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THE IMPACT OF CLASSROOM INTERACTION ON THE ACADEMIC ACHIEVEMENT OF ELEMENTARY SCHOOL STUDENTS: A CASE STUDY OF BALASORE DISTRICT

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ABSTRACT

Effective pedagogical engagement serves as the fundamental bridge between instructional effort and learner outcomes, yet the empirical link between specific interaction patterns and academic success often remains under-examined. This study investigates how verbal and non-verbal classroom interaction affects the academic achievement of students within the Indian elementary education system by studying the correlation between classroom interaction patterns and the academic achievement of secondary school students. Utilizing a **descriptive survey research design**, the study sampled **10 elementary schools** in the Remuna Block of the **Balasore district**, involving **200 students and 20 teachers**. Data were collected through structured teacher and student questionnaires alongside an analysis of half-yearly Science examination records.

The findings reveal that while general classroom climate and instructional clarity scored high (over 90%), a significant gap exists in **participatory depth** and **non-verbal communication cues**, where student perceptions lagged teacher self-assessments. Statistical analysis demonstrates a **direct positive correlation** between healthy interaction practices and academic outcomes; schools maintaining interaction scores above **82%** consistently produced higher rates of "Good" academic performance (70–80%), whereas schools with lower interaction metrics saw a marked increase in "Average" and "Below Average" learners.

The study concludes that classroom interaction is a measurable determinant of success, serving as a critical bridge between instructional effort and learner outcomes. Recommendations include a pedagogical shift toward **indirect teaching methods**, increased student-led decision-making, and professional development focused on enhancing participatory depth to optimize the learning ecosystem.

Keywords: Classroom Interaction; Academic Achievement; Teacher-Student Relationship (STR); Elementary Education; Balasore District; Pedagogical Engagement.

1.1 INTRODUCTION

The calibre of a nation's development is inextricably linked to the quality of its teaching force. As the primary agents of social change, teachers manage the instructional activities that determine the destiny of learners and, by extension, the state. This responsibility is measured primarily through student academic performance, which research indicates is heavily influenced by the teacher-student relationship (Eschemann, 1999; Whitaker, 2004).

A critical correlation exists between a teacher's perceptions and their classroom actions. Positive teacher expectations are associated with significant academic gains, while negative

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expectations frequently result in performance declines (Tyler & Boelter, 2008). Therefore, educators must cultivate learning environments that prioritize both academic and emotional needs through healthy interaction—encompassing constructive feedback, approachable instruction, and inclusive classroom cultures.

Despite numerous Indian policies aimed at universalizing education and increasing enrolment, the quality of learning outcomes remains below expectations. A primary contributor to this failure is the lack of productive classroom interaction. Current pedagogical gaps in teacher-student engagement represent a major drawback in the national education system.

Definition -Classroom interaction comprises all verbal and non-verbal communication, including two-way teacher-student engagement and peer-to-peer interaction. Beyond formal instruction, effective interaction involves biased-free, affectionate behavior and mentorship regarding life values. These practices are essential for fostering student motivation, psychological health, and long-term academic success.

1.2 Significance of the study

This study aims to bridge the gap between theoretical classroom interaction and practical academic outcomes. Its significance is rooted in three primary areas:

- **Holistic Student Development:** Beyond academic achievement, effective classroom interaction is critical for the psychological well-being, character formation, and personality development of secondary school students.
- **Counteracting External Negative Variables:** Students are constantly influenced by a "summation of forces"—including socio-economic status, home environment, and peer pressure—that may pull them away from educational objectives. This research highlights the teacher's role as a corrective motivational force, capable of pivoting these influences toward successful learning outcomes.
- **Practical Application for Educators:** By demonstrating the empirical link between interaction and achievement, this study provides the educational community with actionable insights. The findings are intended to refine classroom practices, move toward higher-quality instruction, and contribute to the existing body of knowledge regarding the impact of positive teacher-student relationships.

1.3 Statement of the Problem

While the primary purpose of education is socialization, the classroom remains the critical platform for developing essential critical thinking, listening, and speaking skills. Effective classroom interaction is the mechanism that enables this development. However, current literature suggests a systemic failure—a "state of emergency"—in how these interactions are facilitated, leading to suboptimal educational outcomes.

Despite the recognized importance of teacher-student engagement, there is a lack of empirical clarity regarding its direct impact on final academic results within the current school system. Without addressing this gap, efforts to improve educational quality remain speculative. Therefore, this study investigates the specific effect of classroom interaction on the academic achievement of secondary school students to provide a data-driven basis for pedagogical reform.

ISSN: 2249-040X
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1.4 Objectives of the Study

The primary aim of this research is to evaluate the correlation between pedagogical engagement and student outcomes. Specifically, the study seeks:

1. **To Identify Existing Practices:** To document the prevailing verbal and non-verbal classroom interaction patterns within elementary schools.
2. **To Analyse Comparative Achievement:** To evaluate student academic scores across diverse school environments to determine the statistical impact of "healthy interaction" on performance.
3. **To Propose Pedagogical Frameworks:** To identify and recommend evidence-based interaction strategies that optimize the learning environment in elementary education.

1.5 Research Questions

To achieve the study's objectives, the following questions are addressed:

1. What specific classroom interaction practices are currently prevalent in elementary schools?
2. To what extent do academic achievement levels vary across different elementary school environments?
3. What is the measurable impact of these interaction practices on students' academic performance?

1.6 Scope and Delimitations

While the relationship between classroom interaction and student achievement is a national priority under flagship educational programs, the logistical constraints of a comprehensive national study necessitate a focused approach. This research serves as a representative sample study, focusing on the following parameters:

- **Geographic Focus:** The study is delimited to the **Balasore district**.
- **Participant Sample:** The research involves **200 students** and **20 teachers** across **10 elementary schools**.
- **Constraints:** Due to time and resource limitations, the study does not provide a comparative analysis between urban and rural settings, nor does it track longitudinal performance. It focuses on providing an empirical "snapshot" of the current pedagogical climate and its immediate academic correlations.

2.1 REVIEW OF RELATED LITERATURE

The correlation between classroom interaction and student achievement is well-documented, shifting the focus of educational research from what teachers *are* to what teachers *do* (Bloom, 1980). This review categorizes existing literature into three pivotal themes: the nature of interaction, the impact of teacher-student relationships (STR), and the resulting academic outcomes.

2.1.1 The Nature of Classroom Interaction

Research emphasizes the importance of direct observation over mere antecedent study (Medley & Mitzel, 1963). A common pattern identified is Flanders' (1970) **"Rule of Two-Thirds,"** which observes that in most classrooms, someone is talking two-thirds of the time, and two-thirds of that time, it is the teacher.

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However, studies show that "direct" teaching—primarily lecturing and factual transmission—often limits student participation (Walker, 2008). In contrast, **indirect teaching styles**, characterized by the acceptance of student ideas and active participation, are positively correlated with higher achievement scores, increased curiosity, and superior critical thinking skills (Flanders, 1970; Bressaux, 2000).

2.1.2 Teacher-Student Relationships (STR) and Motivation

The quality of STR is a dynamic factor across all socio-economic backgrounds (Knoell, 2012). Drawing on **Attachment Theory**, positive STRs provide the emotional scaffolding necessary for students to feel secure, which is a prerequisite for academic risk-taking (Baker et al., 2008).

Positive Expectations: Tyler and Boelter (2008) found that teacher expectations act as a self-fulfilling prophecy; positive beliefs yield academic gains, while negative perceptions correlate with performance decline.

Connectedness: Students who feel a sense of connectedness are more likely to seek help and persist through difficult tasks to maintain the supportive bond with the educator (Stipek, 2005; Hoge, 2007).

2.1.3 Empirical Links to Academic Achievement

Consistent evidence across primary, secondary, and even higher education settings suggests that STR affects long-term academic trajectories (Cataldi & KewalRamani, 2009).

Time on Task: Fennema and Peterson (1985) noted that the time students spend engaged in academic learning—directly influenced by teacher interaction—is the strongest predictor of test scores.

Teacher Proximity: Utilizing the *Questionnaire on Teacher Interaction* (QTI), Wubbels and Brekelmans (2005) identified that high student outcomes are characterized by a high degree of teacher influence combined with interpersonal proximity.

Ultimately, while teacher characteristics like years of service play a role, the **quality of communication and the balance between direct/indirect instruction** remain the most significant predictors of student success (Bressaux, 2000; Hagenauer & Volet, 2014).

3.1 RESEARCH DESIGN AND METHOD

This study employs a **Descriptive Survey Research Design**. This method was selected as it allows for the systematic collection of data regarding prevailing classroom interaction practices and their correlation with academic outcomes within a specific geographic context.

3.2 Population and Sampling

The target population comprises **269 elementary schools** across 17 clusters in the Remuna Block. Due to logistical constraints, a **Simple Random Sampling** technique was utilized to select the following participants:

- **Schools:** 10 elementary schools (representing diverse regions of the block).
- **Teachers:** 20 educators (2 per school).
- **Students:** 200 learners (20 per school).

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3.3 Research Tools

The investigator developed two distinct, structured **Questionnaires** to assess classroom interaction:

1. **Teacher Self-Questionnaire:** 30 items focusing on pedagogical approach and interaction frequency.
2. **Student Questionnaire:** 30 items gauging learners' perceptions of teacher engagement and classroom climate.

3.4 Data Collection Procedure

Data was collected through a three-phase process:

- **Institutional Access:** Approval and rapport were established with school administrators in the Remuna Block.
- **Administration:** The researcher personally administered the questionnaires to ensure a 100% response rate and to provide clarifications to participants.
- **Academic Records:** Current academic scores were obtained from school records to facilitate the correlation analysis between interaction and achievement.

3.5 Statistical Technique

To interpret the findings, the study employed **Descriptive Statistics**. Data from the questionnaires were tabulated and analyzed using **simple percentage calculations**. This allowed for a clear comparison between interaction types (direct vs. indirect) and the resulting academic performance levels.

4.1 DATA ANALYSIS AND INTERPRETATION

This chapter analyzes the relationship between classroom interaction and academic achievement through three lenses: (A) Prevalence of interaction practices, (B) Student academic performance, and (C) The correlation between interaction and achievement.

4.1 Section A: Classroom Interaction Profiles

Data from the 30-item questionnaire was grouped into four thematic areas to assess the quality of teacher-student engagement. The table below summarizes the mean positive responses from both cohorts.

Table 1: Thematic Summary of Interaction Practices (Mean %)

Theme	Key Indicators	| Student Mean	Teacher Mean
Classroom Climate	Smiling face, enthusiasm, emotional control	92.8%	96.2%
Instructional Clarity	Simple explanations, prompting, re-teaching	90.1%	86.6%
Participatory Depth	Free discussion, admitting flaws, peer correction	| 60.0%	68.3%
|**Inclusivity & Support**	Physical help (projects), non-verbal cues, motivation	68.3%	82.5%

Key Findings: While general classroom climate and clarity scored exceptionally high (>90%), **Participatory Depth** (allowing disagreements and admitting flaws) scored

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significantly lower. A notable discrepancy exists in **non-verbal interaction** (Students: 42% vs. Teachers: 70%), suggesting teachers believe they are communicating more through cues than students perceive.

4.2 Section B: Academic Achievement (Science)

Academic performance was assessed using Science scores from the 2020 half-yearly examination (Full Marks: 100). Scores were categorized as: *Below Average (0-40), Average (40-60), and Good (60-100).*

Across the 10 sample schools, achievement varied significantly. Schools 3, 4, and 5 exhibited the highest performance, with **75% to 80%** of students falling in the "Good" category. Conversely, Schools 2 and 10 showed higher concentrations of "Average" and "Below Average" learners.

4.3 Section C: Correlation of Interaction and Achievement

To address the primary research question, the mean interaction scores were compared against the percentage of "Good" academic performers in each school.

Table 2: Impact of Interaction on Academic Performance

School	Mean Interaction Score (%)	Students with "Good" Scores (%)
School 1	80.41	50
School 2	82.08	70
School 3	82.50	75
School 4	82.00 |	75
School 5	86.08	80
School 6	80.75	55
School 7	81.16 |	60
School 8	80.83	60
School 9	80.83	60
School 10	79.83	50

Interpretation: The data reveals a direct **positive correlation** between healthy interaction practices and academic achievement. Schools with interaction scores above 82% consistently produced higher "Good" performance rates (70-80%). In contrast, schools where interaction scores dipped toward 79-80% saw a marked decrease in high-performing students.

4.4 Conclusion

The findings confirm that while teachers generally maintain a positive and motivating environment, the **depth of participatory interaction** is a significant differentiator in academic outcomes. "Healthy interaction" is not merely a social benefit but a measurable determinant of academic success.

CHAPTER V: SUMMARY, FINDINGS, AND CONCLUSIONS

5.1 Summary of the Study

This research investigated the impact of classroom interaction on the academic achievement of 200 elementary students across 10 schools in the Balasore district. By employing a descriptive survey design and analyzing the correlation between pedagogical engagement and Science scores, the study aimed to validate the necessity of supportive teacher-student relationships. The theoretical framework was supported by existing literature suggesting that

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effective interaction serves as a primary driver for concept clarification, socialization, and academic motivation.

5.2 Major Findings

The study successfully addressed its three core research questions:

1. **Prevalence of Practices:** The data confirmed that various healthy interaction techniques—including verbal praise, instructional prompting, and the use of mother tongue—are actively practiced within the sampled schools. However, a gap remains in non-verbal communication and student-led decision-making.
2. **Achievement Variance:** Analysis of academic scores revealed significant disparities between schools. While some institutions saw 80% of students achieve "Good" performance, others struggled with high concentrations of "Below Average" scores, suggesting that external school-specific variables are at play.
3. **Impact on Achievement:** The comparative analysis established a clear **positive correlation** between the frequency of healthy classroom interaction and student grades. Schools with higher interaction scores (above 82%) consistently yielded superior academic outcomes compared to those with lower interaction metrics.

5.3 General Conclusions

The research concludes that the classroom is not merely a site for knowledge transmission, but a dynamic social ecosystem. Teacher-student interaction is a measurable determinant of success; schools that prioritize healthy, two-way communication are more likely to see students exceed academic expectations. Consequently, fostering an interactive environment is essential for bridge-building between instructional effort and learner outcome.

5.4 Recommendations

Based on the findings, the following practices are suggested for elementary educators:

- **Shift to Indirect Teaching:** Move beyond lecturing to include more open-ended questioning and peer-correction.
- **Balance Direct/Indirect Feedback:** Use prompts and "smiling face" pedagogy to reduce student anxiety.
- **Professional Development:** Training programs should focus on "participatory depth," encouraging teachers to admit flaws and include students in classroom decision-making.

6.1 EDUCATIONAL IMPLICATIONS AND SUGGESTION FOR FURTHER STUDY

Drawing from Wiseman and Hunt’s assertion that effective teaching is defined by the ability to cultivate a motivated learning environment, this study serves to bridge the gap between instructional delivery and student motivation. By identifying specific interaction elements that mobilize students toward achievement, the findings offer significant implications for teacher-training policy and pedagogical reform. Consequently, it is suggested that educational stakeholders develop professional workshops and provide resources that support holistic student needs beyond traditional instruction. Furthermore, establishing measurable goals and appropriate instructional scaffolds will ensure a balanced environment where all students are both challenged and supported in their pursuit of success.

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