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An empirical study on educational development and gaps in Satakha Town Nagaland

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Abstract

This research analyzes at the situation of education in Satakha, a rural district in Nagaland, focusing on both improvement and persisting issues. A integrated- methods approach was used to collect data from 115 respondents, who included students, teachers, and parents. The study uses descriptive statistics and regression analysis to investigate how infrastructure and teacher engagement influence student satisfaction.

The outcomes indicate that inadequate access to basic facilities and a lack of interactive teaching approaches continue to have an impact on learning results. These trends were vividly shown using visual tools such as charts and tables. While the study is specific to Satakha, the difficulties raised are representative of broader challenges experienced by rural schools in similar situations. The study advises strengthening infrastructure, boosting teacher training, actively engaging the com- munity, and making education more relevant to the local environment.

Keywords: Rural Education; Student Satisfaction; Educational Infrastructure; Teacher Engagement; Tribal Areas; Northeast India; Educational Development

1. Introduction

Education is commonly alluded to as the foundation of development, but what that entails on the ground, particularly in rural and tribal communities, differs significantly from policy documents. Satakha, a subdivision set in the hills of Nagaland, is one such location where schools exist, but many of the elements that make learning effective are still unbalanced.

While the government and even a few NGOs have tried to improve access to education in such areas, problems like poor infrastructure, shortage of trained teachers, and lack of community involvement still remain (Ministry of Education, Government of India, 2020, 2022). Some schools lack adequate toilet facilities or basic equipment such as textbooks and functional lights. Teachers generally do their best, but many have not had adequate professional training or support. Despite these challenges, it is obvious that the society values education and wants greater prospects for future generations.

This study started from a desire to move beyond numbers and official documents. Instead of focusing solely on state-level statistics, it explores into what individuals in Satakha actually encounter—what students think of their schools, how parents become concerned, and what teachers endure on a daily basis. It's about capturing those voices and using them to figure out what parts of the education system are working and which need to be improved.

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Using a combination of survey responses, observations, and a simple regression model, this study attempts to connect the connections between infrastructure, teacher practices, and student pleasure. The goal is not to criticize, but to learn—so that future attempts are more informed by what is actually happening on the ground.

2. Literature Review

The state of education in rural India has been the subject of much intellectual and policy debate over the years. One issue that keeps coming up is the wide gap between school enrollment and actual learning. Many children are now attending school, but this does not always imply that they are learning effectively or that their surroundings are promoting their development. Low-fee private schools in rural areas sometimes fill gaps left by struggling government schools, according to studies. (Srivastava, 2013)

National surveys (ASER Centre, 2005), show that even after years of schooling, children still struggle with fundamental reading and math skills. The study Banerjee et al. (2010) argue that just getting students into schools isn't enough—we need to focus more on what's happening inside the classroom. Likewise, Kingdon (2007) and Kremer et al. (2005) have pointed out that teacher absenteeism, lack of motivation, and limited training are major challenges, particularly in distant or underprivileged locations.

When it comes to the Northeast, things get even more complicated. Areas like Nagaland face unique cultural and geographical challenges. For example, Ao (2012) talks about how many schools in Nagaland operate in isolation, with minimal supervision or community input. Jamir and Longkumer (2015) also notes that when tribal identity and cultural values are not reflected in the school system, students tend to feel disconnected or uninterested.

Language is also an essential consideration. In multilingual communities, the medium of instruction itself might be an issue. Chophy (2018) shows that students often find it hard to understand lessons when the language used in school isn't what they speak at home. Even with the necessary infrastructure in place, this can result in low confidence and poor learning outcomes.

Gender is another area where gaps exist. Dropouts are frequently caused by institutional exclusion or neglect, as well as poverty or lack of access to resources (Reddy & Sinha, 2010). According to Borkotoky and Borah (2020) study in nearby Assam, a lack of separate bathrooms for girls and safety concerns can result in increased dropout rates. Even though these challenges are well-known, they have yet to be fully handled in many rural areas of India, including Nagaland.

Fortunately, many academics have questioned whether these improvements will actually result in inclusive outcomes in profoundly uneven situations. According to (Jha & Parvati, 2010) despite recommendations such as the National Education Policy 2020 promising significant reforms, their implementation has been incomplete. Older findings in research, such as Ramachandran (2004) and The PROBE Team (1999), teach us that unless everyday experiences—like teacher conduct, classroom atmosphere, and parental support—are treated seriously, reforms may fail to produce the desired output.

This work builds on that foundation while focusing on Satakha, a topic that has received little attention in research. By hearing directly from individuals who are part of the system—students, instructors, and parents—it attempts to provide a more grounded, real-world view on what educational development looks like in an area that is sometimes left out of the broader dialogue. Global reports have also emphasized that inclusive education is a worldwide challenge, not just an Indian one. (Bank, 2021; UNESCO, 2020)

2.1. Objectives of the Study

The primary goal of this study was to look more closely at how education works in Satakha—not just on paper, but also in practice. There has been a lot of talk about improving rural education, but each location faces unique problems. This research focused exclusively on Satakha to better understand what is going on there.

Here are the main objectives the study:

- To analyze the present state of educational infrastructure in schools in Satakha.
- To understand how students, teachers, and parents feel about the quality of education being provided.
- To find out whether things like infrastructure and teacher involvement have a clear effect on how satisfied students are with their schooling.

- To highlight the main gaps that still exist and suggest areas where improvements can be made based on what the local community actually needs.

3. The Research Methodology

The study took a simple and practical approach. Because the goal was to learn more about what is going on in Satakha schools, the majority of the information came from the people who are directly involved—students, teachers, and their parents.

3.1. Study Area and Respondents

The study was conducted in Satakha town, a subdivision located in Zunheboto District of Nagaland. It's mostly rural, with schools spread across hilly terrain and often lacking in basic resources. A total of 115 people participated in the survey:

- 70 were students studying in local government schools,
- 20 were teachers working at those schools, and
- 25 were parents of school-going children.

3.2. Sampling and Data Collection

The sample size was calculated using Cochran's formula to keep things statistically sound while still manageable. A mix of simple random and cluster sampling was used to select the respondents. Structured questionnaires were used to collect data—these included both multiple-choice questions and 5-point Likert scale items. The questionnaire covered areas like availability of school facilities, teaching practices, and student satisfaction.

3.3. Tools and Analysis

The data was studied and analyzed using Python 3.13, particularly with libraries like pandas, seaborn, and statsmodels. Descriptive statistics were utilized to summarize responses, and a simple linear regression model was run to see how much infrastructure and teacher engagement influenced student satisfaction.

Here's the basic regression model that was used:

$$\text{StudentSatisfaction}_i = \beta_0 + \beta_1 \cdot \text{Infrastructure}_i + \beta_2 \cdot \text{TeacherEngagement}_i + \epsilon_i \tag{1}$$

3.4. Variables

- *StudentSatisfaction*: a composite score based on responses to questions about teaching, feedback, and school experience.
- *Infrastructure*: measured using access to sanitation, internet, and classroom facilities.
- *TeacherEngagement*: based on whether teachers used interactive methods and how often they attended training.

3.5. Reliability

The questionnaire's internal consistency was tested using Cronbach's Alpha. The score came out to be around 0.50, which, although slightly below the usual threshold of 0.60, is acceptable for exploratory research, especially in rural settings where uniformity in understanding and interpretation may vary.

4. Findings and Interpretation

This section discusses what the data actually revealed, based on the responses from students, parents, and teachers in Satakha. The idea was to go beyond assumptions and get a clearer understanding of how people feel about their educational environment.

4.1. Descriptive Insights

Beginning with the students, many expressed varied opinions about their educational experience. On a 5-point scale, the majority of students ranked their happiness between 2 and 3. A closer look at the figures revealed that the average satisfaction score was around 2.3, indicating that, although not bad, things are certainly not where they should be.

Basic facilities like toilets and computer labs were either unavailable or not functional in several schools. Only about one-third of the students confirmed having regular access to sanitation, and even fewer had internet or digital learning tools. This is consistent with the infrastructure scores, which also averaged below 3.

Teachers, on their part, admitted that although they try to engage students, many of them haven't received proper training in interactive teaching methods. The average score for teacher engagement was around 2.5, based on how often they used group work, discussions, or creative activities in class.

Table 1 Descriptive Statistics of Student Responses

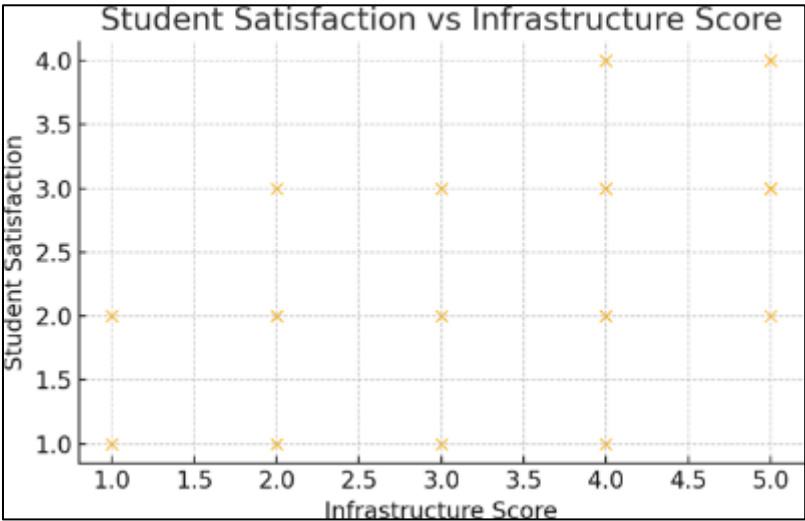|	Infrastructure	Teacher Engagement	Student Satisfaction
count	70.00	70.00	70.00
mean	3.19	3.06	2.31
std	1.30	1.49	0.91
min	1.00	1.00	1.00
25%	2.00	2.00	2.00
50%	3.00	3.00	2.00
75%	4.00	4.00	3.00
max	5.00	5.00	4.00

Figure 1 Student Satisfaction vs. Infrastructure Score

The graph above shows a fairly clear trend: students tend to be more satisfied when infrastructure is better. While not a perfect line, the relationship is strong enough to suggest that the physical environment does matter.
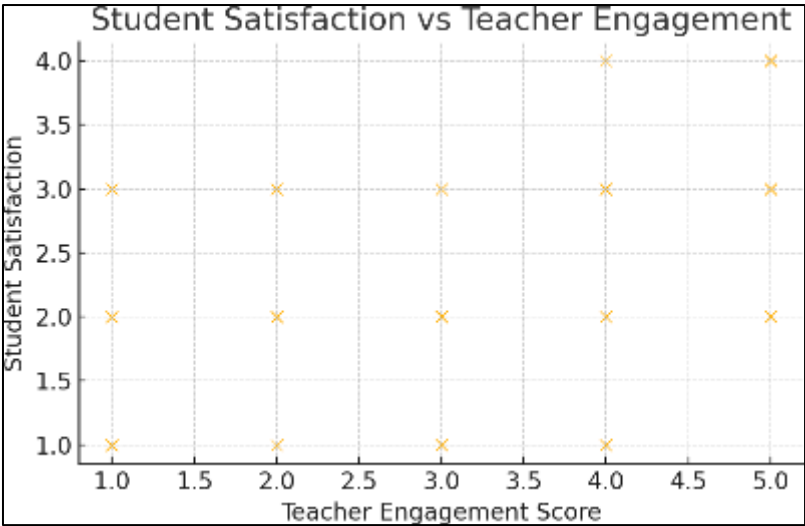
Figure 2 Student Satisfaction vs. Teacher Engagement

Similarly, the scatter plot above shows that teacher involvement—especially in how they conduct lessons—also plays a big role in shaping how students feel about school. When teachers used more engaging methods, satisfaction scores were noticeably higher.
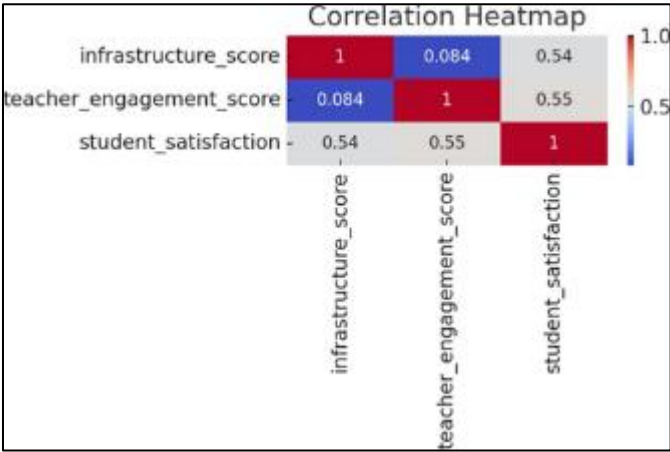

Figure 3 Correlation Heatmap of Key Variables

The correlation heatmap highlights how student satisfaction is positively correlated with both infrastructure and teacher engagement. Though this doesn't prove causation, it does strengthen the case that these two variables are worth investing in.

4.2. Regression Results

To test these relationships more formally, a simple linear regression was run with student satisfaction as the dependent variable. The results are summarized below:

Table 2 OLS Regression Results for Student Satisfaction

Variable	Coefficient	Std. Error	t-Statistic	p-value
Constant	0.259	0.241	1.08	0.286
Infrastructure Score	0.347	0.058	6.01	0.000
Teacher Engagement Score	0.311	0.050	6.20	0.000

R-squared = 0.549   Adjusted R-squared = 0.535   Observations = 70

The regression output back up what we observed in the graphs. Both infrastructure and teacher engagement are statistically significant, with p-values well below 0.05. The R-squared value of about 0.55 means that more than half of the variation in student satisfaction can be explained by these two factors alone.

It can be concluded that when schools have decent facilities and teachers are more involved, students are much more likely to feel positive about their education.

4.3. Graphical Analysis

In addition to the regression and correlation analysis, some basic graphical analysis were created to further show the trends in the data structure.
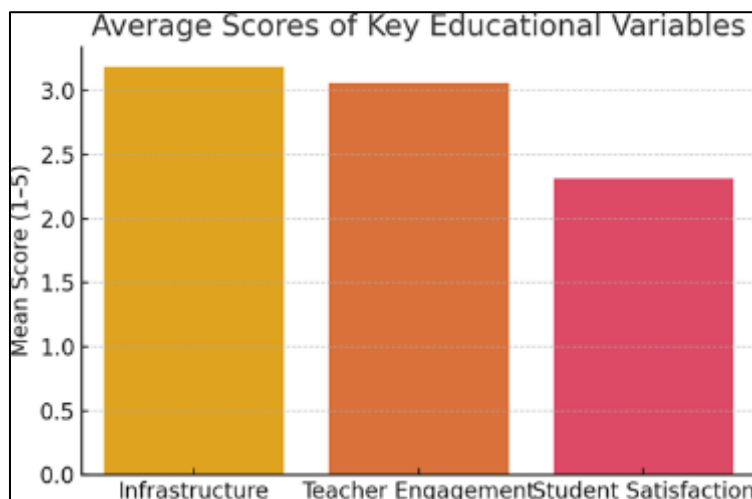

Figure 4 Average Scores of Key Educational Variables

Figure 4 shows that on average, teacher engagement and infrastructure scores hover around the mid-point, reflecting moderate levels of satisfaction and provision.
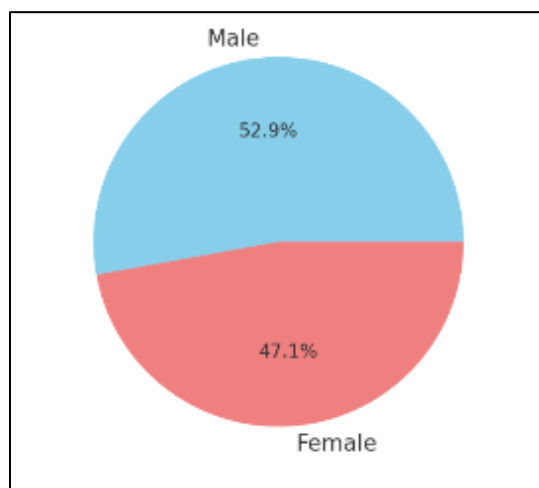

Figure 5 Gender Distribution of Student Respondents

The pie chart in Figure 5 illustrates the gender split among the students surveyed. A slightly higher proportion of male respondents was recorded, though both groups were fairly balanced.
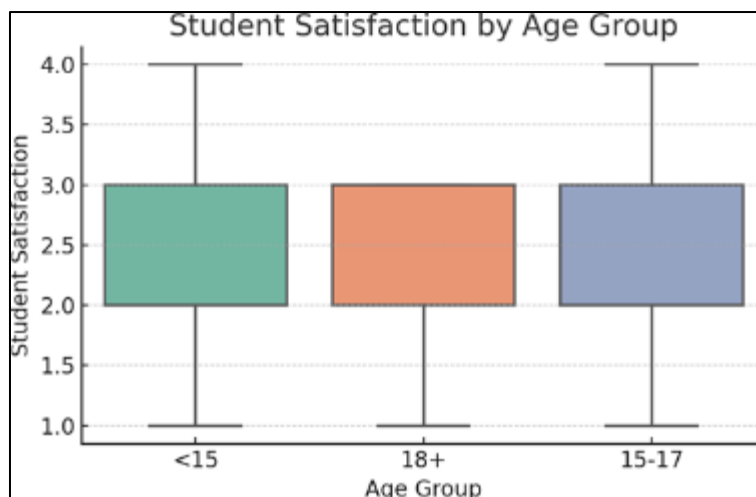
Figure 6 Student Satisfaction by Age Group

Figure 6 states understanding into how student satisfaction levels vary across different age groups. It appears that slightly older students report more consistent satisfaction levels, probably due to maturity or adjusted expectations.

5. Conclusion and Policy Recommendations

This study aimed to determine the true state of education in Satakha, and the findings indicate that, while some progress has been made, there are still significant gaps. Student satisfaction was closely related to the quality of infrastructure and instructor engagement. These two locations were mentioned repeatedly in responses, both numerically and in terms of observations.

Based on what the data suggests, a few key steps could help improve things:

- Improve basic infrastructure—especially sanitation, electricity, and internet access.
- Offer regular, localized teacher training that supports interactive and inclusive teaching.
- Encourage more community involvement in school functioning and decision-making.
- Make school environments more culturally and linguistically relevant for tribal students.
- This study highlights some very real issues that deserve attention. If local voices are heard and small, practical changes are made, rural education in places like Satakha could move in a more positive direction.

5.1. Limitations and Scope for Future Research

Although the research provides some fascinating information about the state of education in Satakha, there are a few drawbacks that should be noted. These do not diminish the significance of the findings, but they do highlight areas where future research should expand and study deeper.

Initially in spite of careful selection, the sample size remained very small. With 115 respondents, the study provides a strong starting point, although it may not cover every variance between schools or localities. A larger and more diversified sample size may provide a more accurate picture, especially if future research includes private schools or dropouts.

Second, the majority of the data was self-reported. While efforts were made to keep the questions neutral and clear, there is always the possibility that responses reflect what people believe researchers want to hear or wish were true. More field observations, classroom visits, and third-party inspections would improve future analyses.

Third, the study targeted three groups: students, teachers, and parents. However, other involved parties, such as local education officers, school management committee members, or even peer students, may provide more perspective. It would also be attractive to investigate how gender, caste, and socioeconomic status affect educational experiences further.

Finally, the study focused just on government schools in one neighborhood. While the restricted emphasis helped keep things manageable and specific, future research might examine situations across numerous districts, or even states, to identify what patterns continue and where local context makes a significant difference.

In terms of future study, there is much of opportunity to investigate how digital education tools are used (or not used) in rural regions such as Satakha, particularly following the COVID-19 pandemic. Studies could also look at the long-term impact of enhanced infrastructure or focused teacher training programs to see if they result in significant changes in academic results throughout the years.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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