

Teacher Competencies and Foundational Literacy and Numeracy Achievement in Primary Education: A Conceptual Framework and Review of Indian Evidence

Mr. Toshabanta Duan¹, Dr. Saroj Nayyar²

¹Research Scholar, Faculty of Education, Kalinga University, Naya Raipur, Chhattisgarh, India

²Assistant Professor, Faculty of Education, Kalinga University, Naya Raipur, Chhattisgarh, India

DOI: <https://doi.org/10.51583/IJLTEMAS.2026.150900010>

Received: 15 September 2026; Accepted: 17 September 2026; Published: 30 September 2026

ABSTRACT

Foundational Literacy and Numeracy (FLN) has become a central priority of primary education in India under the National Education Policy (NEP) 2020 and the NIPUN Bharat Mission. Policy implementation, however, depends on how teachers interpret curriculum expectations, select pedagogical strategies, assess learning, respond to learner diversity, and adapt their practice. This paper is presented as a conceptual paper supported by a critical review of policy documents, large-scale learning assessments, and selected empirical studies relevant to teacher competencies and FLN in India. It synthesises evidence from the Foundational Learning Study (FLS), Annual Status of Education Report (ASER), PARAKH Rashtriya Sarvekshan, teacher-focused FLN studies, and literature on teacher knowledge and professional learning.

The review indicates that teacher competence is multidimensional, encompassing content knowledge, pedagogical knowledge, assessment literacy, inclusive practice, communication, digital competence, and reflective professional practice. The paper proposes a revised Teacher Competency–FLN Achievement Framework (TCFAF) in which teacher competencies are linked to FLN through classroom processes and learner engagement, while professional development and structural conditions operate as enabling or moderating factors. The framework is not presented as evidence of a causal relationship; rather, it offers propositions that can be tested empirically. The paper concludes with implications for teacher education, continuous professional development, school leadership, and future research.

Keywords: Teacher competencies; Foundational Literacy and Numeracy; FLN; NIPUN Bharat; teacher professional development; primary education; conceptual framework; India

INTRODUCTION

Foundational Literacy and Numeracy (FLN) refers to the foundational capabilities that enable children to read with understanding, communicate through language, develop early writing abilities, understand number and quantity, perform basic operations, and apply mathematical thinking in familiar situations. In India, FLN has acquired explicit policy priority through NEP 2020 and NIPUN Bharat. NIPUN Bharat was launched in 2021 as a national mission for foundational learning, while the Foundational Learning Study (FLS) 2022 established national evidence and benchmarks for Grade 3 foundational literacy and numeracy. The FLS covered approximately 86,000 Grade 3 learners across about 10,000 schools and assessed foundational literacy and numeracy in 20 languages. These system-level assessments make clear that foundational learning is a measurable national priority, but they do not by themselves establish that particular teacher competencies cause particular learner outcomes.

Recent evidence also shows why teacher practice remains an important analytical focus. ASER 2024 continued to assess basic reading and arithmetic among children aged 5–16 in rural India and emphasised the wide variation in learning levels within the same grade. PARAKH Rashtriya Sarvekshan 2024 assessed

Grade 3 foundational-stage competencies nationally and included teacher and school questionnaires, creating a stronger basis for considering classroom and school conditions alongside learner outcomes. Thus, the current evidence base increasingly supports a systems perspective in which teacher competencies are considered alongside curriculum, assessment, resources, leadership, time, language, and learner diversity.

The present paper responds to this context by revising an earlier conceptual treatment of teacher competencies and FLN. The revised paper first clarifies its status as a conceptual paper informed by a critical literature and policy review. It then identifies a set of teacher competencies relevant to FLN, synthesises Indian and comparable evidence, explains the theoretical foundations of the framework, and proposes a model for empirical testing. Importantly, the framework does not assume a simple linear or deterministic relationship between teacher competence and student achievement.

Nature and Scope of the Paper

This is a conceptual paper rather than an empirical study. No original sample, questionnaire, classroom observation, intervention, or statistical analysis is reported in this manuscript. The purpose is to synthesise established theoretical perspectives and available Indian evidence and to develop a conceptually testable framework connecting teacher competencies, classroom processes, learner engagement, and FLN achievement. The empirical findings cited in the review are therefore treated as supporting or qualifying evidence rather than as findings generated by the present study.

Conceptual Objectives

To identify and organise the major dimensions of teacher competence relevant to foundational literacy and numeracy.

To critically synthesise evidence on teacher preparedness, classroom practices, professional development, and FLN-related learning outcomes in India and comparable contexts.

To explain how established learning and teacher-knowledge theories inform the proposed Teacher Competency–FLN Achievement Framework.

To identify structural and contextual conditions that may enable or constrain the translation of teacher competence into classroom practice.

To formulate propositions that can be examined through future empirical research.

Guiding Research Questions

What dimensions of teacher competency are most relevant to effective FLN implementation in primary education?

What does existing Indian and comparable evidence suggest about the relationship between teacher competencies, classroom practices, and foundational learning?

How do professional development, mentoring, school leadership, and structural conditions shape the enactment of FLN-oriented teacher competencies?

How can these relationships be represented in a conceptual framework suitable for future empirical testing?

Concept and Dimensions of Teacher Competency for FLN

Teacher competency is understood here as an integrated professional capacity involving knowledge, skills, attitudes, values, judgement, and professional behaviours. Shulman's work on teacher knowledge is particularly relevant because effective teaching requires more than subject knowledge: teachers must also understand how particular content can be represented and taught to particular learners. For FLN, this means

that knowledge of early language and mathematics must be connected to developmentally appropriate pedagogy, assessment, interaction, and adaptation.

Content Competency

Content competency includes knowledge of early language development, oral language, phonological awareness, reading, writing, number sense, operations, patterns, measurement, and age-appropriate mathematical reasoning. It also involves recognising common misconceptions and connecting concepts with children's everyday experiences.

Pedagogical Competency

Pedagogical competency concerns the selection and enactment of developmentally appropriate teaching approaches such as play-based learning, storytelling, shared and guided reading, hands-on mathematics, experiential learning, inquiry, collaborative learning, and differentiated instruction. The issue is not merely whether a teacher knows these approaches, but whether the teacher can select and adapt them to learner needs.

Assessment Competency

Assessment competency includes diagnostic assessment, formative assessment, observation, interpretation of evidence, feedback, learner portfolios, and remedial planning. NIPUN Bharat explicitly links competency-based learning with learning outcomes and teacher capacity to provide varied learning opportunities and monitor progress.

Inclusive and Multilingual Competency

Foundational classrooms frequently include linguistic, cultural, social, and learning diversity. Teachers therefore require competence in inclusive pedagogy, multilingual interaction, gender-responsive practice, and support for children with diverse learning needs.

Communication Competency

Teacher–child talk, questioning, listening, storytelling, feedback, and interaction are central to early language development. Communication competency therefore cuts across literacy instruction and the broader classroom environment.

Digital Competency

Digital competency involves the purposeful use of digital resources, educational applications, digital content, and technology-supported assessment. Digital tools should be treated as complementary resources rather than substitutes for developmentally appropriate human interaction.

Reflective Professional Competency

Reflective competency includes self-evaluation, peer observation, professional collaboration, classroom inquiry, and continuous professional development. Reflection is particularly important when teachers need to adapt standard FLN materials to local languages, multigrade contexts, and individual learning needs.

Review of Literature and Evidence

The literature is organised around four strands: (a) system-level evidence on foundational learning, (b) teacher preparedness and classroom implementation, (c) professional development and teacher capacity, and (d) theoretical and structural explanations of how teacher competence may translate into learning. This organisation addresses a limitation of the earlier paper, which discussed teacher competencies primarily through conceptual assertions without a sufficiently developed empirical evidence base.

System-Level Evidence on FLN in India

The Foundational Learning Study 2022 provides a national baseline for understanding Grade 3 foundational literacy and numeracy. It was designed to assess what children could do, establish benchmarks, and inform the NIPUN Bharat mission. Its national scale and multilingual coverage make it an important reference point for research on foundational learning, although it should not be interpreted as a direct assessment of teacher competency.

ASER provides a complementary perspective because it is a rural household-based assessment and focuses on basic reading and arithmetic. ASER 2024 reached more than 650,000 children across more than 600 districts in 26 states and two Union Territories. Its results illustrate substantial variation in children's basic skills even within the same grade, reinforcing the need for teaching that responds to children's actual learning levels rather than relying solely on grade-level progression.

PARAKH Rashtriya Sarvekshan 2024 adds a school-based competency perspective. The national survey covered Grades 3, 6 and 9 and collected information through student, teacher, and school questionnaires. For Grade 3, language and mathematics were assessed through competency-based items. The national report provides evidence of uneven performance across individual foundational competencies, indicating that broad labels such as 'literacy' and 'numeracy' conceal multiple skills that teachers must address through targeted instruction.

Evidence on Teacher Preparedness and FLN Practice

Recent teacher-focused studies provide more direct evidence about implementation. A 2025 study of teachers' perceptions of SCERT Odisha FLN workbooks used a descriptive survey of 60 teachers and reported generally positive perceptions, while most differences by gender and teaching experience were not statistically significant. Such evidence is useful for understanding teacher perceptions of instructional resources, but perception should not be treated as equivalent to observed classroom competence or learner achievement.

A 2026 study from Puri district, Odisha, examined teachers' perceptions, classroom practices, and challenges related to FLN implementation. Its focus is particularly relevant because it moves beyond policy description toward teacher-level implementation. However, findings from a district-level study should be interpreted within their local context and should not automatically be generalised to all Indian primary schools.

Research on foundational numeracy also highlights the importance of teachers' understanding of numeracy as more than procedural calculation. Gandhi (2021) argues for contextualised mathematical language and experiences in the foundational years, suggesting that teacher preparation should address mathematical discourse and dispositions as well as procedural knowledge.

Teacher Professional Development and Capacity Building

NIPUN Bharat's implementation architecture explicitly includes mentor preparation, FLN NISHTHA training, contextualisation of a teacher competency framework, and training in FLN content, pedagogy, assessment, and teaching-learning materials. This policy design supports the argument that teacher competency should be understood as a developmental construct rather than a fixed individual attribute.

Recent evidence on teacher learning also points toward the importance of sustained support. The Teaching Learning Practices Survey 2025 observed 1,050 classrooms across 21 districts in nine states and examined classroom environments, lesson planning, language and mathematics teaching, instructional time, and teachers' professional development experiences. Such observational evidence is valuable because it distinguishes reported training participation from actual classroom enactment.

Evidence from state-level capacity-building initiatives further suggests that professional development is more meaningful when it is connected to classroom practice, mentoring, and follow-up. At the same time,

implementation research indicates that frontline actors interpret and negotiate reforms within organisational and local constraints. Therefore, professional development should not be assumed to translate automatically into changed practice.

Critical Synthesis and Research Gap

The reviewed evidence reveals three important patterns. First, India now has substantial system-level evidence about foundational learning, but large-scale learning assessments are not designed primarily to establish causal links between teacher competencies and student achievement. Second, teacher-focused studies indicate variation in perceptions, preparedness, classroom practices, and professional learning, but many are localised, descriptive, or based on self-report. Third, policy frameworks increasingly emphasise competency, mentoring, assessment, and professional development, while implementation research highlights the influence of organisational and structural conditions.

The resulting research gap is therefore not simply a lack of studies on FLN. Rather, there is a need for integrated empirical models that measure teacher competencies, observe classroom practices, account for school and contextual conditions, and relate these variables to appropriately measured learner outcomes. The TCFAF is proposed as one such testable model.

THEORETICAL FOUNDATIONS OF THE FRAMEWORK

Piagetian Constructivism

Piaget's constructivist perspective supports the view that children actively construct knowledge through interaction with objects, experiences, and problems. For FLN, this suggests that teachers need to design learning situations in which children manipulate, explore, represent, discuss, and connect ideas. The theory therefore informs the pedagogical component of the framework, but it does not by itself establish that a particular teacher competency produces a measurable FLN gain.

Vygotskian Social Constructivism

Vygotsky's emphasis on social interaction, mediation, and the Zone of Proximal Development explains why teacher scaffolding and peer interaction are important mechanisms in early learning. In the proposed framework, communication, differentiation, guided practice, and feedback are treated as classroom processes through which teacher competence may be enacted.

Bruner's Discovery and Scaffolding Perspective

Bruner's work supports the use of structured exploration, representation, sequencing, and scaffolding. In FLN classrooms, teachers may use stories, manipulatives, examples, questions, and guided discovery to help children move from concrete experience toward increasingly abstract representations.

Shulman's Pedagogical Content Knowledge

Shulman's concept of pedagogical content knowledge provides a direct bridge between teacher knowledge and classroom practice. A teacher may possess mathematical or language content knowledge without necessarily knowing how to represent that content in ways that young learners can understand. PCK therefore informs the framework's distinction between teacher competencies and their classroom enactment.

Hattie's Evidence-Oriented Perspective

Hattie's synthesis of educational influences provides a broader rationale for attending to teacher practices, feedback, and assessment. In the present paper, this evidence is used as a background for identifying potentially important classroom processes, not as proof that the proposed TCFAF variables have a specific causal effect in Indian FLN settings.

Revised Teacher Competency–FLN Achievement Framework (TCFAF)

The revised TCFAF replaces the earlier linear four-stage presentation with a mediated and contextual model. Teacher competencies are positioned as professional resources; classroom practices and learner engagement are proposed as proximal mechanisms; FLN achievement is treated as an outcome; and professional development and structural conditions are represented as enabling or moderating factors. This structure is deliberately framed as a hypothesis for empirical testing rather than a demonstrated causal pathway.

Contextual / Structural Conditions

Language diversity • multigrade teaching • teaching-learning materials • workload • assessment demands • ~~classroom management~~ • ~~teacher training~~ • ~~community context~~

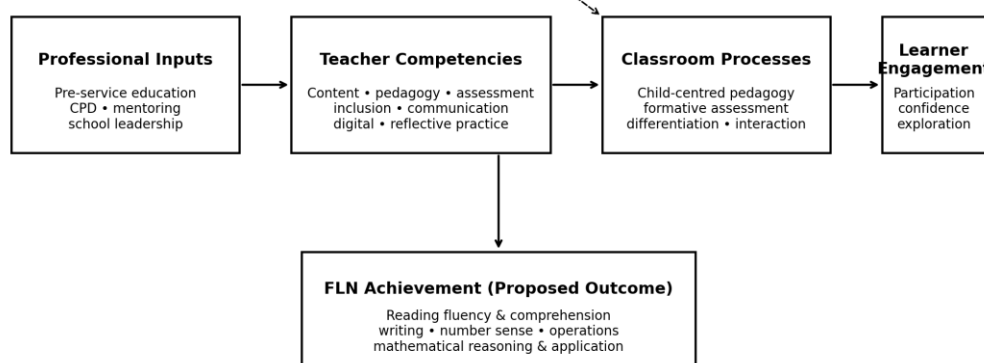


Figure 1. Revised Teacher Competency–FLN Achievement Framework (TCFAF): a conceptual model for empirical testing.

Core Propositions

P1: Higher levels of relevant teacher competency are expected to be associated with greater use of FLN-aligned classroom practices.

P2: FLN-aligned classroom practices are expected to be associated with higher levels of learner engagement.

P3: Learner engagement is expected to be associated with stronger foundational literacy and numeracy outcomes.

P4: Professional development, mentoring, and school leadership may strengthen the translation of teacher competency into classroom practice.

P5: Structural conditions such as workload, language diversity, multigrade teaching, resources, time, and assessment demands may enable or constrain these relationships.

These propositions are intentionally non-deterministic. They specify relationships for empirical investigation and do not claim that teacher competency alone determines learner achievement.

DISCUSSION

The revised literature synthesis suggests that teacher competency should not be conceptualised as an isolated personal characteristic. Competency is enacted within a professional and organisational environment. A teacher may understand play-based pedagogy but have limited opportunities to use it when classroom time is dominated by administrative requirements; similarly, a teacher may possess assessment knowledge but lack practical support for analysing learner evidence and planning remediation. Consequently, the relationship between competence and FLN should be studied as a process of enactment rather than assumed as a direct effect.

A second implication concerns the distinction between policy compliance and pedagogical capability. Completion of an FLN training module demonstrates participation in professional development, but it does not necessarily demonstrate mastery or sustained classroom use. Future research should therefore combine teacher self-report with classroom observation, artefacts, learner work, or other evidence of enacted practice.

A third issue is contextual variation. Foundational classrooms differ by language, geography, school size, multigrade structure, availability of teaching-learning materials, community conditions, and teacher workload. The same competency may therefore be enacted differently across contexts. A national framework should consequently provide common competency expectations while allowing contextual adaptation.

Finally, the reviewed evidence supports a shift from one-time training toward continuous professional learning. NIPUN Bharat's emphasis on mentoring and FLN training is consistent with this direction. However, the effectiveness of professional development depends on design, intensity, follow-up, school-level support, and opportunities to apply learning in real classrooms. Future studies should therefore investigate not merely whether teachers received training, but what changed in their knowledge, practice, and learner evidence after training.

Implications for Teacher Education and Policy

Pre-service teacher education should integrate FLN content, pedagogy, assessment, multilingual education, inclusion, and classroom-based practice rather than treating FLN as a standalone topic.

CPD should include sustained cycles of training, classroom application, observation, feedback, mentoring, and reflection.

Teacher competency frameworks should distinguish knowledge, enacted practice, and professional dispositions so that competency assessment does not rely only on self-report.

School leaders and academic support structures should provide time and mechanisms for collaborative planning, classroom observation, and professional learning.

FLN resources should be adapted to local languages, learner diversity, and multigrade contexts while retaining clear competency expectations.

Assessment systems should generate usable information for instructional decision-making rather than increasing assessment burden without corresponding support.

Digital resources should supplement, not replace, developmentally appropriate interaction, play, language-rich environments, and hands-on mathematics.

Future empirical studies should link teacher-level measures with classroom observations and learner-level FLN assessments.

9. Limitations of the Present Paper

The paper is conceptual and does not report original empirical data.

The reviewed teacher-focused evidence includes local and descriptive studies; therefore, generalisation to all Indian primary schools should be made cautiously.

The proposed relationships in the TCFAF are hypotheses and have not been statistically tested in the present paper.

System-level assessments such as ASER, FLS, and PARAKH measure learner outcomes at scale but cannot, by themselves, establish the causal contribution of individual teacher competencies.

The framework includes major structural conditions, but their relative influence may differ across states, languages, school types, and learner populations.

Future research should use longitudinal, multilevel, mixed-method, or intervention designs to examine the proposed relationships more rigorously.

10. Directions for Future Empirical Research

The framework can be operationalised in future studies through a multilevel design. Teacher competencies may be measured through validated tests, scenario-based tasks, portfolios, and structured self-report instruments; classroom practice may be measured through observation; learner engagement may be assessed through observation and learner-level indicators; and FLN achievement may be measured using validated grade-appropriate assessments. School-level variables such as leadership, resources, teacher workload, language context, and professional support should be included as contextual variables. Such designs would allow researchers to examine whether the proposed pathways are supported and whether the relationships differ across contexts.

For Odisha and similar contexts, future studies could examine whether teacher competencies predict classroom FLN practices after accounting for teacher experience, school characteristics, language, training exposure, and available resources. Longitudinal designs would be particularly valuable for examining whether professional development is associated with sustained changes in practice and learner outcomes.

CONCLUSION

Foundational Literacy and Numeracy is a system-level priority, but its implementation ultimately takes place through everyday interactions between teachers, learners, curriculum, assessment, and learning resources. The evidence reviewed in this paper supports treating teacher competency as multidimensional and contextually enacted. Content knowledge, pedagogy, assessment literacy, communication, inclusion, digital competence, and reflective practice are relevant components of professional capacity for FLN, but their influence should not be assumed to operate independently of structural conditions.

The revised TCFAF therefore presents teacher competencies as professional resources that are translated through classroom processes and learner engagement, with professional development and contextual conditions shaping that translation. The framework is intended as a conceptual and empirically testable model rather than a causal claim. Its principal contribution is to provide a structured basis for future research that connects teacher competency, enacted classroom practice, learner engagement, and foundational learning outcomes within the Indian primary education context.

REFERENCES

1. ASER Centre. (2024). Annual Status of Education Report (Rural) 2024. ASER Centre.
2. Bruner, J. S. (1966). *Toward a theory of instruction*. Harvard University Press.
3. Das, A., & Lenka, S. (2026). Teachers' perceptions and classroom practices regarding foundational literacy and numeracy in primary schools. *International Journal of Emerging Voices in Education*, 2(5), 20–31. <https://doi.org/10.59828/ijeve.v2i5.53>
4. Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute.
5. Gandhi, H. (2021). Preparedness and understanding required for the attainment of foundational numeracy in India. *Voices of Teachers and Teacher Educators*, 10(2), 64–74.
6. Ghosh, A. (2026). *Back to basics? Frontline actors and the implementation of foundational learning reforms in India* [Doctoral dissertation, Harvard University].
7. Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.
8. Ministry of Education, Government of India. (2020). *National Education Policy 2020*.

9. Ministry of Education, Government of India. (2021). NIPUN Bharat: Guidelines for implementation.
10. National Council of Educational Research and Training. (2022). National curriculum framework for the foundational stage.
11. National Council of Educational Research and Training. (2022). Foundational Learning Study 2022.
12. PARAKH, NCERT. (2025). PARAKH Rashtriya Sarvekshan 2024: National report.
13. Piaget, J., & Inhelder, B. (1972). The psychology of the child. Basic Books.
14. Satapathy, D., Sri Divya, V., & Pradhan, D. K. (2025). A study on effectiveness of FLN workbooks developed by SCERT, Odisha, India. Asian Journal of Education and Social Studies, 51(7), 842–854. <https://doi.org/10.9734/ajess/2025/v51i72173>
15. Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. Harvard Educational Review, 57(1), 1–22.
16. Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.