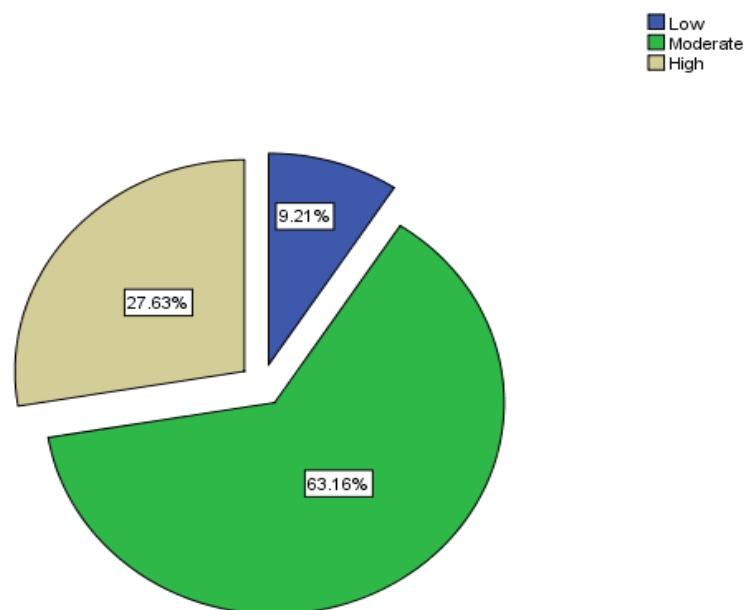
*Descriptive Analysis of Cognitive Engagement in Classroom Activities*

|                             | N   | Range | Min  | Max   | Mean  | SD   | Skewness |            | Kurtosis |            |
|-----------------------------|-----|-------|------|-------|-------|------|----------|------------|----------|------------|
|                             |     |       |      |       |       |      |          | Std. Error |          | Std. Error |
| Cognitive Engagement Scores | 380 | 24.00 | 8.00 | 32.00 | 21.10 | 4.06 | .06      | .13        | -.18     | .25        |

Note. N= 380; SD= Standard Deviation; Max= Maximum; Min= Minimum.

Table 3.2 indicates that the students' cognitive engagement scores had a mean of 21.10 ( $SD=4.06$ ). The data in Table 3.2 were examined for normality using skewness and kurtosis values. The skewness was 0.06 ( $SE = 0.13$ ), suggesting that the distribution was approximately symmetrical. The kurtosis was -.18 ( $SE = 0.25$ ), indicating a distribution with slightly less peakedness than a normal distribution, hence a platykurtic distribution. Further analysis was done to show Cognitive engagement levels, and result given in Figure 3.2.

**Figure 3.2** Levels of Cognitive Engagement



As shown in Figure 3.2, nearly 27.63% of the respondents rated themselves as having high levels of cognitive engagement in classroom activities. More than half (63.16%) of the respondents had moderate levels of cognitive engagement in classroom activities. Besides, 9.21% of participants rated themselves as having low levels of cognitive engagement in classroom activities. The researcher further conducted analysis on the means of academic performance scores across different levels of Cognitive Engagement. The outcomes were reported in Table 3.3

**Table 3.3**

*Mean Academic Performance across Levels of Cognitive Engagement*

| LCE      | N   | Range | Min   | Max   | Mean  | SD    | Skewness  |            | Kurtosis  |            |
|----------|-----|-------|-------|-------|-------|-------|-----------|------------|-----------|------------|
|          |     |       |       |       |       |       | Statistic | Std. Error | Statistic | Std. Error |
| Low      | 35  | 40.62 | 32.60 | 73.22 | 45.33 | 10.61 | 1.141     | .398       | .927      | .778       |
| Moderate | 240 | 49.73 | 33.30 | 83.03 | 49.59 | 8.93  | .488      | .157       | .379      | .313       |
| High     | 105 | 48.82 | 34.21 | 83.03 | 52.48 | 11.43 | .322      | .236       | -.682     | .467       |

Note. N= 380; SD= Standard Deviation; Max= Maximum; Min= Minimum.

As reported in Table 3.3, the computation results indicated that students categorized as having a high level of cognitive engagement had the highest academic performance mean score ( $M=52.48$ ,  $SD=11.43$ ), while the students falling within the category of low cognitive engagement had the lowest academic performance mean score ( $M = 45.33$ ,  $SD = 10.61$ )

## Hypothesis testing

The objective of the study was to investigate the relationship between students' Academic Performance and their

cognitive engagement in classroom activities. The null hypothesis was stated.  $H_{01}$ : There is no relationship between students' Academic Performance and their cognitive engagement in classroom activities. Pearson product-moment correlation analysis was done to test this hypothesis. The outcomes were reported in Table 3.4.

**Table 3.4**

*Correlation coefficient for Academic Performance and Cognitive Engagement Scores*

|                                                              |                     | T Scores | Cognitive Engagement Score |
|--------------------------------------------------------------|---------------------|----------|----------------------------|
| T Scores                                                     | Pearson Correlation | 1        | .211**                     |
|                                                              | Sig. (2-tailed)     |          | .000                       |
|                                                              | N                   | 380      | 380                        |
| Cognitive Engagement Score                                   | Pearson Correlation | .211**   | 1                          |
|                                                              | Sig. (2-tailed)     | .000     |                            |
|                                                              | N                   | 380      | 380                        |
| **. Correlation is significant at the 0.01 level (2-tailed). |                     |          |                            |

Note. N= 380

The results from Table 3.4 indicated a weak, positive, and statistically significant relationship between students' academic performance scores and cognitive engagement in classroom activities scores ( $r(378) = 0.21, p < .05$ ). The magnitude of the correlation was weak, indicating that cognitive engagement was associated with academic performance but accounted for only a small proportion of the variation in performance. The null hypothesis was rejected because the observed relationship was statistically significant.

## DISCUSSION OF THE RESULTS

The objective of this study was to establish the relationship between the students' cognitive engagement in classroom activities and their academic performance. The findings of the study indicated that there was a significant and positive relationship between students' academic performance scores and cognitive engagement in classroom activities scores ( $r(378) = 0.21, p < .05$ ). The null hypothesis was rejected.

These findings were in line with those by Delfino (2019) conducted a study at Partido State University in the Philippines to look into the variables affecting student involvement and how cognitive engagement affects students' academic performance. The findings were significant in addressing the problem of the proposed study, but the target of this study was secondary school students. These findings implied that the students who scored highly on the cognitive engagement sub-scale were likely to be higher achievers than their counterparts revealing an association between cognitive engagement and academic performance.

The findings of the current study were also consistent with another study done in Kenya by Wara and Aloka (2018) conducted in Manga Sub County, to determine how a student's cognitive engagement affects academic attainment. According to the findings, pupils' cognitive engagement was positively associated with their academic performance. Although the previous research study was conducted in Nyamira County, Kenya, the current study used a sample of students from Meru County to further explore this association. However, the findings of the current study contradicted the findings of a study done by Hasan and Semra (2016) to explore the association between cognitive engagement and academic performance among seventh-grade Turkish learners. The research revealed that cognitive engagement failed to predict students' academic performance significantly. The findings were significant to address the problem of the proposed study, but the target of this study was secondary school students.

## CONCLUSION

The study sought to establish the relationship between students' cognitive engagement in classroom activities and their academic performance. The findings revealed a weak, positive, and statistically significant relationship between cognitive engagement in classroom activities and academic performance. This finding indicates that

higher levels of cognitive engagement were associated with higher academic performance scores among the students. The finding underscores the relevance of cognitive engagement in understanding variations in students' academic performance. Cognitive engagement encompasses learners' active involvement in thinking, processing information, applying knowledge, and participating meaningfully in classroom learning activities. Therefore, fostering classroom practices that encourage students to think critically, attend to learning tasks, and participate actively may be valuable in supporting positive learning outcomes.

## RECOMMENDATIONS

Findings from this study have implications for secondary school students and educators in Kenya regarding the relationship between students' cognitive engagement in classroom activities and academic performance.

- i. The teachers should provide the students with opportunities where they can strengthen their cognitive engagement in classroom activities.
- ii. This research was done in secondary schools and in Meru County. Considering that learning experiences differ from one County to another, there is a need for a similar study engaging students from other counties.
- iii. Since this study found that students' engagement in classroom activities has a positive and significant relationship, there is a need to carry out a further study and establish other factors which predict academic performance.

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