

Assessment of Foundational Literacy and Numeracy Competency among Tribal Primary School Learners of Sadar Block of Keonjhar District

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Abstract- Foundational Literacy and Numeracy (FLN) form the basis of children's lifelong learning and academic achievement. Ensuring that every child acquires basic reading, writing, and numeracy skills during the early years of schooling has become a national priority under the National Education Policy (NEP) 2020 and the NIPUN Bharat Mission, Government of India, 2020. However, tribal learners continue to face multiple educational challenges due to socio-economic disadvantage, language barriers, inadequate learning resources, and limited parental support, creating a significant research gap at the district level, particularly in Keonjhar District, Odisha. The present study aimed to assess the foundational literacy competencies, assess the foundational numeracy competencies, and compare these competencies among tribal learners studying in government and private schools. A quantitative descriptive survey design was adopted. The study included 150 tribal learners selected through stratified random sampling from 10 primary schools (five government and five private) in Sadar block of Keonjhar District. Data were collected using a researcher-developed Foundational Literacy and Numeracy Assessment Tool. Percentage analysis was used to assess literacy and numeracy competency levels, while an independent-samples t-test was employed to compare government and private school learners. The findings revealed that tribal learners demonstrated a satisfactory level of foundational literacy ($M = 11.75$) and numeracy ($M = 12.08$) competencies. Private school learners performed better than government school learners in both literacy and numeracy competencies. The study concludes that strengthening competency-based pedagogy, multilingual teaching practices, teacher professional development, and effective implementation of the National Education Policy (2020) and the NIPUN Bharat Mission can significantly enhance foundational learning among tribal learners. The findings provide useful evidence for educators, policymakers, and school administrators to improve the quality of foundational education in tribal areas.

Keywords: Foundational Literacy, Foundational Numeracy, Tribal Learners, Government Schools, Private Schools, Keonjhar District

I. INTRODUCTION

Foundational literacy refers to the ability to read with comprehension, express ideas through writing, and communicate meaningfully, whereas foundational numeracy encompasses basic number sense, arithmetic operations, and problem-solving skills. Recognizing the critical importance of these competencies, the Government of India has emphasized the universal attainment of FLN by Grade III through the National Education Policy (NEP) 2020 and the NIPUN Bharat Mission (Government of India, 2020; Ministry of Education, 2021). Although school enrolment has increased significantly in India, learning outcomes continue to remain a major concern, particularly among children belonging to underprivileged and tribal communities. Tribal learners often encounter multiple educational challenges, including poverty, being first-generation learners, inadequate educational resources, and linguistic differences between their home language and the language of classroom instruction. These factors considerably influence the acquisition of foundational literacy and numeracy skills during the early years of schooling (NCERT, 2019). Odisha is one of the Indian states with a substantial tribal population, and Keonjhar District is socially and educationally significant because approximately 44% of its population belongs to the Scheduled Tribes (Census of India, 2011). Despite various government initiatives to improve educational access and quality, several studies have indicated that learning outcomes, particularly at the foundational stage, remain below

the expected standards in the district. Many tribal children continue to experience difficulties in reading fluency, reading comprehension, and understanding basic mathematical concepts during the primary grades, which subsequently affects their academic achievement and increases the likelihood of school dropout. Language also plays a crucial role in foundational learning. While classroom instruction in Keonjhar is primarily delivered in Odia or English, many tribal children speak their indigenous languages at home. Research on Multilingual Education (MLE) in tribal schools has demonstrated that early instruction in the mother tongue significantly enhances classroom participation and learning achievement (Mohanty & Mishra, 2017). This highlights the need for culturally and linguistically responsive approaches in assessing the foundational literacy and numeracy competencies of tribal learners. Furthermore, studies conducted in Odisha have reported that many primary school children fail to attain grade-appropriate literacy and numeracy competencies, emphasizing the need for early intervention and systematic assessment of FLN (Das & Behera, 2022). Despite these findings, there remains a significant research gap regarding district-specific evidence on the foundational literacy and numeracy competencies of tribal learners in Keonjhar District. Moreover, learners' limited reading proficiency has been identified as a major factor affecting not only literacy development but also numeracy achievement and overall academic performance (Idulog et al., 2023). Therefore, the present study seeks to assess the foundational literacy and numeracy competencies among tribal learners in Keonjhar District, Odisha, thereby providing empirical evidence that may support educators, school administrators, and policymakers in designing targeted interventions to strengthen foundational learning and improve educational outcomes.

II. LITERATURE REVIEW

Several studies have been conducted on foundational literacy and numeracy (FLN) skills among primary school children. Partha Sarathi Mallik (2025) studied gender differences and parental involvement in FLN development among 120 primary students and found that girls performed better than boys in literacy and

numeracy, while parental involvement positively influenced FLN outcomes. Similarly, Pragnya Paramita (2025) examined the impact of FLN on foundational competencies in Odisha through a mixed-method study involving students, teachers, and administrators, and reported a strong positive relationship between FLN skills and academic competencies. Biswajit Sarkar (2025) analysed the implementation of the NIPUN Bharat Mission and found that flexible and localized approaches improved FLN outcomes, whereas language barriers and inadequate infrastructure hindered progress in some states. In another study, Punit Kumar Kanujiya (2025) highlighted the importance of early childhood care and education (ECCE) under National Education Policy 2020 for promoting children's cognitive, social, and emotional development. Further, Madhusmita Sathua (2024) investigated FLN skills among Grade 3 students in Nayagarh district and found no significant difference in literacy and numeracy achievement among students. Atin Fatimah (2024) developed and validated assessment tools for measuring literacy and numeracy skills in early childhood education and concluded that the tools were reliable and valid. M. Zainudin (2023) reviewed research trends in literacy and numeracy studies and reported that most studies focused on FLN implementation and case-study approaches. Likewise, Areej Isam Barham (2019) assessed literacy and numeracy levels among first-grade students in Qatar and observed that parental educational level significantly influenced children's FLN achievement. Earlier, Behera (2015) evaluated tribal primary education in Mayurbhanj district and identified low literacy rates, high dropout rates, and language barriers as major challenges affecting tribal learners.

ECCE in India is fragmented, with Anganwadi's under the Ministry of Women and Child Development often lacking trained educators and appropriate pedagogy. Integrating these centres with FLN goals requires cross ministerial coordination, which has proven challenging in practice (Singh, 2020). According to the Ministry of Education (2020), achieving FLN in the early years is a national priority under the National Education Policy (NEP) 2020, as children who fail to develop these

foundational skills often experience learning difficulties throughout their educational journey. The World Bank (2019) reported that countries investing in foundational learning during the early years demonstrate higher educational achievement, improved retention rates, and stronger economic development. Several studies have identified major barriers to achieving FLN in India. Educational inequality, inadequate school infrastructure, teacher shortages, insufficient professional training, and socioeconomic disadvantages continue to hinder children's learning outcomes, particularly in rural and marginalized communities (Pratham, 2022; Srivastava & Singh, 2021). The initiative provides clear learning outcomes, competency-based assessments, teacher training, and continuous monitoring to ensure that every child achieves foundational literacy and numeracy by Grade 3 (Government of India, 2021). The policy also emphasizes community participation, parental engagement, and data-driven educational planning to improve learning outcomes. Parental involvement has consistently been identified as one of the strongest predictors of children's literacy and numeracy development. Senechal and LeFevre (2002) demonstrated that parents who regularly engage in shared reading activities with their children significantly improve their children's reading ability over time. Similarly, Skwarchuk et al. (2014) found that both formal learning activities (such as helping with homework) and informal home experiences contribute positively to children's early literacy and numeracy skills. Turkheimer et al. (2003) suggested that genetic influences on children's cognitive development are moderated by socioeconomic conditions, indicating that supportive family environments can strengthen children's learning outcomes. The initiative provides clear learning outcomes, competency-based assessments, teacher training, and continuous monitoring to ensure that every child achieves foundational literacy and numeracy by Grade 3 (Government of India, 2021). The policy also emphasizes community participation, parental engagement, and data-driven educational planning to improve learning outcomes.

2.1 Objectives of the Study

1. To assess the level of foundational literacy competencies among tribal learners.
2. To assess the level of foundational numeracy competencies among tribal learners.
3. To compare the foundational literacy and numeracy competencies among tribal learners studying in government and private schools.

2.2 Hypothesis of the Study

H₀: There is no significant difference in the foundational literacy and numeracy competencies among tribal learners studying in government and private schools in Keonjhar District, Odisha.

III. METHODOLOGY

The present study adopted a quantitative research approach using a descriptive survey research design to assess the foundational literacy and numeracy competencies among tribal learners of Sadar block in Keonjhar District of Odisha. The study was conducted in 10 selected primary schools, comprising five Government Schools (GS) and five Private Schools (PS). The population consisted of tribal learners enrolled in these schools. A total of 150 tribal learners participated in the study, including 75 learners from Government Schools (GS) and 75 learners from Private Schools (PS). The participants were selected through a stratified random sampling technique, in which the schools were first categorized into government and private categories, followed by the random selection of learners from each group to ensure equal representation and reduce sampling bias. Data were collected using a researcher-developed Foundational Literacy and Numeracy Assessment Tool, developed in accordance with the learning outcomes prescribed in the National Education Policy (2020) and the NIPUN Bharat Mission. The instrument assessed learners' competencies in foundational literacy and numeracy. Prior to data collection, permission was obtained from the respective school authorities, and informed consent, confidentiality, and voluntary participation were ensured throughout the study. The collected data were coded, organized, and analysed using appropriate statistical techniques. Mean was used to determine the average foundational literacy and

numeracy competency scores, while an independent-samples t-test was employed to compare the competencies of learners studying in Government Schools (GS) and Private Schools (PS).

IV. RESULTS

This chapter describes the analysis and interpretation of the data collected to assess tribal learners' foundational literacy and numeracy competencies among tribal learners in Keonjhar District, Odisha. The analysis adhered to the study's objective. According to the study's goals, the gathered data were examined using the proper descriptive statistical methods. The average level of foundational reading and numeracy competencies among male and female students in the chosen schools was ascertained using mean scores. Additionally, the overall levels of core reading and numeracy competencies among students attending government and private schools were evaluated and compared using t-test. These statistical methods allowed for meaningful comparisons across various school groups and offered a clear and methodical comprehension of the students' performance.

The results are displayed in a number of tables, and their interpretations come next. While t-test was used to categorise the levels of reading and numeracy competence and to compare the performance of government and private schools, the mean was employed to summarise the average competency scores of learners.

4.1 Demographic Information

The present study was conducted among tribal learners enrolled in 10 selected primary schools in Keonjhar District, Odisha. Using a stratified random sample technique, individuals were chosen from both public and private schools. 75 students from government schools (GS) and 75 students from private schools (PS) made up the sample. With 75 male and 75 female students, the sample also guaranteed equal gender representation. There were 39 male and 36 female students in the government school and there were 36 male and 39 female students in the private school. A meaningful comparison of foundational reading and numeracy

competencies between students in government and private schools was made possible by the participants' equal distribution across gender and school type, which improved the sample's representativeness.

4.2 Foundational Literacy Score

Table-1 Both Government and Private School Learners Foundational Literacy Score

Sl. No	School Name	Number of Students	Mean Literacy Score
1	GS-1	15	10.86
2	GS-2	15	11.34
3	GS-3	15	10.47
4	GS-4	15	12.40
5	GS-5	15	12.00
6	PS-1	15	12.20
7	PS-2	15	12.74
8	PS-3	15	12.26
9	PS-4	15	10.80
10	PS-5	15	12.40
Total	10 Schools	150	11.75

Table 1 presents the foundational literacy scores of 150 tribal learners from 10 selected schools in Keonjhar District, comprising five government schools (GS-1 to GS-5) and five private schools (PS-1 to PS-5), with 15 students from each school. The overall mean literacy score obtained by the learners was 11.75, it's indicating a good level of foundational literacy competency among the sampled learners. Among the government schools, GS-4 recorded the highest mean literacy score ($M = 12.40$), followed by GS-5 ($M = 12.00$), whereas GS-3 obtained the lowest mean literacy score ($M = 10.47$). Among the private schools, PS-2 achieved the highest mean literacy score ($M = 12.74$), followed by PS-3 ($M = 12.26$) and PS-5 ($M = 12.40$). In contrast, PS-4 recorded the lowest mean literacy score ($M = 10.80$) among the private schools.

4.3 Foundational Literacy Score of Male Stdents

Table-2 Male Students Foundational Literacy Score

Sl. No	School Name	Male Students	Mean Literacy Score
1	GS-1	8	10.75
2	GS-2	6	11.17
3	GS-3	10	10.40
4	GS-4	08	12.25
5	GS-5	07	11.86
6	PS-1	08	12.13
7	PS-2	08	12.63
8	PS-3	07	12.14
9	PS-4	05	10.60
10	PS-5	08	12.38
Total	10 Schools	75	11.64

Table 2 presents the foundational literacy scores of 75 male tribal learners from 10 selected government (GS-1 to GS-5) and private schools (PS-1 to PS-5) in Keonjhar District. The total mean literacy score obtained by the male learners was 11.64, it's indicating a good level of foundational literacy competency among the sampled male learners. Among the government schools, GS-4 recorded the highest mean literacy score (M = 12.25), followed by GS-5 (M = 11.86), whereas GS-3 obtained the lowest mean literacy score (M = 10.40). Among the private schools, PS-2 achieved the highest mean literacy score (M = 12.63), followed by PS-5 (M = 12.38) and PS-3 (M = 12.14). In contrast, PS-4 recorded the lowest mean literacy score (M = 10.60) among the private schools.

4.4 Foundational Literacy Score of Female students

Table-3 Female Students Foundational Literacy Score

Sl. No	School Name	Female Students	Mean Literacy Score
1	GS-1	07	11.00
2	GS-2	09	11.44
3	GS-3	05	10.60
4	GS-4	07	12.57
5	GS-5	08	12.13
6	PS-1	07	12.29
7	PS-2	07	12.86

8	PS-3	08	12.38
9	PS-4	10	10.90
10	PS-5	07	12.43
Total	10 Schools	75	11.86

Table 3 presents the foundational literacy scores of 75 female tribal learners from 10 selected government (GS-1 to GS-5) and private schools (PS-1 to PS-5) in Keonjhar District. The female learners obtained an overall mean literacy score of 11.86, its's indicating a good level of foundational literacy competency among the sampled female learners. Among the government schools, GS-4 recorded the highest mean literacy score (M = 12.57), followed by GS-5 (M = 12.13), whereas GS-3 obtained the lowest mean literacy score (M = 10.60). Among the private schools, PS-2 achieved the highest mean literacy score (M = 12.86), followed by PS-5 (M = 12.43), PS-3 (M = 12.38), and PS-1 (M = 12.29). In contrast, PS-4 recorded the lowest mean literacy score (M = 10.90) among the private schools.

4.5 Numeracy Competency Score

Table-4 Both Government and Private School Learners Numeracy Competency Score

Sl. No	School Name	Male Students	Mean Numeracy Score
1	GS-1	15	11.20
2	GS-2	15	11.74
3	GS-3	15	10.94
4	GS-4	15	12.60
5	GS-5	15	12.33
6	PS-1	15	12.40
7	PS-2	15	13.07
8	PS-3	15	12.60
9	PS-4	15	11.26
10	PS-5	15	12.67
Total	10 Schools	150	12.08

Table 4 presents the foundational numeracy scores of 150 tribal learners from 10 selected government (GS-1 to GS-5) and private schools (PS-1 to PS-5) in Keonjhar District. Each school contributed 15 learners, resulting in a total mean numeracy score of 12.08. This overall mean indicates that the learners

demonstrated a good level of foundational numeracy competency. Among the government schools, GS-4 recorded the highest mean numeracy score ($M = 12.60$), followed by GS-5 ($M = 12.33$), whereas GS-3 obtained the lowest mean numeracy score ($M = 10.94$). Among the private schools, PS-2 achieved the highest mean numeracy score ($M = 13.07$), followed by PS-5 ($M = 12.67$) and PS-3 ($M = 12.60$). In contrast, PS-4 recorded the lowest mean numeracy score ($M = 11.26$) among the private schools.

4.6 Numeracy Competencies Score of Male students

Table-5 Male Students Numeracy Competencies Score

Sl. No	School Name	Male Students	Mean Numeracy Score
1	GS-1	8	11.13
2	GS-2	6	11.67
3	GS-3	10	10.90
4	GS-4	08	12.50
5	GS-5	07	12.29
6	PS-1	08	12.38
7	PS-2	08	13.00
8	PS-3	07	12.57
9	PS-4	05	11.20
10	PS-5	08	12.63
Total	10 Schools	75	12.03

Table 5 presents the foundational numeracy scores of 75 male tribal learners from 10 selected government (GS-1 to GS-5) and private schools (PS-1 to PS-5) in Keonjhar District. The total mean numeracy score obtained by the male learners was 12.03, it's indicating a high level of foundational numeracy competency among the sampled male learners. Among the government schools, GS-4 recorded the highest mean numeracy score ($M = 12.50$), followed by GS-5 ($M = 12.29$), while GS-3 obtained the lowest mean numeracy score ($M = 10.90$). Among the private schools, PS-2 achieved the highest mean numeracy score ($M = 13.00$), followed by PS-5 ($M = 12.63$), PS-3 ($M = 12.57$), and PS-1 ($M = 12.38$). In contrast, PS-4 recorded the lowest mean numeracy score ($M = 11.20$) among the private schools.

4.6 Numeracy Competencies Score of Female Students

Table-6 Female Students Numeracy Competencies Score

Sl. No	School Name	Female Students	Mean Numeracy Score
1	GS-1	07	11.29
2	GS-2	09	11.78
3	GS-3	05	11.00
4	GS-4	07	12.71
5	GS-5	08	12.38
6	PS-1	07	12.43
7	PS-2	07	13.14
8	PS-3	08	12.63
9	PS-4	10	11.30
10	PS-5	07	12.71
Total	10 Schools	75	12.14

Table 6 presents the numeracy competency scores of 75 female students from 10 schools (five government schools and five private schools). The total mean numeracy score obtained by the female students was 12.14, it's indicating that the participants demonstrated a good level of foundational numeracy competency. Among the government schools, the mean numeracy scores ranged from 11.00 to 12.71. GS-4 recorded the highest mean score ($M = 12.71$), followed by GS-5 ($M = 12.38$), while GS-3 obtained the lowest mean score ($M = 11.00$). Among the private schools, the mean numeracy scores ranged from 11.30 to 13.14. PS-2 achieved the highest mean numeracy score ($M = 13.14$), followed by PS-3 ($M = 12.63$) and PS-5 ($M = 12.71$). PS-4 recorded the lowest mean score ($M = 11.30$).

4.7 Comparison of Foundational Literacy Competencies between Government and Private School Learners

Table-7 Foundational Literacy Competencies between Government and Private School Learners

Group	N	Mean	SD	t	df	p
Government School Learners	75	11.41	1.15			
Private School Learners	75	12.09	0.98	3.89	148	0.001

An independent-samples t-test was conducted to compare the foundational literacy competencies of tribal learners studying in government and private schools. The findings revealed that private school learners ($M = 12.09$, $SD = 0.98$) scored significantly higher than government school learners ($M = 11.41$, $SD = 1.15$), $t(148) = 3.89$, $p < .001$. Therefore, the

null hypothesis was rejected, indicating a statistically significant difference in foundational literacy competency between government and private school learners.

4.8 Comparison of Foundational Numeracy Competencies between Government and Private School Learners

Table-8 Foundational Numeracy Competencies between Government and Private School Learners

Group	N	Mean	SD	t	df	p
Government School Learners	75	11.76	1.08			
Private School Learners	75	12.40	0.94	3.76	148	0.001

An independent-samples t-test was conducted to compare the foundational numeracy competencies of tribal learners studying in government and private schools. The results showed that private school learners ($M = 12.40$, $SD = 0.94$) achieved significantly higher numeracy scores than government school learners ($M = 11.76$, $SD = 1.08$), $t(148) = 3.76$, $p < .001$. Hence, the null hypothesis was rejected, indicating a statistically significant difference in foundational numeracy competency between government and private school learners.

attention is required to strengthen reading comprehension, language development, and communication skills during the foundational stage.

The study also found that private school learners outperformed government school learners in both literacy and numeracy competencies, reflecting differences in classroom practices, teacher support, learning resources, and school environments. These findings are consistent with Partha Sarathi Mallik and Pradeep Suna (2025), who emphasized that supportive home environments and active parental involvement significantly improve foundational literacy and numeracy outcomes among primary school learners. Similarly, Sthapak and Sawlani (2024) reported that effective teacher support, inclusive pedagogy, and community participation contribute positively to children's foundational learning. Furthermore, Barham et al. (2019) found that literacy and numeracy competencies are closely related, indicating that improvement in one domain positively influences achievement in the other. In

V. DISCUSSION

The findings of the present study indicate that tribal learners in Keonjhar District have attained satisfactory levels of foundational literacy and numeracy competencies, although noticeable differences were observed between government and private schools. The results revealed that learners demonstrated slightly higher achievement in numeracy than in literacy, suggesting that greater

addition, Cummins (2000) highlighted the importance of multilingual education in promoting literacy development and improving overall learning outcomes among children from diverse linguistic backgrounds. Therefore, strengthening teacher professional development, competency-based classroom practices, multilingual instruction, quality teaching-learning materials, parental participation, and effective implementation of the National Education Policy (2020) and the NIPUN Bharat Mission can substantially improve foundational literacy and numeracy competencies among tribal learners in Keonjhar District.

VI. EDUCATIONAL IMPLICATION

- **Strengthening Foundational Literacy and Numeracy (FLN):** The study highlights the need to strengthen foundational literacy and numeracy instruction in tribal schools through competency-based teaching, regular classroom assessment, and early intervention programmes to ensure that every learner acquires essential learning skills.
- **Enhancing Teacher Professional Competence:** Teachers should be provided with continuous professional development programmes on learner-centred pedagogy, activity-based learning, multilingual classroom practices, and competency-based assessment to improve the quality of instruction and students' learning outcomes.
- **Providing Remedial and Individualized Learning Support:** Students who demonstrate lower levels of literacy and numeracy competencies should receive remedial teaching, personalized academic support, and continuous progress monitoring to reduce learning gaps and improve overall academic achievement.
- **Developing Culturally Relevant Teaching–Learning Materials:** Schools should use teaching-learning resources that incorporate the local language, culture, and real-life experiences of tribal communities. Contextualized learning materials can enhance students' participation, motivation, and understanding of foundational concepts.
- **Promoting an Integrated Approach to Literacy and Numeracy:** Since literacy and numeracy

competencies are closely related, teachers should design integrated classroom activities that simultaneously develop reading, writing, communication, logical reasoning, and mathematical problem-solving skills.

- **Supporting Evidence-Based Educational Planning:** The findings of the study can assist educational administrators and policymakers in planning targeted interventions, strengthening the implementation of the National Education Policy (2020) and the NIPUN Bharat Mission, allocating resources effectively, and improving the quality of foundational education in tribal schools.

VII. SUGGESTION FOR FURTHER STUDY

- Future studies should examine the long-term development of FLN skills and policy impacts on tribal learners.
- Research should expand to other subjects, regions, and comparisons between tribal and non-tribal students.
- More qualitative research is needed on effective teaching methods, teacher readiness, and multilingual education practices.
- Future studies should explore the impact of parental involvement, socio-economic status, and home learning environments on FLN.
- Research should focus on inclusive education and support for tribal students with diverse learning needs.
- Compare FLN competencies across different types of schools, such as government and private schools, to identify effective educational practices.

VIII. CONCLUSION

The present study concludes that tribal learners in Keonjhar District have achieved a satisfactory level of foundational literacy and numeracy competencies, although differences exist between government and private schools. Overall, learners demonstrated better performance in numeracy than literacy, indicating the need to strengthen language development, reading comprehension, and communication skills during the foundational stage of education. The findings further revealed that private school learners performed better

than government school learners in both literacy and numeracy competencies, highlighting the importance of quality teaching, effective classroom practices, adequate learning resources, and supportive educational environments. These findings support the need for continuous improvement in government schools through competency-based instruction, multilingual teaching approaches, teacher professional development, and regular formative assessment. The study also emphasizes the importance of parental involvement and community participation in improving children's foundational learning. Effective implementation of the National Education Policy (2020) and the NIPUN Bharat Mission can further strengthen foundational education among tribal learners. Overall, the study provides valuable evidence for educators, school administrators, and policymakers to design appropriate educational interventions that enhance foundational literacy and numeracy competencies and ensure equitable, quality education for tribal children in Keonjhar District.

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