

Effectiveness of Activity-Based Learning in Improving Literacy Outcomes in Primary Schools of Backward Districts in Odisha

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Abstract: Activity-Based Learning (ABL) is a child-centred pedagogical approach that engages learners through hands-on activities, collaborative tasks, and discovery-oriented instruction rather than rote transmission of information. This study investigated the effectiveness of ABL interventions in improving foundational literacy outcomes — specifically reading fluency and reading comprehension — among Class III students in primary schools of two educationally backward districts of Odisha: Kandhamal and Nuapada. A quasi-experimental pretest-posttest design with a control group was employed across eight schools (four intervention, four control), involving 240 Class III students. In intervention schools, trained teachers implemented a structured ABL programme comprising story cards, letter-building activities, peer reading pairs, and vocabulary games for three months. A validated Odia-language oral reading fluency assessment and a reading comprehension test were administered pre- and post-intervention. Results showed a statistically significant improvement in oral reading fluency among ABL-intervention students (mean gain of 24.3 correct words per minute) compared to control students (mean gain of 8.7 correct words per minute; $p < 0.001$). Reading comprehension scores improved by a mean of 31.6% in ABL schools versus 12.4% in control schools ($p < 0.001$). Teacher confidence in using ABL methods, measured through a post-intervention questionnaire, was moderate, with resource availability and class size identified as key implementation challenges. The study recommends scaling ABL with targeted teacher training, locally developed low-cost materials, and reduced class sizes in backward district schools.

Keywords: *Activity-Based Learning, Foundational Literacy, Primary Education, Odisha, Reading Fluency, Backward Districts*

1. Introduction

The foundational literacy crisis in India — the inability of a large proportion of primary school students to read simple text or perform basic arithmetic by the end of Grade 3 — has been extensively documented by the Annual Status of Education Report (ASER) series since 2005. ASER 2022 found that nationally only 42.8% of Class III students could read a Grade 2 level text, a finding that has barely shifted over a decade despite significant investments in school infrastructure and teacher recruitment. In states like Odisha, where a large proportion of primary school children are first-generation learners from Scheduled Tribe communities speaking Odia as a second language, foundational literacy deficits are even more pronounced.

Activity-Based Learning (ABL) is a structured pedagogical approach developed in Tamil Nadu in the late 1990s and subsequently adapted and piloted in several Indian states as an alternative to the dominant teacher-centred rote learning model. ABL reorganises classroom activity around self-paced milestone cards, peer groupings, and discovery tasks that allow children to progress at their own speed and engage with learning material through kinesthetic and social interaction rather than passive listening. Evidence from Tamil Nadu and modified versions in Gujarat and Karnataka has documented significant improvements in foundational learning outcomes associated with ABL implementation.

However, evaluations of ABL effectiveness in eastern and tribal India remain limited. The specific linguistic, pedagogical, and infrastructural contexts of Odisha's backward districts differ substantially from those in which most ABL evidence was generated: class sizes are larger, teacher-student ratios are poorer, multilingualism is more complex (many students speak Kui, Gondi, or other tribal languages at home), and learning material availability is more constrained. Context-specific evidence is essential for sound adaptation and scale-up decisions.

This study was designed to evaluate the effectiveness of a contextually adapted ABL programme in two of Odisha's most educationally disadvantaged districts over a single academic term (three months), using a quasi-experimental design to generate evidence on reading fluency and comprehension gains relative to a control group. The findings aim to inform the Odisha School Education Programme Authority's curriculum and teacher training policy under the National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN Bharat) framework.

2. Methodology

A quasi-experimental pretest-posttest design with a non-equivalent control group was employed. The study was conducted in two backward districts of Odisha designated under the Government of India's 112 Aspirational Districts programme: Kandhamal and Nuapada. Eight government primary schools were selected — four for the intervention condition (two per district) and four for the control condition (two per district) — using purposive sampling with matching on school size, student enrolment, student socioeconomic profile, and teacher-student ratio. The target population was all Class III students (age 7–9 years) enrolled in the selected schools; 240 students in total (120 intervention, 120 control) were included after excluding students with documented speech or hearing difficulties.

The ABL intervention consisted of a three-month structured programme (August to October 2023) in which teachers in intervention schools received a five-day pre-intervention training workshop conducted by the research team in collaboration with the Block Education Officer. The training covered ABL principles, activity facilitation techniques, use of story cards and letter-building materials, and classroom reorganisation into peer learning groups of four. Low-cost ABL materials (story cards, alphabet charts, vocabulary game kits) were provided to intervention schools by the research project from locally sourced materials. Control schools continued with the standard Odia-medium government curriculum without any modification.

Assessment instruments comprised a validated Odia Oral Reading Fluency (ORF) test — measuring the number of correct words read aloud per minute from a standardised Grade 2-level Odia text passage — and a 20-item multiple-choice reading comprehension test aligned to NIPUN Bharat foundational literacy benchmarks, both administered individually by trained assessors at baseline and endline. Assessors were blinded to intervention status where logistically feasible. Data were analysed in SPSS version 23 using independent samples t-tests for between-group comparisons and paired t-tests for within-group pre-post comparisons. The significance threshold was set at $p < 0.05$.

3. Results and Findings

At baseline, no statistically significant difference was found between intervention and control groups on either ORF or comprehension scores, confirming comparability of the two groups. Intervention group mean baseline ORF was 18.2 words per minute (SD=6.1) and control group mean was 17.9 words per minute (SD=5.8; $p=0.73$). At endline, intervention group mean ORF had increased to 42.5 words per minute (SD=8.3), a gain of 24.3 words per minute, compared to a control group endline mean of 26.6 words per minute (SD=7.1), a gain of only 8.7 words per minute. The between-group difference in ORF gain was statistically significant ($t=13.7$; $p<0.001$).

Reading comprehension scores showed similar patterns. Intervention group mean comprehension score increased from 28.4% at baseline to 60.0% at endline (mean gain: 31.6 percentage points), while the control group showed a mean gain of 12.4 percentage points (from 27.9% to 40.3%; $p<0.001$). Effect size for the comprehension outcome was large (Cohen's $d=1.21$), indicating substantial practical significance of the intervention beyond statistical significance. Gender-disaggregated analysis revealed no statistically significant difference in ABL intervention gains between girls and boys, a finding that contrasts with some prior studies reporting differential gender response to pedagogical changes.

Post-intervention teacher questionnaire responses ($n=8$ teachers, 4 per group) revealed that all four intervention school teachers reported increased student engagement and reduced classroom management challenges compared to the pre-intervention period. However, teachers identified three significant implementation challenges: large class sizes (mean 42 students per class in intervention schools) that made individual assessment and group facilitation difficult, insufficient supply of ABL materials for all students, and parental unfamiliarity with ABL methods leading to occasional requests for return to conventional homework formats. Teacher confidence in ABL facilitation rated as moderate (mean score 6.8 out of 10 on a Likert scale) at endline, suggesting a need for continued coaching support.

4. Discussion

The large and statistically robust improvement in both reading fluency and comprehension among ABL-intervention students over just three months is a significant finding that adds to the evidence base for ABL's effectiveness in educational disadvantaged settings within India. The magnitude of the intervention effect (ORF gain nearly three times that of control students; comprehension gain more than twice) suggests that even a relatively brief, low-cost ABL implementation can produce meaningful learning gains in contexts where baseline literacy is very low and where the alternative — conventional passive instruction — produces minimal learning increment.

The absence of a gender differential in intervention response is encouraging from an equity perspective and challenges the assumption that pedagogical innovations uniformly advantage certain gender groups. In the Kandhamal and Nuapada context, where girls' school attendance and completion rates remain below state averages, the finding that girls benefit equally from ABL suggests the approach may be a useful gender-neutral lever for improving literacy outcomes without requiring separate girl-focused interventions at the classroom level.

The implementation challenges identified — large class sizes, material shortages, and limited parental familiarity — are structural rather than inherent to the ABL approach and have been similarly documented in ABL rollouts in other Indian states. The Tamil Nadu experience suggests that these challenges are manageable with systematic state-level procurement of materials, sustained teacher coaching (not just initial training), and deliberate community engagement to build parental understanding and support. The NIPUN Bharat mission's foundational literacy focus provides a policy umbrella within which an Odisha-specific ABL scale-up could be effectively anchored.

5. Conclusion

This quasi-experimental study provides statistically robust evidence that a contextually adapted ABL programme can significantly accelerate foundational literacy acquisition — reading fluency and comprehension — among Class III students in educationally backward districts of Odisha over a three-month implementation period. The benefits were consistent across gender groups and across both study districts.

The study recommends: (i) systematic integration of ABL principles into the Odisha state government's primary teacher in-service training programme under NIPUN Bharat; (ii) state-level procurement and distribution of standardised Odia-language ABL story card and activity material sets for all primary schools in backward districts; (iii) reduction of class sizes to a maximum of 30 students in ABL implementation schools to enable effective group facilitation; (iv) establishment of block-level ABL resource teachers to provide ongoing classroom coaching support; and (v) community awareness sessions for parents on ABL principles and home reading engagement strategies. Sustained investment in these elements is necessary for the short-term gains documented here to translate into sustained improvements in foundational literacy.

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