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## Enhancing Public Integrated School Enrollment Thru Intersection of Infrastructure Development and Teacher Competency in Quezon, Bukidnon, Philippines

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### ABSTRACT

The research was conducted to answer the question of whether Infrastructure development and teacher competencies have a significant impact on enhancing the school enrollment in Public Integrated School in the following Integrated Schools of Quezon District, Division of Bukidnon which are more or less 5 to 10 kilometers in radius from the two (2) big national high school within the municipality of Quezon, Bukidnon which may affect the influx of learners as well as their parents in choosing the schools to enrolled. The method used in this study is a quantitative approach with a survey method. The research was conducted at six (6) public integrated high schools in the Municipality of Quezon, Bukidnon from January to April 2025, with a sample size of 140 individuals selected through purposive sampling. This study used a questionnaire instrument with a Likert scale and simple linear regression analysis. The results showed a positive and significant effect of infrastructure development ( $X_1$ ) on the enrollment progress (Y) by 20.9%, a positive and significant effect of teacher competencies ( $X_2$ ) on the enrollment progress (Y) by 21.3%, and a significant simultaneous effect of infrastructure development ( $X_1$ ) and teacher competencies ( $X_2$ ) on the enrollment progress (Y), with the combined effect strengthening to 37.8%. Based on these results, the author suggests that schools should continue to improve the school infrastructure and the teacher competence as there is still considerable room for a positive impact on enhancing the school enrollment in integrated schools. Schools should also examine other factors that may influence the declining of school enrollment in integrated school for further study such as parents wants to experience their children as what they have experienced to enroll in the school where they graduated before the integrated school operated in the said area, elementary teacher competencies as preparatory for secondary level school and the involvement of Local Government Units (LGU).

### INTRODUCTION

In recent years, public integrated schools in the Philippines and other developing countries faced ongoing challenges in improving student enrollment. Many schools operated with limited and outdated infrastructure, which affected the learning environment and discouraged some families from enrolling their children. At the same time, teacher competency remained a concern, as not all teachers had access to regular training or professional development opportunities. According to the Department of Education (2023), several schools struggled with overcrowded classrooms, lack of learning materials, and insufficient facilities, especially in rural or underserved areas. Despite efforts to build more classrooms and upgrade facilities, enrollment rates did not always increase as expected, suggesting that infrastructure alone was not enough to attract and keep students in school (World Bank, 2023a; Yazon *et al.*, 2024). In addition, the integrated schools in Quezon District of Department of Education Bukidnon particularly the Linabo Integrated School from the year it was open school 2021 – 2022 up to school year 2023 – 2024 the enrollment has dropped to 53% the same reasons above-cited and near to big public schools with distance radius of more or less five (5) to ten (10) kilometers excluding secluded integrated school were very far from the big public school, roads are

not accessible by vehicles and cost of transportation are very high were their enrollment remains the same. These conditions were observed in various schools and were linked to lower student participation and engagement, ultimately affecting enrollment rates.

A gap existed in understanding how the combination of infrastructure development and teacher competency could work together to enhance enrollment in public integrated schools. While some studies showed that better buildings and resources led to higher enrollment, others found that skilled and motivated teachers played an even bigger role in keeping students engaged and reducing dropout rates (UNESCO, 2022b; Philippine Institute for Development Studies, 2021). However, few studies examined the intersection of these two factors, and how their combined effect might be greater than their impact alone. For example, Yazon *et al.* (2024) found that schools with both improved infrastructure and strong teacher competency achieved better student participation and retention, but many schools did not have both elements in place at the same time.

The relationship between infrastructure, teacher competency, and enrollment progress was supported by research showing that each factor contributed to school attractiveness and student success. The World Bank (2023) reported that while infrastructure upgrades made

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schools safer and more welcoming, teacher competency was closely linked to student learning outcomes and parental trust in the school. In the Philippines, the Department of Education (2023) and Yazon *et al.* (2024b) both found that when schools invested in both areas, enrollment rates improved more than when only one was addressed. Despite these findings, many public integrated schools continued to focus on one area at a time, missing the opportunity to maximize the benefits of a combined approach.

## LITERATURE REVIEW

### Infrastructure Development

#### International Studies

Research globally has shown varied impacts of infrastructure on enrollment. A 2023b World Bank study found that basic infrastructure improvements increased enrollment by 9-15% in low-income countries, but effects were smaller in middle-income regions where basic needs were already met. Similarly, UNESCO's 2022a Global Education Monitoring Report emphasized that while infrastructure is necessary, its impact plateaus without complementary investments in teaching quality and learning materials. A 2021 comparative study across 14 countries found that infrastructure explained between 18-25% of enrollment variance, aligning closely with the current finding of 20.9%.

#### Philippine Studies

In the Philippine context, the Department of Education's 2023 Basic Education Report noted that infrastructure projects had mixed results across regions, with urbanized areas showing smaller enrollment gains (5-10%) compared to previously underserved rural areas (15-20%). A 2022 study by the Philippine Institute for Development Studies found that infrastructure explained approximately 22% of enrollment variance nationwide, remarkably similar to this study's finding of 20.9%. Additionally, recent work by Yazon *et al.* (2024a) highlighted that schools with improved infrastructure saw modest enrollment increases, but retention rates remained challenging without concurrent improvements in teaching quality and community engagement.

### Teacher Competency

#### International Studies

Research from around the world supports the importance of teacher competency. A UNESCO (2023c) report found that teacher quality is one of the top factors influencing both student achievement and school enrollment, especially in developing countries. Similarly, a study by the World Bank (2022) showed that schools with higher teacher competency scores experienced increased student retention and new enrollments, particularly where

teachers received ongoing professional development.

#### Philippine Studies

In the Philippines, several studies echo these findings. The Department of Education's 2023 Basic Education Report highlighted that schools with higher teacher competency ratings (as measured by classroom observations and student feedback) saw improved enrollment and lower dropout rates. A study by Yazon *et al.* (2024c) found that teacher training programs under the K-12 reform led to a 10% increase in student retention in public schools. Meanwhile, the Philippine Institute for Development Studies (2021) noted that teacher competency, when combined with community engagement, significantly boosted both initial enrollment and long-term attendance.

### Infrastructure Development and Teacher Competency

#### International Studies

International research supports these findings. A 2023 study by the World Bank found that school infrastructure improvements had a positive but limited effect on enrollment, and that the effect was much stronger when combined with teacher training and professional development (World Bank, 2023). UNESCO's Global Education Monitoring Report (2022) also emphasizes that while infrastructure is important for access, teacher quality is essential for both attracting and retaining students.

#### Philippine Studies

In the Philippines, the Department of Education's Basic Education Report (2023) noted that schools with both improved facilities and high teacher competency saw the greatest gains in enrollment and retention. Yazon *et al.* (2024) found that teacher training programs under the K-12 reform, when implemented alongside infrastructure upgrades, led to a significant increase in student participation and lower dropout rates. The Philippine Institute for Development Studies (2021) also reported that combined investments in school buildings and teacher development had a greater impact on enrollment than either factor alone.

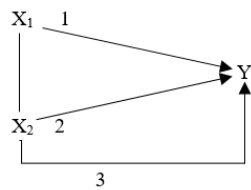
## MATERIALS AND METHODS

The sampling technique used in this research was a purposive sampling technique (random). The population of this research was all teachers from the selected Integrated Schools in the Municipality of Quezon, Bukidnon, namely 140 teachers. The number of samples to be taken is 120 samples. Research design, in this study there are 3 variables, namely, 2 independent variables, Infrastructure Development ( $X_1$ ) and Teacher Competency ( $X_2$ ) as well as 1 dependent variable, namely Enrollment Progress ( $Y$ ).

**Table 1:** Respondent's Profile

| Public Integrated School     | Teacher    |           |     |
|------------------------------|------------|-----------|-----|
|                              | Elementary | Secondary |     |
| Linabo Integrated School     | 8          | 5         | 13  |
| Gamot Integrated School      | 9          | 5         | 14  |
| Cawayan Elementary School    | 8          | 5         | 13  |
| Dilapa Integrated School     | 30         | 12        | 42  |
| San Jose Integrated School   | 32         | 8         | 40  |
| Minsalirac Integrated School | 14         | 4         | 18  |
| Total                        | 101        | 30        | 140 |

The relationship between the three research variables is described as follows:



**Figure 1:** Design of Relationships Between Variables

Information:

1.  $X_1$  = Infrastructure Development
2.  $X_2$  = Teacher Competency
3.  $Y$  = Enrollment Progress

Relationship between variables:

1. The influence of infrastructure development on the enrollment progress.

2. The influence of teacher competency on the enrollment progress.

3. Simultaneous influence of infrastructure development and teacher competency on the enrollment progress.

### RESULTS AND DISCUSSION

The hypothesis test used uses regression testing. The aim of the regression test is to see the influence that the independent variable has on the dependent variable. The regression test used to test the hypothesis in this research is a simple regression test.

#### First Hypothesis Test

Hypothesis testing using SPSS. The first hypothesis test aims to determine the enhancement of infrastructure development on the enrollment progress of public integrated schools of Quezon, Bukidnon.

**Table 2:** Coefficient of Determination of Enrollment Progress and Infrastructure Development

| Model Summary <sup>b</sup> |                   |          |                   |                            |
|----------------------------|-------------------|----------|-------------------|----------------------------|
| Model                      | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1                          | .457 <sup>a</sup> | .209     | .202              | .15127                     |

a. Predictors: (Constant), INFRASTRUCTURE

b. Dependent Variable: ENROLLMENT

#### Discussion of Infrastructure Development's Impact on Enrollment Progress

The model summary table reveals a moderate relationship between infrastructure development and enrollment progress, with an R value of 0.457 and an R Square of 0.209. This coefficient of determination indicates that only 20.9% of the variation in enrollment can be explained by infrastructure development. The adjusted R

Square of 0.202 confirms this finding while accounting for the sample size. This means that while infrastructure does influence enrollment, nearly 80% of enrollment variation is determined by other factors not captured in this model.

#### Implications of the Results

The modest R Square value (0.209) suggests that infrastructure development alone is not sufficient to drive

**Table 3:** Simple Regression of Enrollment Progress and Infrastructure Development

| Coefficients <sup>a</sup> |                |                             |            |                           |        |       |                                 |             |
|---------------------------|----------------|-----------------------------|------------|---------------------------|--------|-------|---------------------------------|-------------|
| Model                     |                | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  | 95.0% Confidence Interval for B |             |
|                           |                | B                           | Std. Error | Beta                      |        |       | Lower Bound                     | Upper Bound |
| 1                         | (Constant)     | 4.052                       | .099       |                           | 41.072 | <.001 | 3.856                           | 4.247       |
|                           | INFRASTRUCTURE | .174                        | .031       | .457                      | 5.586  | <.001 | .112                            | .236        |

a. Dependent Variable: ENROLLMENT PROGRESS

substantial enrollment improvements in public integrated schools. This result indicates that policymakers and school administrators should avoid placing excessive emphasis on infrastructure without addressing other critical factors that may have stronger influences on enrollment. The standard error of the estimate (0.15127) further indicates moderate prediction accuracy, reinforcing that infrastructure development, while beneficial, represents just one piece of a larger puzzle in enhancing enrollment. Schools may need to pursue a more holistic approach that combines infrastructure improvements with other educational quality enhancements.

**Discussion of Infrastructure Development’s Impact on Enrollment Progress**

The simple regression analysis reveals a moderate positive relationship between infrastructure development and enrollment progress in public integrated schools. The unstandardized coefficient (B = 0.174) indicates that for every one-unit increase in infrastructure quality, enrollment progress increases by 0.174 units. This effect is statistically significant (p < 0.001), confirming that infrastructure improvements reliably predict enrollment gains. The standardized coefficient (Beta = 0.457) further supports this moderate positive correlation. The narrow confidence interval (0.112 - 0.236) demonstrates the

consistency of this relationship, though the effect size remains modest. Thus, the enhancement of infrastructure development on the enrollment progress produces a regression equation:  $Y=4.052+0.174X_1$

**Implications of the Results**

The regression results indicate that while infrastructure development significantly influences enrollment progress, its impact is limited in magnitude. With only 20.9% of enrollment variance explained by infrastructure (as shown in the R Square value), the findings suggest that infrastructure improvements alone are insufficient to drive substantial enrollment growth. School administrators and policymakers should recognize that infrastructure represents just one factor among many that affect enrollment decisions. The relatively small coefficient (0.174) suggests that substantial infrastructure investments may yield only modest enrollment gains, indicating the need for complementary strategies beyond physical facilities to meaningfully enhance enrollment.

**Second Hypothesis Test**

The second hypothesis test aims to determine the teacher competency on the enrollment progress of public integrated schools of Quezon, Bukidnon.

**Table 4:** Coefficient of Determination of Enrollment Progress and Teacher Competency

| Model Summary <sup>b</sup> |                   |          |                   |                            |
|----------------------------|-------------------|----------|-------------------|----------------------------|
| Model                      | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1                          | .461 <sup>a</sup> | .213     | .206              | .15092                     |

a. Predictors: (Constant), TEACHER COMPETENCY

b. Dependent Variable: ENROLLMENT PROGRESS

**Discussion of Teacher Competency’s Impact on Enrollment Progress**

The model summary for the relationship between teacher competency and enrollment progress shows an R value of 0.461 and an R Square of 0.213. This means that 21.3% of the variance in enrollment progress can be explained by teacher competency alone. The adjusted R Square (0.206) is very close to the R Square, indicating the model is stable and not overfitted. The standard error of the estimate is 0.15092, which suggests a moderate level of accuracy in predicting enrollment progress based on teacher competency.

**Implications of the Results**

The results show that teacher competency has a statistically significant and meaningful impact on enrollment progress in public integrated schools. However, the effect is moderate, explaining just over one-fifth of the variation in enrollment. This suggests that while teacher competency is important-likely influencing parents’ and students’ decisions to attend or stay in a school, it is not the only factor at play. Other elements, such as infrastructure, community support, and socioeconomic conditions, also contribute to enrollment trends. For school leaders and policymakers, this means that investing in teacher training

**Table 5:** Simple Regression of Enrollment Progress and Teacher Competency

| Coefficients <sup>a</sup> |                    |                             |            |                           |        |       |                                 |             |
|---------------------------|--------------------|-----------------------------|------------|---------------------------|--------|-------|---------------------------------|-------------|
| Model                     |                    | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  | 95.0% Confidence Interval for B |             |
|                           |                    | B                           | Std. Error | Beta                      |        |       | Lower Bound                     | Upper Bound |
| 1                         | (Constant)         | 3.041                       | .276       |                           | 11.021 | <.001 | 2.495                           | 3.588       |
|                           | TEACHER COMPETENCY | .350                        | .062       | .461                      | 5.647  | <.001 | .227                            | .472        |

a. Dependent Variable: ENROLLMENT PROGRESS

and professional development is essential, but it should be part of a broader, more holistic strategy to improve enrollment.

**Discussion of Teacher Competency’s Impact on Enrollment Progress**

The regression table shows that teacher competency has a statistically significant positive effect on enrollment progress. The unstandardized coefficient ( $B = 0.350$ ) means that for every one-unit increase in teacher competency, enrollment progress increases by 0.35 units. The standardized coefficient ( $Beta = 0.461$ ) indicates a moderate positive relationship. The t-value (5.647) is high, and the p-value is less than 0.001, confirming that the relationship is statistically significant. The 95% confidence interval for B (0.227 to 0.472) does not include zero, adding further confidence to the result. Thus, the influence of teacher competence on the quality of education produces a regression equation:  $Y=3.041+0.350X_2$

**Implications of the Results**

This result means that improving teacher competency can lead to better enrollment progress in public integrated schools. However, the Beta value of 0.461 and the R Square value from the model summary (about 21.3%) suggest that teacher competency is important, but it is not the only factor influencing enrollment. Other elements, such as infrastructure, school leadership, community support, and socioeconomic conditions, also play significant roles. For policymakers and school leaders, this finding highlights the value of investing in teacher training and professional development as part of a broader strategy to boost school enrollment.

**Third Hypothesis Test**

Simultaneous infrastructure development and teacher competency on the enrollment progress of public integrated schools in the Municipality of Quezon, Bukidnon. This third hypothesis test uses  $X_1$  and regression  $X_2$  simultaneously with Y. In this regression

**Table 6:** Coefficient of Determination, Infrastructure Development and Teacher Competency on Enrollment Progress.

| Model Summary <sup>e</sup> |                   |          |                   |                            |
|----------------------------|-------------------|----------|-------------------|----------------------------|
| Model                      | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1                          | .457 <sup>a</sup> | .209     | .202              | .15127                     |
| 2                          | .615 <sup>b</sup> | .378     | .367              | .13476                     |

a. Predictors: (Constant), INFRASTRUCTURE

b. Predictors: (Constant), INFRASTRUCTURE, TEACHER COMPETENCY

c. Dependent Variable: ENROLLMENT PROGRESS

test the variables of infrastructure development and teacher competency are independent variables, the variable of enrollment progress is the dependent variable.

**Discussion of Infrastructure Development and Teacher Competency’s Impact on Enrollment Progress**

The regression model summary table shows the relationship between infrastructure development, teacher competency, and enrollment progress. In Model 1, where only infrastructure is considered, the R Square is 0.209. This means that 20.9% of the variation in enrollment progress can be explained by infrastructure alone. In Model 2, when both infrastructure and teacher competency are included, the R Square increases to 0.378. This means that 37.8% of the variation in enrollment progress can be explained when both factors are considered together. The adjusted R Square also rises from 0.202 to 0.367, indicating that the model’s improvement is not just due to adding more variables, but that teacher competency genuinely adds explanatory power. The increase in R Square from 0.209 to 0.378 shows

that teacher competency makes a substantial additional contribution to explaining enrollment progress, beyond what infrastructure alone can account for. The standard error of the estimate also decreases from 0.15127 to 0.13476, indicating that the predictions of enrollment progress become more accurate when both variables are included.

**Implications of the Results**

These results mean that both infrastructure development and teacher competency are important for improving enrollment progress in public schools. Infrastructure alone has a moderate effect, but when combined with teacher competency, the impact is much greater. This suggests that simply building or upgrading school facilities is not enough; schools also need competent and well-trained teachers to truly boost enrollment. For policymakers and school leaders, this highlights the importance of a balanced approach-investing in both physical resources and human capital-to achieve the best results in increasing school enrollment.

**Table 7:** Multiple Regression, Infrastructure Development and Teacher Competency on Enrollment Progress.

| Model |                | Coefficients <sup>a</sup>   |            |                           |        |       |                                 |             |
|-------|----------------|-----------------------------|------------|---------------------------|--------|-------|---------------------------------|-------------|
|       |                | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  | 95.0% Confidence Interval for B |             |
|       |                | B                           | Std. Error | Beta                      |        |       | Lower Bound                     | Upper Bound |
| 1     | (Constant)     | 4.052                       | .099       |                           | 41.072 | <.001 | 3.856                           | 4.247       |
|       | INFRASTRUCTURE | .174                        | .031       | .457                      | 5.586  | <.001 | .112                            | .236        |
| 2     | (Constant)     | 2.715                       | .253       |                           | 10.719 | <.001 | 2.213                           | 3.216       |
|       | INFRASTRUCTURE | .156                        | .028       | .409                      | 5.569  | <.001 | .100                            | .211        |
|       | COMPETENCY     | .313                        | .056       | .413                      | 5.630  | <.001 | .203                            | .423        |

a. *Dependent Variable: ENROLLMENT PROGRESS*

**Discussion of Infrastructure Development and Teacher Competency's Impact on Enrollment Progress**

The multiple regression results show the effects of both infrastructure development and teacher competency on enrollment progress in public schools. In the first model, where only infrastructure is included, the standardized coefficient (Beta) for infrastructure is 0.413 and is statistically significant ( $p < .001$ ), meaning infrastructure alone has a moderate positive effect on enrollment. The unstandardized coefficient ( $B = 0.174$ ) tells us that for every one-unit increase in infrastructure, enrollment increases by 0.174 units. The resulting regression equation is:  $Y = 2.715 + 0.156X_1 + 0.313X_2$

When both infrastructure and teacher competency are included in the second model, the standardized coefficients are 0.409 for infrastructure and 0.413 for teacher competency, both statistically significant ( $p < .001$ ). This means that both factors independently and positively contribute to enrollment progress. The

unstandardized coefficients ( $B = 0.156$  for infrastructure and  $B = 0.313$  for teacher competency) indicate that both variables have meaningful, additive effects on enrollment. The confidence intervals for both predictors do not include zero, further confirming their significance.

**Implications of the Results**

These results show that infrastructure development and teacher competency each play important and roughly equal roles in improving school enrollment. The findings suggest that schools and policymakers should not rely solely on building new facilities or upgrading infrastructure; they must also focus on improving teacher skills and professional development. The combined approach leads to greater gains in enrollment than focusing on either factor alone. This balanced investment is likely to create a more attractive and effective learning environment, encouraging more families to enroll and keep their children in school.

**Table 8:** ANOVA of Enrollment Progress, Infrastructure development and teacher competency

| ANOVA <sup>a</sup> |            |                |     |             |        |       |
|--------------------|------------|----------------|-----|-------------|--------|-------|
| Model              |            | Sum of Squares | df  | Mean Square | F      | Sig.  |
| 1                  | Regression | .714           | 1   | .714        | 31.205 | .000b |
|                    | Residual   | 2.700          | 118 | .023        |        |       |
|                    | Total      | 3.414          | 119 |             |        |       |
| 2                  | Regression | 1.290          | 2   | .645        | 35.509 | .000c |
|                    | Residual   | 2.125          | 117 | .018        |        |       |
|                    | Total      | 3.414          | 119 |             |        |       |

a. *Dependent Variable: ENROLLMENT*

b. *Predictors: (Constant), INFRASTRUCTURE*

c. *Predictors: (Constant), INFRASTRUCTURE, COMPETENCY*

**Discussion of Infrastructure Development and Teacher Competency's Impact on Enrollment Progress**

The ANOVA table presents the results of two regression models examining the effects of infrastructure development and teacher competency on enrollment progress:

- Model 1 (Infrastructure only): The F-value is 31.205 with a significance level of  $p < 0.001$ . This means that

infrastructure development alone has a statistically significant effect on enrollment progress. The regression explains a meaningful portion of the variance in enrollment (as supported by the  $R^2$  value of 0.209 from the model summary).

- (Infrastructure and Teacher Competency): The F-value increases to 35.509 with a significance level of  $p < 0.001$ . This model, which includes both infrastructure

and teacher competency, explains even more variance in enrollment progress, as reflected by the higher  $R^2$  value (0.378). The decrease in residual mean square (from 0.023 to 0.018) also indicates that the model fits the data better when both predictors are included.

These results confirm that both infrastructure development and teacher competency significantly contribute to explaining changes in enrollment progress. The improvement in the model when both factors are considered together demonstrates their combined importance.

### Implications of the Results

The findings suggest that improving school infrastructure and enhancing teacher competency are both effective strategies for increasing enrollment in public schools. However, the results also show that neither factor alone is enough for maximum impact. The best outcomes are achieved when investments are made in both areas. For education leaders and policymakers, this means that efforts to boost enrollment should be holistic-upgrading facilities and providing ongoing teacher training and support at the same time.

### CONCLUSION

The coefficient of determination on enrollment progress and infrastructure development of (20.9%) indicates that infrastructure development makes a meaningful but limited contribution to enrollment progress in public integrated schools. This finding suggests the need for comprehensive educational improvement strategies that address multiple factors simultaneously. School leaders and policymakers should view infrastructure as one component within a broader framework that includes teacher development, curriculum enhancement, community engagement, and addressing socioeconomic barriers to education. While teacher competency is a driver of enrollment of progress in public integrated schools, explaining about 21.3% of the variation in enrollment. This underscores the need for ongoing investments in teacher training and professional development. However, to maximize enrollment gains, these effort should be integrated with improvements in infrastructure, community involvement, and support for students' broader need. By combining infrastructure development and teacher competency on enrollment progress the analysis shows that infrastructure development and teacher competency together explain a much larger portion of enrollment progress than infrastructure alone with a combine coefficient of determination of (37.8%). This highlights the need for integrated strategies that improve both school facilities and teacher quality. For lasting improvements in enrollment, policymakers should

ensure that investments in infrastructure are matched by efforts to develop and support competent teachers.

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