

Improving Students' Literacy and Numeracy by Implementing Local Instructional Theory (LIT)

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Article	Abstract
Keywords: Literacy; Numeracy; Local Instructional Theory (LIT); Classroom Action Research. Article History Received: Feb 11, 2026; Reviewed: Mar 11, 2026; Accepted: April 11, 2026; Published: May 08, 2026;	<i>Low levels of student literacy and numeracy skills in resource-constrained schools present a fundamental challenge in basic education. This classroom action research aims to evaluate the improvement of 5th-grade students' literacy and numeracy competencies at MI DDI Tappina through the implementation of Local Instructional Theory (LIT). The study was conducted in two iterative cycles adapting the Kemmis & Taggart model, wherein a Hypothetical Learning Trajectory (HLT) was designed utilizing the local context and surrounding environment as the primary learning medium. Data were gathered through cognitive literacy-numeracy tests, student engagement observation sheets, and in-depth interviews. Findings indicate that the average student test score increased significantly from 53% in Cycle I to 79% in Cycle II, surpassing the classical mastery target (75%). This improvement aligns with student active engagement, which rose from 80% to 92%. Qualitative data revealed a positive shift in teacher and student responses, turning highly receptive and enthusiastic as instructional materials became more concrete and relatable. The core value of this study lies in demonstrating that Local Instructional Theory serves as an effective instructional framework to overcome facility and media limitations without relying on high-tech devices.</i>



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INTRODUCTION

Literacy and numeracy skills serve as the fundamental foundation in basic education, determining students' learning success in higher grade levels. Literacy extends beyond the mere ability to read text; it encompasses the capacity to critically analyze and evaluate information. Meanwhile, numeracy refers to the ability to apply mathematical concepts and logical reasoning to solve real-world

problems. Given the critical importance of these two competencies, enhancing the quality of literacy and numeracy instruction must be a strategic focus consistently implemented at the Elementary School and Madrasah Ibtidaiyah (MI) levels.

However, this ideal condition often contrasts sharply with field reality. At Class 5 of MI DDI Tappina, a crucial problem was identified: students' literacy and numeracy skill levels remain exceptionally low. Based on in-depth interviews with teachers, this low achievement is triggered by several primary factors (1) Weak foundational abilities resulting from a lack of conceptual mastery in previous grades. (2) Limited educational facilities that fail to support independent reading and numerical exploration. (3) Severely restricted use of learning media, making abstract instructional materials difficult for students to comprehend.

Previous studies have attempted to improve literacy and numeracy through various instructional strategies, such as Problem-Based Learning (PBL) models or digital technology-based media. Nevertheless, these studies exhibit a major limitation: most interventions were designed generically, assuming the availability of adequate school facilities and technological support. Such approaches frequently fail when applied to schools or madrasahs facing facility and media constraints, such as MI DDI Tappina.

To bridge this gap, this study implements a Local Instructional Theory (LIT) framework. The expected outcome of applying LIT is the development of an adaptive, structured, local Hypothetical Learning Trajectory (HLT) rooted in students' concrete experiences and daily activities. The scientific value and novelty of this study lie in the formulation of an LIT learning trajectory specifically designed to facilitate meaningful literacy and numeracy learning amidst facility and media limitations, without relying on high-tech devices.

Therefore, identifying the problem of literacy-numeracy disparities in resource-constrained schools carries significant importance. This study aims not only to measure the improvement of 5th-grade students' literacy and numeracy skills at MI DDI Tappina through the implementation of Local Instructional Theory (LIT), but also to offer practical and methodological contributions for teachers and researchers in designing contextual, highly effective learning interventions within marginal educational environments.

METHOD

This study employs a Classroom Action Research (CAR) design aimed at intervening in and improving students' literacy and numeracy skills through the implementation of Local Instructional Theory (LIT). The research was conducted in Class 5 at MI DDI Tappina during the ongoing academic period. The subjects comprised all 5th-grade students identified as having substantial difficulties in basic literacy and numerical reasoning, supported by the classroom teacher acting as a collaborator.

The action research design was structured into two iterative cycles adapting the Kemmis & Taggart CAR model, where each cycle encompasses four primary stages: Planning, Acting, Observing, and Reflecting. The framework of Local Instructional Theory (LIT) is integrated into the planning and acting stages to guide a contextual Hypothetical Learning Trajectory (HLT) that utilizes the local surrounding environment to overcome media and facility constraints.

Action Implementation Procedures

The research procedures were carried out across two continuous cycles with the following detailed steps:

1. Cycle I (Focus: Foundational Concept Building & Concrete Activities)

Planning:

- a. Developing LIT-based lesson plans (learning modules) leveraging local context and surrounding objects in Tappina to compensate for the lack of manufactured or digital media.
- b. Designing a Hypothetical Learning Trajectory (HLT) for literacy (reading comprehension of contextual texts) and numeracy (basic arithmetic operations and contextual word problems).
- c. Constructing pre-/post-cycle test instruments, student activity observation sheets, and teacher implementation observation guides.

Acting:

- a. Literacy Phase: Students read and discuss narrative/informational texts directly relevant to their daily lives in Tappina.
- b. Numeracy Phase: Mathematics instruction begins with informal problem situations (students' real-life experiences) and progresses toward basic mathematical modeling using concrete materials available in the classroom.

Observing:

- a. The researcher and teacher-collaborator record student learning activities, group engagement, and operational obstacles encountered during implementation.
- b. Administering the Cycle I evaluation test to assess baseline literacy and numeracy progress.

Reflecting:

- a. Analyzing test results and observational data from Cycle I.
- b. Identifying persistent weaknesses (e.g., students struggling to transition from concrete to abstract concepts, or shallow reading comprehension). These reflective findings serve as the basis for revising the HLT in Cycle II.

2. Cycle II (Focus: Strengthening Conceptual Understanding & Contextual Reasoning)

Planning:

- a. Developing revised lesson plans based on Cycle I reflections.
- b. Refining the scaffolding trajectory within the LIT model to ensure a smoother transition toward abstract literacy and numeracy concepts.

Acting:

- a. Executing learning activities with an increased emphasis on complex problem-solving.
- b. Enhancing peer interactions through guided group discussions and presenting more varied literacy and numeracy materials while utilizing available local facilities.

Observing:

- a. Monitoring changes in student responses, autonomy, and performance in literacy and numeracy.
- b. Administering the Cycle II evaluation test to measure overall learning mastery.

Reflecting:

- a. Analyzing overall progress from Cycle I to Cycle II.
- b. Comparing final outcomes against the predetermined success indicators.

Data Collection and Analysis Techniques

Data were gathered through three main techniques:

1. Literacy and Numeracy Tests: Administered at the end of each cycle to quantitatively measure cognitive growth.
2. Observation Sheets: Used to record student engagement and the teacher's fidelity in implementing LIT-based instruction.
3. Interviews & Documentation: Employed to capture qualitative responses from students and teachers, as well as to document classroom actions.

Quantitative data (test scores) were analyzed using descriptive statistics by calculating the mean score ($\bar{X}$) and classical learning mastery percentage (P)

$$\bar{X} = \frac{\sum X}{N} \quad \text{and} \quad P = \frac{n}{N} \times 100\%$$

Where $\bar{X}$ represents the mean score, n is the number of students who achieved mastery, and N is the total number of students.

The performance indicator for this study is met if at least 75% of all 5th-grade students at MI DDI Tappina reach the Minimum Mastery Criterion (KKM) in both literacy and numeracy assessments.

RESULTS AND DISCUSSION

Improvement in Students' Literacy and Numeracy Skills

The evaluation test results demonstrated a significant improvement in literacy and numeracy competencies from Cycle I to Cycle II. The average cognitive achievement scores are presented in Table 1.

Table 1. Indicator Evaluation

Evaluation Indicator	Cycle I	Cycle II	Gain
Mean Literacy & Numeracy Score	53%	79%	+26%
Classical Mastery Criterion	Unfulfilled (<75%)	Fulfilled ($\geq 75\%$)	Achieved

In Cycle I, the average student score for literacy and numeracy reached only 53%. This baseline indicates that a majority of students continued to experience difficulties in processing informational texts and solving contextual mathematical problems. However, following instructional scaffolding adjustments in Cycle II, the mean score increased substantially by 26%, reaching 79%. The outcome in Cycle II successfully surpassed the predetermined classical mastery benchmark of 75%.

Student Learning Engagement

In addition to cognitive gains, the implementation of LIT positively impacted student participation and active involvement throughout the learning process.

Based on observation sheets tracking student engagement:

- Cycle I:** Student active engagement was recorded at **80%**. While relatively high, several students remained hesitant and passive during group discussions.
- Cycle II:** Student engagement rose to **92%**. Students exhibited greater confidence, actively asked questions, and enthusiastically solved literacy and numeracy problems utilizing the provided local media and environment.

Interview Findings (Teacher and Student Responses)

Qualitative data obtained through in-depth interviews with the classroom teacher and students revealed a clear shift in perception and acceptance regarding the instructional approach:

- Cycle I Responses:** During the initial cycle, responses from both the teacher and students were relatively muted. Interview findings indicate that this lower initial responsiveness stemmed from novelty; the Local

Instructional Theory (LIT) framework was unfamiliar to them. Students were unaccustomed to learning trajectories that demanded contextual analysis and independent exploration, while the teacher was still adapting to facilitating the Hypothetical Learning Trajectory (HLT).

- b. **Cycle II Responses:** By Cycle II, a highly positive shift in responsiveness occurred across both teacher and students. Students demonstrated remarkably high enthusiasm and responsiveness as they experienced the direct benefits of the LIT learning trajectory. Students reported that reading comprehension and mathematical concepts became far easier to understand and more engaging when anchored in their familiar surrounding environment in Tappina. Furthermore, the collaborating teacher confirmed that the LIT approach effectively bridged the school's media and facility limitations, yielding tangible improvements in student literacy and numeracy skills.

CONCLUSION

This study confirms that the implementation of a context-oriented Local Instructional Theory (LIT) serves as an effective solution to address low student literacy and numeracy skills in resource-constrained schools. The action research results prove that a scaffolded Hypothetical Learning Trajectory (HLT)—progressing from concrete local experiences in Tappina toward formal concepts—significantly enhances cognitive mastery and active student engagement. This approach successfully overcomes learning barriers imposed by the lack of conventional or digital media.

Applicability and Practical Implications:

The findings of this study offer broad applicability, particularly for educational institutions in marginal areas or schools facing similar facility constraints. Local Instructional Theory demonstrates that the quality of literacy and numeracy instruction does not rely solely on high-tech media, but rather on teachers' capacity to transform local environmental potential into meaningful learning tools and contexts.

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