

## Influence of School Physical Facilities on Academic Self-Concept in Informal Settlements in Kenya

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### ABSTRACT

*The school environment plays a crucial role in shaping the academic self-concept of primary school learners. This study aimed to assess the influence of school physical facilities on the development of academic self-concept among the 9,536 primary school pupils in Kibra Sub-County, Nairobi. Bronfenbrenner's ecological systems theory provided the underpinning for this research. Employing a descriptive survey design, data was collected from a sample of 385 respondents selected through stratified and purposive sampling techniques. Questionnaires were used for learners in Class VII, while interviews were conducted with 35 head teachers and 35 teacher-counsellors. The study revealed that academic self-concept among pupils in informal settlement primary schools is adversely affected by inadequate physical facilities. Statistical analysis using SPSS 23 showed a Pearson's Product Moment Correlation coefficient ( $r = 0.728$ ;  $p < 0.05$ ) at the 0.05 level of significance, demonstrating a high degree of internal dependability in the collected data. In conclusion, the study highlights the detrimental impact of inadequate school physical facilities on the academic self-concept of learners in informal settlement primary schools. The findings offer valuable insights for the Ministry of Education to enhance the learning environment and enforce policies to create a child-friendly school environment.*

**Keywords:** Academic Self-Concept, Informal Settlements, Physical Facilities, Primary Schools, School Environment

### I. INTRODUCTION

Physical school resources encompass a range of elements, including buildings, premises, libraries, laboratories, and educational materials. These physical assets have significantly contributed to students' self-assurance in their academic capabilities (2012). According to Avery (2012), schools that invest in physical infrastructure create a more conducive environment for student achievement than those that do not. Boakye-Boaten (2010) posits that high-quality school facilities are a crucial factor in shaping students' academic experiences. They're also linked to students' success in the classroom (Chepkonga, 2017). The physical environment and the availability of appropriate instructional materials are cornerstones of the curriculum implementation procedure (Stevenson, 2007).

Shavelson (2010) posits that school physical facilities influence academic self-concept by providing a comfortable, safe, and well-resourced environment that enhances students' confidence and belief in their academic abilities. Clean, inclusive, and inspiring facilities can positively impact students' self-perception and motivation to excel academically. According to Zhang et al. (2018), the school environment entails a set of factors or relationships within a school microsystem with immense contribution to learners' development of academic self-concept. These include, but are not limited to, the provision of physical facilities, curriculum support materials, security, and the promotion of teacher-learner interactions.

Buckley et al. (2004) argue that students perform better in classes where the instructor has enough space to teach and students are provided with the equipment to do so. This suggests that a favourable influence on student success might result from the availability and appropriate usage of school facilities in the interest of the instructor to teach well. School infrastructure is crucial to the well-being of educators and students, and its upkeep is essential to the advancement of educational quality.

Researchers have hypothesised that the quality of schools' physical infrastructure and amenities indirectly affects the standard of education students get. The classroom furnishings and tools should be sized and age-appropriate for the students. How kids study and play might be affected by their furnishings. In Zimbabwe, children

are at risk for soil-related diseases due to a lack of age-appropriate furniture and sleeping quarters, as reported by non-formal primary school instructors (Mugweni et al., 2011).

A child's educational growth may be greatly bolstered by creating a physically and mentally stimulating atmosphere for them to learn in. Students' success in attaining a variety of learning goals is significantly impacted by the classroom setting. Light, colour, temperature, and even where students are seated may have a significant impact on their ability to study (Apter, 2014). Thus, the goal of this study was to look at how school physical facilities influence academic self-concept in informal settlements in Kenya.

## II. LITERATURE REVIEW

### 2.1 Theoretical Framework

The theoretical framework for this study draws upon Bronfenbrenner's (2001) ecological systems theory, which is particularly relevant to understanding the development of academic self-concept among primary school students. This theory provides a comprehensive perspective that extends beyond the immediate classroom and recognises the dynamic interplay between individuals, communities, and institutions in shaping a child's development.

Bronfenbrenner's ecological systems theory posits that a child's environment interacts with and influences their growth and development over time. In this context, the theory underscores the significance of the environment in comprehending the experiences of primary school students. It conceptualises the ecology of learners' development of academic self-concept as being dependent on various dynamics within the primary school setting (Hayes, 2017). These dynamics encompass not only the classroom but also the broader school environment, community, and institutional factors.

The theory acknowledges that a number of factors in the primary school environment have an impact on students' ability to develop a strong motivation to engage in academic endeavors. These factors include the quality of physical facilities, the availability of curriculum support materials, the security of the school, and the nature of teacher-learner interactions (Bronfenbrenner, 2001). By employing ecological systems theory, this study acknowledges the multifaceted nature of the primary school environment and its role in shaping students' academic self-concept. It emphasises the importance of considering the interconnectedness of these factors and how they evolve over time, ultimately affecting students' motivation and self-perception in academic activities.

### 2.2 Conceptual Framework

In this study, the academic self-concept of students living in informal settlements served as the dependent variable, while the Provision of Physical Facilities, served as the independent variable. As can be seen in Figure 1 below, the intervening factors consisted of staff attitude, head teachers' management styles, and stakeholders' support.



**Figure 1**  
*Conceptual Framework*

### 2.3 Empirical Review

Physical school resources include such things as buildings, grounds, libraries, labs, and classroom supplies (Beynon, 2012). U.S. researchers Rivkin et al. (2011) found a correlation between students' access to adequate school facilities and their academic achievement, lending validity to these arguments. Consistent with these results, a survey of 113 people in Scotland conducted by Avery (2012) found that the country has a wide variety of library types available for both public and academic usage.

According to Avery (2012), schools that invested in a well-stocked library saw greater gains in student achievement than those that did not. This provides more evidence that well-trained librarians benefit classroom instruction by stocking the library with items directly connected to the curriculum, encouraging students to read widely, and assisting the school community in acquiring the information literacy skills they need. However, the increased demand on already overburdened resources brought forth by universal free primary education's success stories has stifled students' confidence in their own academic abilities. Physical facilities are the second largest expense in a school system, behind teacher wages and benefits.

Researchers have hypothesised that the quality of schools' physical infrastructure and amenities indirectly affects the standard of education students get. The classroom furnishings and tools should be sized and age-appropriate for the students. How kids study and play might be affected by their furnishings. According to Khan and Iqbal (2012), schools receive physical facilities and infrastructure resources to support the teaching and learning process. In Zimbabwe, children are at risk for soil-related diseases due to a lack of age-appropriate furniture and sleeping quarters, as reported by non-formal primary school instructors (Mugweni, Mufanechiya, & Dhloomo, 2011).

According to research conducted in South America (Latin America) and cited by Redan et al. (2014), a lack of adequate school physical facilities and infrastructure has a direct impact on the quality of instruction and, by extension, student achievement. Hailu and Biyabeyen (2014) investigated the relationship between the quantity and quality of available educational amenities in Ethiopia. The sample included 24 elementary institutions in the Hararge zone's eastern part and 12 in the Harari regional state of Ethiopia. Findings from this study revealed that inadequate school infrastructure and inferior instructional materials were serious obstacles to classroom instruction and impeded efforts to improve education quality.

Olaleye (2018) assessed the condition of Nigeria's elementary schools in the state of Osun. All of the state's primary school educators were the intended audience. A descriptive research methodology was used for this study. According to the research, the institutions lacked basic furnishings such as toilets (also known as latrines or ablution facilities), desks, and chairs.

The Caviola (2021) study aimed to discover more about the effects of noise on education generally and arithmetic performance in particular. In a classroom setting, 162 kids aged 11–13 were given a mental calculation assignment. Three listening circumstances were selected to mimic the range of noise levels often seen in urban classrooms: silence, traffic, and classroom noise. There was a negative correlation between the listening condition and the children's mathematics performance that varied with task complexity and age. These results suggested that the effect of noise on children's performance varied with the difficulty of the activity being performed.

Magaki et al. (2021) and Rosenfield et al. (1985) both studied the effects of classroom layout on student behavior. Students in primary grades were evaluated in terms of their on-task expressions, like hand-raising, discussion commenting, questioning/pupil requesting, listening, and speaking; and off-task behaviours, like withdrawal, aggression, and disruptive conduct. All of the aforementioned dependent variables have precise definitions and underwent expert evaluation. There were three conceivable layouts for the desks: huddles, rows, and circles. Students who sat in circles were found to be more focused and attentive than those in other seating arrangements. Rows of workstations are the least productive, whereas clusters of desks are the next best option. Gender, age, and motivation to learn also played a role, as may be predicted.

Earthman and Lemasters (2013) discovered that students who attended school in above-average facilities performed better on the Comprehensive Test of Basic Skills than students who attended school in below-average facilities. These results suggest that factors such as climate control, the absence of graffiti, the state of science laboratories, locker facilities, the quality of classroom furniture, the colour of the walls, and the quality of the acoustics have a significant impact on students' sense of academic pride and achievement.

Muthanje (2018) looked at the impact of physical facilities on enrollment in Early Childhood Development and Education (ECDE) programmes in public elementary schools in Embu County, Kenya, as part of a larger study on the mainstreaming of ECDE. 77% of the participating instructors said that their facilities were insufficient, citing issues including dim lighting, hard flooring, and desks that were too small for their students as examples. The study's results suggested that classroom settings had an effect on students' attendance. Classrooms, drinking fountains, and a playground were among the examples of undersized infrastructure. Therefore, the school's operations suffered as a result. This study is consistent with a UNESCO (2008) assessment that found that insufficient classroom illumination, classroom quality, and the state of children's desks all played a role in low student involvement in Uganda, particularly among girls.

Viluti (2019) conducted research in Kibra Sub-County and found that students' motivation to attend school increased when they had access to shared pupil-support facilities like resource centres, laboratories, and playgrounds.

Despite these findings, neither Viluti (2019) nor other empirical researchers have provided clear evidence for the role of specific types of physical facilities in fostering academic self-concept among primary school students in informal settlements. Rather, they imply that students are more at ease and more likely to grasp concepts when taught in a school with adequate physical resources. This, in turn, improves their sense of academic competence since they believe in their own capacity to study.

### III. METHODOLOGY

The survey method was used for this descriptive research. The survey method was chosen because it could be used to gather data from a representative sample of the whole population, was more cost-effective, yielded more reliable findings, and was more flexible (Singh & Chaudhary, 1986). The study was conducted in Kibra Sub-County, Nairobi, with a total population of 185,777 people and 138 registered non-formal primary schools. The target population comprised 138 headteachers, 203 teacher-counsellors, and 9,536 Class VII students, totaling 9,877 potential respondents. To ensure representative findings, the sample size was calculated using Yamane's formula, resulting in a desired sample size of 385 respondents. The study employed stratified sampling, dividing the region into seven zones. Purposive sampling was used to select 35 headteachers and 35 teacher-counsellors, while 315 students in Grade VII were randomly selected from the sampling schools. Data was collected through questionnaires with Likert-scale questions and interviews. The piloting of instruments with 38 respondents ensured their appropriateness and the language used. Data analysis involved both descriptive statistics and thematic analysis, with results presented through tables and narrative formats.

### IV. FINDINGS AND DISCUSSION

#### 4.1 Response Rate

The seventh grade students in this research were given a total of 315 questionnaires, of which 289 were completed and returned. The study also included interviews with 30 school principals and 30 school counselors. Table 4.1 displays the resulting response rates.

**Table 1**

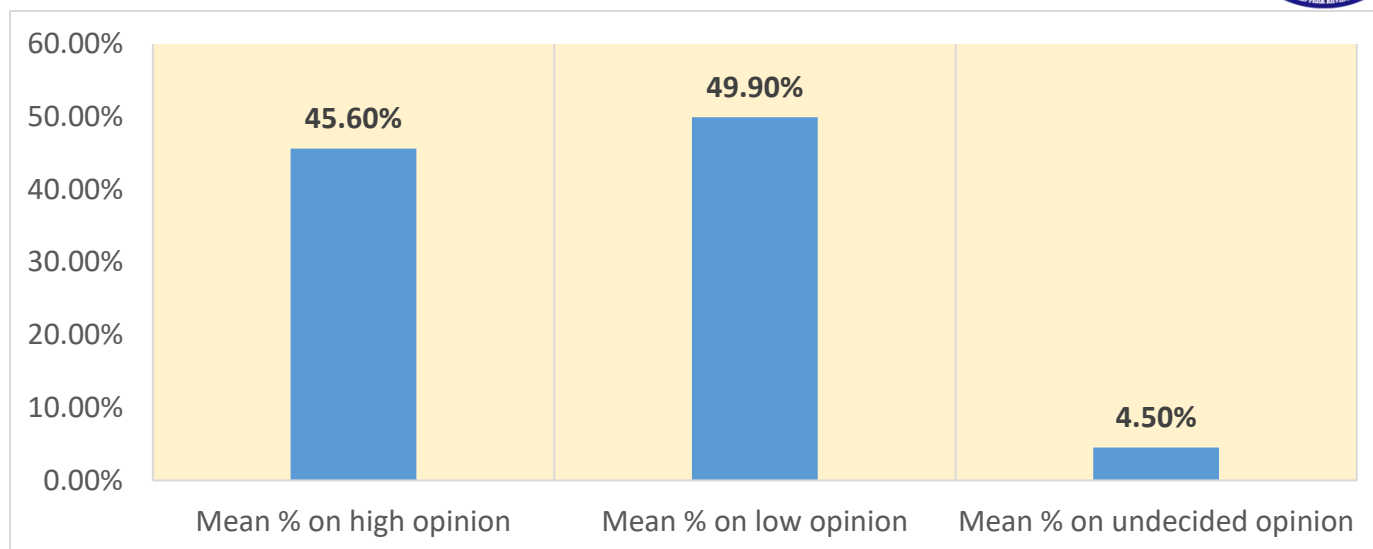
*Response Rate*

Respondents	Sampled Respondents	Those Who Participated	Achieved Return Rate (%)
Headteachers	35	30	85.7
Teacher-counsellors	35	30	85.7
Learners in Class VII	315	289	91.7
<b>Total</b>	<b>385</b>	<b>349</b>	<b>90.6</b>

Table 1 displays a total response rate of 85.7% from principals, 85.7% from teacher-counsellors, and 91.7% from students in grade 7. The overall response rate averaged 90.6%. This supported Creswell's (2014) conclusion that results may be generalised to the intended population with a response rate of 75.0 or above.

#### 4.2 Provision of Physical Facilities and Pupils' Academic Self-concept

The study sought to assess the extent to which the provision of physical facilities in primary schools in informal settlements influences the academic self-concept of pupils. Descriptive data was collected from learners in class VII, organised into specific thoughts, and the results are shown in Figure 2.



**Figure 2**

*Views of Learners in Class VII on the Influence of Provision of Physical Facilities on Academic Self-concept of Pupils in Primary Schools in Informal Settlements in Kibra Sub-County, Nairobi County, Kenya.*

Majority 49.90% of the learners in class VII strongly were of low opinion on the view that the physical facilities in primary schools in informal settlements did look good which has enhanced pupils' desire to go to school followed by those who had high opinion on the same at 45.6%.

In other words, majority of them were in strong agreement that the buildings in primary schools in informal settlements are dilapidated.

On their part, during the interviews, the headteachers and teacher-counsellors, despite admitting that there existed challenges with provision of adequate and conducive physical facilities, stated that there was provision of facilities to cater for all learners. Headteacher, H6, stated;

*In my primary school, we have tried to provide conducive buildings and classrooms to help learners take part in their academic activities. Though there has been a challenge with space, but adequate effort has been made to ensure that all learners are accommodated. There is adequate lighting and ventilation and all pupils provided with chairs and desks.*

Teacher-counsellors echoed the views expressed by the headteachers. They stated that amid the challenges which primary schools in informal settlements incur, there is provision of physical facilities which can enable pupils to undertake their learning activities. Teacher-counsellor, TC5, noted;

*In my primary school, there is considerable effort to provide physical facilities to cater for the interest of all learners. Though not spacious, classrooms are well-ventilated and have good lighting with few instances of overcrowding. Toilets are few though are clean and washed on a daily basis.*

Despite these divergent opinions, the data suggests that students are more engaged in school and more likely to establish a positive academic identity when adequate physical facilities are provided. Earthman and Lemasters (2013) found that students who attended school in facilities that met or exceeded minimum standards performed better on the Comprehensive Test of Basic Skills than their peers who attended school in facilities that fell below minimum standards.

During the interviews, the headteachers and teacher-counsellors supported the view expressed by majority of the learners that noise pollution within the school vicinity is a serious distraction for learning. Headteacher, H7, stated;

*Instances of noise pollution around my school is rampant and has been a distortion to learning to an extent where many learners do not feel happy or glad to attend school programmes.*

Similar views were expressed by the teacher-counsellors who noted many pupils are not glad to attend primary schools located in the informal settlements. On further probing, teacher-counsellor, TC6, observed;

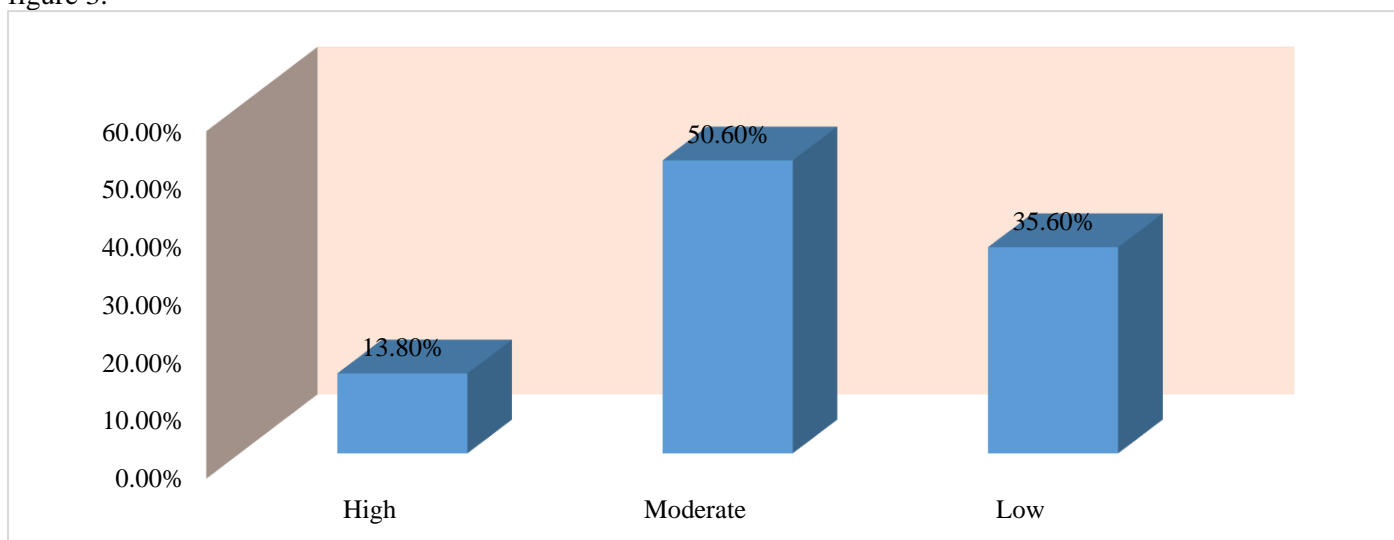
*Within the neighbourhood of my primary school, noise pollution has become a serious occurrence which, in many occasions interferes with learning activities. This has made many pupils to lose interest in learning activities and even sometimes, stay away. They do not feel comfortable and glad attending academic activities in primary schools in informal settlements.*



This builds on the work of Caviola (2021), who investigated the impact of ambient noise on education generally and on arithmetic performance in particular. In a classroom setting, 162 kids aged 11-13 were given a mental calculation assignment. Three listening circumstances were selected to mimic the range of noise levels often seen in urban classrooms: silence, traffic, and classroom noise. There was a negative correlation between the listening condition and arithmetic performance that increased with task complexity and with the age of the children. These results suggested that the impact of ambient noise on children's performance varied with the difficulty of the job being performed.

### 4.3 Inferential Statistics

To test the null hypothesis,  $H_{01}$ : *There is no statistically significant influence of provision of physical facilities on development of academic self-concept among pupils in primary schools in informal settlements*, data were collected from the 30 teacher-counsellors on the levels of adequacy (Adequate = 3, Not adequate = 2 and Not Sure = 1) of physical facilities and the number of learners sampled in class VII who set academic goals. The results are shown in figure 3.



**Figure 3**  
*Provision of physical facilities*

Few learners were of the opinion that high level of adequacy of physical facilities determined the number of learners who set academic goals (13.80%). Conversely, the majority did not believe so (50.60% for moderate and 35.6% for low levels). As can be seen in Figure 4.3, providing students with proper physical facilities aids in the formation of a positive academic identity. That is to say, when school infrastructure is better, more students acquire a positive view of themselves as capable students, leading them to aim higher in their studies.

These findings were put through an analysis using Pearson's Product Moment Correlation, and the results are shown in Table 4.2 as follows:

**Table 2**  
*Pearson's Product Moment Correlation Analysis Showing Relationship Between Levels of Adequacy of Physical Facilities and the Pupils' Academic Self-concept*

		Pupils' Academic Self-concept
Levels of Adequacy of Physical Facilities	Pearson Correlation	.507**
	Sig. (2-tailed)	0.004
	N	30

\*\* . Correlation is significant at the 0.001 level (2-tailed).

In Table 2, we can see the outcomes of a correlation analysis using Pearson's Product-Moment. This research was conducted to learn more about how students' academic self-concepts and the availability of adequate physical resources influence each other while setting personal academic goals. The significance level (p-value) obtained from

the test, 0.004, was lower than the predetermined threshold of 0.05; hence,  $p\text{-value} = 0.0040 < 0.05$  represents this mathematical connection. The correlation coefficient ( $r$ ) obtained from the test was 0.507. Therefore, the null hypothesis was rejected. These results provide more evidence that elementary schools in slum areas benefit greatly when proper physical resources are made available to the students.

## V. CONCLUSIONS & RECOMMENDATIONS

### 5.1 Conclusions

The study found that the provision of physical facilities in primary schools located in informal settlements significantly influences the academic self-concept of pupils. However, the study revealed that many primary schools in these settlements face challenges, with substandard buildings, inadequate classroom space, insufficient toilets, and a lack of well-ventilated classrooms and desks for all pupils. While some headteachers and teacher-counsellors disputed these challenges, they acknowledged that there were issues with providing adequate and conducive physical facilities. This suggests that the full provision of physical facilities to attract and motivate learners and enhance their academic self-concept has not been consistently achieved in schools in informal settlements. Noise pollution from surrounding activities was also identified as a significant distraction for learners, emphasising the importance of creating a conducive learning environment.

### 5.2 Recommendations

Based on these findings, it is recommended that primary schools in informal settlements prioritise improving their physical facilities, including classrooms, toilets, ventilation, and desk provisions, to create a more appealing and motivating environment for pupils. Schools should also work with the local community to address noise pollution issues, ensuring that learners can study without significant distractions. Additionally, educational authorities and policymakers should allocate resources and support to upgrade the infrastructure in these schools to enhance the academic self-concept and overall educational experience of pupils. This study underscores the importance of addressing physical facility challenges in informal settlement schools to promote a positive academic self-concept among learners.

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