# Theme 4: Beyond FLN and Future Literacies

# NEP 2020: From Policy to Praxis

## Theme 4: Moving Beyond Foundational Skills: The Future of Learning and 21st Century Competencies

Consolidated Extended Abstracts

## 1. Career Guidance for Equitable Transitions: Evidence from the Transition Tracking Survey

By Priyanka Sanghai, Tanushree Das, Priya Agarwal, Swati Mohan and Pallavi R (Antarang Foundation)

**Extended Abstract:**

**Context and Policy Linkage**

Career guidance is increasingly recognised as a pivotal mechanism that facilitates smooth transitions from school to higher education and employment, particularly for adolescents navigating crucial decision points in Grades 10 and 12. Evidence suggests that structured and sustained career counselling not only improves long-term decision-making but also enhances students' self-efficacy, career goal orientation, and ability to align career aspirations with real-world opportunities (Niles & Harris-Bowlsbey, 2018; NITI Aayog, 2022a, 2022b; OECD, 2023; UNESCO, 2023). Studies on school-based career guidance interventions indicate beneficial effects on students' career decision-making abilities, future time orientation, and attitudes towards careers, which are essential components for effective transitions Sharapova et al. (2023). These findings are particularly significant for students from low-income backgrounds, as immediate and contextualised guidance can enhance access to opportunities and diminish reliance on constrained informal networks for career choices.

In alignment with this, the National Education Policy (NEP) 2020 emphasises career guidance and counselling as integral components of education reform. It encourages community and alumni mentors to provide career guidance, suggests clear systems to support informed choices, and emphasises the importance of counselling, especially for students from disadvantaged backgrounds. NEP 2020 also values interactive questionnaires and data-driven tools to help students find their strengths, interests, and areas of focus, thereby enabling more informed career choices (Ministry of Human Resource Development [MHRD], 2020).

This paper explores the impact of a 4-year Career Education Model integrated into government schools from Grades 9-12, to enable marginalised youth to make informed, aspirational transitions into EEET(Education, Employment, Entrepreneurship or Technical Training) in line with NEP 2020. The model is delivered by trained Career Facilitators and builds 21st century skills such as self-awareness, decision-making, communication, adaptation and collaboration via career education. The key components of the program are

- Grade 9-10: exploring interests, aptitudes and over 50 career options while building personalized career plans through classroom sessions and 1:1 counselling.
- Grade 11- 12: developing employability skills and experiential learning through exposure visits, short-term projects, mock interviews, and industry talks.

By linking career readiness competencies with transition percentages, the study provides evidence of NEP-aligned, scalable career education guidance models and assessment tools.

**Research Questions**

1. The Transition Tracking Survey explores several critical questions, including:
2. What percentage of students successfully transition to higher education, vocational training, or employment (EEET) post career education intervention?
3. Are these transitions informed by meaningful career choices, or are they driven by external factors such as economic constraints or societal pressures?

**Methodology and Data Sources**

The Transition Tracking Survey 2025 aimed to capture educational pathways, career aspirations, and challenges faced by students transitioning from secondary to higher secondary education, vocational training, or employment. Conducted by a Mumbai based organisation, the study followed students from Grades 10 and 12 who participated in its career education programs during the 2024–25 academic year across five states- Maharashtra, Rajasthan, Nagaland and, Goa, and Haryana. Using a mixed-methods approach, the research combined quantitative and qualitative data to assess both the scale and quality of student transitions. The survey was conducted in 2025 after six months of the academic year.

The quantitative survey adopted a cross-sectional design with random sampling, covering 1,256 Grade 10 and 956 Grade 12 students across five geographies. Telephonic interviews were conducted and data captured via Kobo Toolbox, ensuring real-time data capture, supervision, and quality checks. The survey assessed transition outcomes, alignment with aspirations, and the influence of the career guidance program on informed decision-making. The verbal consent and assent were obtained from all participants (and from parents or guardians where applicable) prior to the start of each interview. Interviewers clearly explained the study's purpose, voluntary nature, and the right to withdraw at any time without consequence.

Complementing this, six Focus Group Discussions (FGDs) with 33 participants explored deeper contextual insights into students' experiences, barriers, and motivations. Qualitative data were analyzed thematically to interpret patterns emerging from the survey. Together, the findings offer valuable evidence on the effectiveness of structured career guidance models in improving youth transitions supporting the goals of NEP 2020 toward equitable, data-driven education-to-work pathways. Written informed consent was collected from all participants. Participants were assured that their responses would remain anonymous and used solely for research purposes.

**Key Findings/Results**

Transition outcomes for grade 10 and grade 12 for 2024-'25

For the Grade 10 transition it was found that 81.05% of the total students transitioned into higher education, 4.14% to vocational training, and 1.75% did early entry to the work force. At the same time 6.85% did not transition immediately and 6.21% were preparing for a reattempt examination which means a delayed transition not stagnant one.The higher education transition rate (81.05%) is higher than the national average of 75.1% (UDISE+ 2024 to 2025).

For the Grade 12 majority of the students transitioned into higher education (75.0%), 7.9% into vocational training, and 3.9% into work. 10.7% did not transition immediately and 2.6% were preparing for a reattempt examination.

Informed Career choices by the students post grade 10 and grade 12

In the Transition Tracking Survey, career clarity is conceptualized as a two-step process observed across key transition points. Step 1 assesses whether students' career choices align with their interests and aptitudes, reflecting the degree of informed decision-making. Step 2 examines students' immediate post-school plans, capturing the concreteness of their next steps such as pursuing higher education, vocational training, or employment thereby linking aspiration to action.

For Grade 10, 61.8% of students reported an informed career choice where at least one interest or aptitude matched their current aspiration (61.16% females and 62.25% males). Among the grade 12 students, 53.25% reported an informed career choice, where at least one interest or aptitude matched their current aspiration (49.38% females and 56.59%males).

**Policy Implications and Relevance to NEP 2020**

The findings of this study reaffirm the National Education Policy (NEP) 2020 vision of embedding structured career guidance and counselling within school education as a strategy to enhance student retention, informed decision-making, and smoother post-school transitions after Grade 10 and Grade 12 (MHRD,2020). Hooley (2014) highlights that lifelong guidance can support social inclusion by widening awareness of opportunities, strengthening decision making skills, and helping individuals navigate key transition points more effectively. This aligns with NEP 2020's emphasis on providing equitable support to students particularly those from socio-economically disadvantaged backgrounds through structured, systemic approaches that reduce dependence on informal guidance networks.

While NEP 2020 emphasises career guidance and counseling, it provides limited direction on how schools should systematically monitor transition outcomes. Transition tracking survey addresses this gap by offering a scalable framework to assess both transition rates and the quality of post school choices. By combining school-based career education with a structured monitoring system, the Career Education Model demonstrates how NEP 2020's career guidance vision can be operationalised and tracked through measurable transition and career clarity outcomes.

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## 2. Realising the Educational Potential of Citizen Science under NEP 2020: A Framework for Design, Implementation, and Evaluation in Schools

By Anjali Bharati and Dr. VV Binoy (NIAS)

**Extended Abstract:**

**Context and Policy Linkage (NEP 2020)**

The National Education Policy (NEP) 2020 envisions a fundamental shift in Indian school education toward experiential, inquiry-oriented, and competency-based learning. Beyond foundational literacy and numeracy, the policy emphasises the development of scientific temper, critical thinking, problem-solving, and contextual understanding through active engagement with real-world phenomena. To support this shift, NEP 2020 encourages pedagogical approaches that move learning beyond rote instruction and textbook-centred delivery.

Citizen Science (CS) initiatives in schools are increasingly positioned as promising vehicles for advancing these goals. By involving students in scientific processes such as guided observation, structured data collection, and engagement with locally relevant scientific questions, school-based CS appears to align closely with NEP 2020's emphasis on experiential learning and authentic engagement with knowledge. Research on CS in formal K–12 contexts suggests that such initiatives can support student engagement and participation in scientific practices, but that learning opportunities vary substantially depending on pedagogical design and teacher mediation (Tsivitanidou & Ioannou, 2020; Carrier, 2024; Smith, 2025). However, despite the relevance of CS to the current educational reform efforts, discussions on integrating this pedagogy into formal school contexts have not yet gained significant momentum in India.

Translating this potential into meaningful learning outcomes within formal school systems requires careful attention to how programmes are designed, supported, and integrated into everyday teaching and learning. This creates a need for systematic ways of analysing how CS initiatives align with, operationalise, or fall short of NEP 2020's experiential and competency-based learning goals.

This abstract presents a conceptual and methodological contribution aimed at strengthening evidence-informed implementation of experiential learning under NEP 2020. Rather than

evaluating outcomes, it proposes a structured framework to examine how school-based CS initiatives translate policy aspirations into classroom practice, and under what conditions their educational potential can be realised.

**Research Questions**

1. This work is guided by the following research questions:
2. How can school-based CS initiatives be systematically analysed in relation to NEP 2020's goals for experiential and competency-based learning?
3. What design, implementation, and evaluation assumptions shape how CS is enacted in schools, and how can a structured framework support policy-relevant learning at early stages of implementation?

**Methodology and Data Sources**

Methodologically, the study is designed to support the development and application of a framework that makes the alignment between CS initiatives and NEP 2020's pedagogical goals analytically visible.

This contribution is grounded in the development of a conceptual framework informed by policy analysis, prior research, and programme design experience. The framework draws on a close reading of NEP 2020, particularly its sections on experiential learning, scientific temper, and competency-based education, alongside the prior research highlighting the importance of intentional design, teacher roles, and institutional conditions in shaping how CS is enacted in school classrooms (Shirk et al., 2012; Smith, 2025; Carrier, 2024). The framework also builds on the insights from the experiences of developing and implementing CS based initiatives to monitor water resources, explore the impact of climate change on the coastal ecosystem and society. This study presents an integrated framework for the development of content and pedagogy, implementation, and evaluation of school-based CS initiatives suited to Indian school contexts.

**Key Findings/Results (Analytical Insights)**

The framework development process and design experience have yielded several analytical insights that directly inform the research questions. This paper introduces a conceptual framework for examining school-based CS initiatives across three connected stages relevant to policy and practice: design, implementation, and evaluation. These stages reflect patterns identified in prior studies of school-based CS, which document variation in participation

structures, pedagogical integration, and the extent to which evaluation practices are embedded in programme design (Tsivitanidou & Ioannou, 2020; Zydney et al., 2021; Smith, 2025). Rather than treating CS as a uniform intervention, the framework foregrounds how educational intent is shaped and constrained at each stage.

First, content and pedagogical design focus on how scientific content is selected and how participation is structured. This includes the depth of student involvement, ranging from structured data collection to more inquiry-oriented engagement, and the pedagogical strategies used to support observation, questioning, and sensemaking within school settings. This variation has important implications for the kinds of competencies such programmes are likely to support.

Second, pedagogical integration and implementation emerge as critical but often under-specified dimensions. The role of teachers as mediators of learning, alignment with curriculum and assessment practices, and availability of pedagogical support strongly shape how experiential learning is enacted in classrooms. Implementation and equity conditions, including time constraints, teacher capacity, language, and digital access, play a decisive role in determining who can participate meaningfully and how learning opportunities are distributed. These conditions are frequently treated as peripheral rather than central to programme design.

Third, evaluation and evidence-building address how learning processes and programme functioning can be examined at early and mid-stages of implementation. Many initiatives lack clear, feasible tools for early-stage evaluation that align with NEP 2020's competency-oriented goals. Rather than focusing on impact alone, this dimension emphasises appropriate tools for formative evaluation, including process documentation, participation structures, teacher reflections, student artefacts (e.g., observation records or reflective outputs), and alignment with curricular competencies articulated under NEP 2020. This enables more realistic and context-sensitive assessment of whether programmes are progressing toward NEP 2020's pedagogical goals.

Together, these dimensions provide a structured way to move from policy aspiration to grounded analysis, making visible the mechanisms through which experiential learning initiatives under NEP 2020 generate, limit, or unevenly distribute educational opportunities.

**Policy Implications and Relevance to NEP 2020**

Existing research on school-based CS has largely focused on individual projects or

classroom-level implementations, documenting variation in teacher approaches, student participation, and learning opportunities (Carrier, 2024; Smith, 2025; Tsivitanidou & Ioannou, 2020). While these works provide valuable insights, it offers limited guidance for policymakers seeking to assess alignment with system-level reforms such as NEP 2020. The framework presented here builds on these studies by organising their insights into a coherent design–implementation–evaluation structure that is legible to policy actors. In doing so, it translates dispersed research findings into an analytical tool that can support evidence-informed decision-making, early-stage evaluation, and responsible scaling of experiential learning initiatives within Indian school systems. The framework offers a practical tool for policymakers, SCERTs, DIETs, NGOs, and programme designers seeking to strengthen experiential learning initiatives under NEP 2020. By explicitly linking content and pedagogy development, implementation conditions, and evaluation, it supports more realistic and context-sensitive decision-making.

It enables a more nuanced understanding of how experiential learning approaches can be adapted to different schooling realities, helping to identify pathways for strengthening implementation rather than simply evaluating outcomes. Rather than asking whether CS "works," the framework helps policy actors ask how initiatives can be better designed, supported, and evaluated to align with NEP 2020's equity, quality, and systems-transformation goals. It also provides a foundation for developing policy briefs, implementation checklists, and diagnostic tools that can guide scaling while remaining attentive to institutional capacity and local context. By addressing both how CS initiatives can be analysed in relation to NEP 2020 and how underlying design and implementation assumptions shape practice, the framework supports more grounded and responsible policy decision-making.

In doing so, this work contributes to the symposium's emphasis on moving from policy aspiration to grounded praxis, offering a pathway for generating evidence that is both analytically rigorous and policy relevant.

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## 3. CS and AI Education as Foundations for 21st-Century Competencies: Insights from the State of CS & AI Education Study in US

By Saiprasad Sale and Prabhjot Kaur (Code.org)

**Extended Abstract:**

**Context & Policy Linkage (to NEP 2020)**

As societies increasingly rely on digital and algorithmic systems, education systems are re-examining the role of computer science (CS) and artificial intelligence (AI) in developing learners' capacities for problem-solving, logical reasoning, creativity, and adaptability. NEP 2020 reflects this global shift by emphasising computational thinking, experiential learning, and flexible curricular pathways that prepare learners for an evolving future.

Within Theme 4: Moving Beyond Foundational Skills, CS and AI education are increasingly viewed not merely as technical subjects, but as vehicles for cultivating higher-order competencies central to 21st-century learning. The State of CS & AI Education report published by the Code.org Advocacy Coalition provides a comprehensive overview of how CS and AI education are being positioned within education systems, highlighting trends related to curriculum, teacher preparation, participation, and equity.

This paper presents a high-level synthesis of insights from the report, connecting them to NEP 2020's emphasis on competency-based and future-oriented education. The intent is not to evaluate or replicate the report's findings, but to interpret its key messages for broader policy conversations on advancing learning beyond foundational skills.

**2. Research Question(s)**

This paper addresses the following synthesis-oriented questions:

1. How does the State of CS & AI Education report frame CS and AI education as contributors to 21st-century competencies?
2. What system-level conditions are highlighted as influencing access to and quality of CS and AI learning?
3. What implications do these insights hold for education systems seeking to align CS and AI education with the goals articulated in NEP 2020?

**Methodology & Data Sources**

The paper uses a descriptive and analytical review methodology, drawing exclusively on secondary data from the State of CS & AI Education report and related policy documentation.

**The analytical process involved:**

- **Extraction of Key Indicators:**
    - Relevant sections of the report were reviewed to identify indicators related to curriculum standards, participation trends, teacher preparation, and equity considerations in CS and AI education.
- **Thematic Categorisation:**
    - Extracted information was categorised under themes aligned with Theme 4, including competency development, pedagogy, teacher capacity, and access.
- **Policy Interpretation:**
    - These themes were interpreted in relation to NEP 2020's priorities, focusing on conceptual relevance rather than direct applicability or outcome measurement.
    - The methodology is intentionally transparent and interpretive, aimed at presenting the report's insights in a policy-relevant manner.

**Key Findings/Results**

The synthesis highlights several consistent patterns. In particular, the findings on access, teacher preparation, and participation gaps offer important lessons for states attempting to move beyond pilot initiatives toward systemwide adoption.

A. **CS and AI as Core Learning Domains:**
    - The report positions CS and AI education as central to developing computational thinking and structured problem-solving, rather than as optional or peripheral subjects.
B. **Importance of Curriculum Clarity:**
    - Clear learning expectations and standards support more consistent implementation and help situate CS and AI within broader learning goals.
C. **Teacher Preparation as a Critical Enabler:**
    - Teacher professional learning emerges as a key factor influencing classroom practice and learner outcomes in CS and AI education.
D. **Equity as an Ongoing Challenge:**
    - Participation gaps persist across contexts, highlighting the need for

intentional design when scaling advanced competencies.

**Policy Implications & Relevance to NEP 2020**

The insights from the State of CS & AI Education report reinforce NEP 2020's call for education systems that cultivate higher-order competencies through coherent curriculum design, teacher capacity building, and equitable access. The synthesis underscores that CS and AI education are most effective when framed as contributors to broader learning goals rather than isolated technical pathways.

By situating these insights within Theme 4, the paper contributes to policy discussions on how education systems can move beyond foundational skills toward deeper, future-focused learning aligned with NEP 2020's vision.

## 4. Beyond Platforms and Access: Teacher Capability, Institutional Capacity, and AI Readiness under India's National Education Policy 2020 By Tushar Kaushik (University College London)

**Extended Abstract:**

**Context and Policy Linkage**

NEP 2020 highlights teacher education and institutional strength as key drivers of systemic reform. The policy emphasises continued professional development (CPD), the revamp of public teacher training bodies like SCERT and DIET in the form of platforms like DIKSHA, and the strategic deployment of digital tools to improve quality, equity, and reach. In this framework, teachers are viewed not just as the reform implementers but as active professional agents responsible for pedagogical innovation within a transformed governance and training landscape.

At the same time, NEP 2020 advances an ambitious digital agenda, in which emerging technologies are increasingly positioned as enablers of personalised learning, improved assessment, and instructional efficiency. However, while the policy articulates a normative commitment to technology-enabled transformation, it provides very limited specification of the professional capabilities and ethical safeguards required for teachers to engage with technology (including AI) in pedagogically sound and socially responsible ways.

This ambiguity seems to reflect an implicit policy logic within NEP 2020. That teacher's capability in emerging technologies will evolve organically through scale, access to digital platforms, and exposure to innovation. With this logic, competency development appears to be assumed to follow from participation in digitally mediated programmes, rather than from clearly articulated professional standards supported by sustained institutional capacity. This assumption is consequential in a system of uneven administrative capacity, variable infrastructure, and historically fragmented approaches to teacher development.

Global frameworks such as UNESCO's Artificial Intelligence Competency Framework for Teachers (AICFT) have defined the knowledge, skills, and ethical orientations teachers require to work with AI. Yet there is limited empirical evidence on how such global frameworks align with India's policy ecosystem and teachers' lived professional realities.

This study reframes AI-related teacher preparedness not as a question of technological adoption, but as an implementation and institutional capacity challenge embedded within

NEP 2020's teacher education reforms. The study analyses policy texts and teacher perceptions to locate where AI-related professional expectations exceed existing institutional capacity.

**Research Questions**

1. Adapted from a broader post-grad inquiry and reframed for the purposes of policy analysis under NEP 2020, this study addresses the following research questions:
2. How do national education policy and programme documents in India conceptualise teacher preparedness for technology-enabled teaching and learning?
3. What individual, institutional, and systemic factors shape teachers' perceived readiness to engage with artificial intelligence in pedagogically and ethically responsible ways?
4. How do teachers prioritise different dimensions of AI-related competence, and where do gaps between perceived importance and self-assessed competence become evident?
5. What implications do these patterns have for the design of teacher professional development and the strengthening of public teacher education institutions under NEP 2020?

Together, these questions position teacher competence as a systemic outcome rather than as an individual attribute or a by-product of technological exposure.

Methodology

The study adopts a mixed-methods design combining documentary policy analysis with quantitative survey data from in-service teachers in India.

First, a structured documentary analysis was conducted of key national policy and programme documents associated with NEP 2020 implementation, including documents related to teacher professional development, digital education initiatives, and technology-enabled governance. This analysis examined how AI, digital pedagogy, ethics and teacher capacity are framed, with particular attention to whether explicit teacher-facing competency expectations are articulated.

Second, a cross-sectional survey was administered to 139 in-service teachers across varied educational contexts. The survey instrument was adapted from AICFT and covered domains including Ethics of AI, AI for Professional Development, AI Pedagogy and Human-centred

AI. Respondents rated both the perceived importance of specific AI-related competencies and their self-assessed competence, enabling systematic comparison between aspiration and preparedness.

Quantitative analysis included descriptive statistics, Kaiser-Meyer-Olkin (KMO) and Bartlett's tests to assess factorability, exploratory factor analysis to identify latent structures in teachers' conceptualisation of AI competence, and gap analysis comparing perceived importance and competence across domains.

The study is subject to methodological limitations, including reliance on self-reported data and a non-random sample. However, the survey data demonstrated significant factorability (KMO > 0.80; Bartlett's test $p < 0.001$), supporting the robustness of the underlying constructs examined.

**Key Findings**

Four findings emerge with direct relevance for teacher education reform and institutional capacity-building under NEP 2020:

First, policy articulation of teacher competence remains broad and underspecified.

While the national policy and programme documents strongly emphasise digital innovation and technology-enabled learning, they rarely outline what teachers are expected to know or do with AI in classroom instruction, assessment, or professional decision-making. Ethical considerations such as data privacy, bias, and professional judgment are largely missing, placing a significant interpretive burden on implementing institutions and individual teachers.

Second, teachers report high perceived importance of AI-related competencies alongside minimal formal training exposure. Across all domains, respondents consistently rated AI-related competencies as important for future teaching practice, particularly in instructional support. However, most reported little or no engagement with structured professional development focused on AI. This indicates a substantial readiness-support gap.

Third, the most pronounced competence gaps relate to ethics and pedagogical integration rather than basic technical operation. Teachers expressed particular uncertainty around issues such as algorithmic bias, data protection, and appropriate pedagogical use of AI tools. This challenges policy assumptions that infrastructure provision or basic digital literacy training may be enough.

Fourth, teachers conceptualise AI readiness as a holistic professional capability. Exploratory factor analysis reveals that ethical awareness, pedagogical judgment, and assessment practices cluster together in teachers' perceptions of AI competence. This suggests that teachers do not view AI as a discrete technical skill, but as an integrated aspect of professional practice.

Collectively, these findings point to a misalignment between NEP 2020's current policy instruments (platform-based) and the integrated forms of professional capability required for responsible AI use.

**Relevance to NEP 2020**

The findings generate several implications for NEP 2020 implementation, particularly in relation to teacher professional development and institutional capacity-building.

First, AI-related teacher professional development should be conceptualised as sequenced capability-building rather than rapid skill acquisition. Ethical reasoning and pedagogical judgment must precede large-scale deployment of AI tools, aligning with NEP 2020's emphasis on values-based education and teacher professional autonomy.

Second, institutions like SCERTs and DIETs need to function as governance and capability anchors, not merely as delivery channels for centrally designed digital content. These institutions are uniquely positioned to contextualise ethical norms, mediate pedagogical interpretation, and sustain professional learning communities over time.

Third, NEP 2020 implementation would benefit from the development of basic governance routines around AI use in schools. These include ethical safeguards, guidance on procurement and deployment, and mechanisms for professional deliberation and reporting. Such routines can enable innovation while mitigating risks associated with unregulated or uneven adoption.

Finally, the findings underscore the need for a contextualised, implementation-oriented adaptation of global AI competency frameworks for teachers. The evidence suggests that competency expectations must evolve through policy learning grounded in India's institutional capacities and professional development systems.

**Conclusion**

This study contributes to evidence-based discussions on how emerging technologies can

be integrated into Indian education systems in ways that advance equity, quality, and sustainable reform. It demonstrates that AI-related teacher preparedness under NEP 2020 cannot be assumed to emerge through access, scale, or platforms alone. Instead, it requires deliberate institutional investment.

## 5. Piloting AI-enabled Competency-based Assessment and Public Disclosure at School Level in Jodhpur: A Case Study

by Dr. Geetika Bhandari, Kavita Malik, Purvi Goyal, Ann Ria Reji, Komal Kasera (Central Square Foundation)

**Extended Abstract:**

**Context & Policy Linkage (to NEP 2020)**

School readiness, or a child's preparedness to thrive in Grade 1, depends heavily on learning and development that happens before age 6, a period during which more than 85% of brain development occurs (Gilmore, J. H., Knickmeyer, R. C., & Gao, W., 2018). India's National Education Policy (NEP) 2020 recognises this by positioning early childhood education (ECE) as the first step towards foundational literacy and numeracy, defining the foundational stage as ages 3 to 8. Building on this, the National Curriculum Framework for the Foundational Stage (NCF-FS, 2022) lays out sequenced learning outcomes across five developmental domains and positions routine assessment as a driver of improved classroom practice and policy for school readiness.

Presently, for ages 6 and below, India relies on independent or small-scale assessment evidence to understand early learning and school readiness. For example, the India Early Childhood Education Impact Study (India Early Childhood Education Impact Study [IECEI], 2017) and ASER's Early Years (ASER Centre, 2019). While influential, these studies are (i) not representative and (ii) conducted prior to universalisation of FLN in India in 2020, painting a partial picture of systemic reforms for school readiness that have followed since.

Even so, regular and large-scale ECCE evidence on how school-ready children are remains limited. School Readiness Measurement tools often require substantial adaptation to local contexts to ensure they capture child development rather than contextual differences, and they demand intensive assessor training and calibration to preserve reliability. Further, direct child assessments can be time-consuming and material-intensive, which creates practical constraints for frequent and routine administration at scale (UNESCO, UNICEF, Brookings Institution, & World Bank, 2017).

This paper examines, both practically and methodologically, what is required to measure school readiness in India in a manner that is both NEP-aligned and system-feasible. The central question is not only what to measure, but how to measure it reliably under routine constraints. The paper therefore poses the following research questions focused on

instrument adaptation, on-ground feasibility, and NEP-aligned enabling conditions.

**Research Questions**

1. Measurement validity for policy use: To what extent can an adapted early childhood assessment instrument meaningfully assess school readiness among 5–6-year-olds?
2. Implementation constraints and data quality: Which on-ground operational constraints most strongly affect fidelity, comparability, and scalability of readiness measurement?
3. System design for NEP alignment: What institutional mechanisms are required to integrate readiness measurement into routine foundational-stage governance under NEP 2020?

**Methodology & Data Sources**

I. Tool selection and adaptation approach

Stages of Tool Adaptation

1.Document/Landscape Review

2.Item Review and Modification

3.Tool Pilot

4.Tool refinement & Finalisation

A landscape review of global and Indian early-learning assessment tools was conducted to identify an instrument aligned with India's competency frameworks while retaining relevance and measurement credibility. The review considered widely used international and national measures, such as IDELA, the World Bank, ASER Early Years, and Azim Premji University's Early Learners Assessment. The review concluded that no single existing tool fully captured the competencies essential for school readiness in a manner that was also feasible for regular administration at scale. This gap motivated the development of an adaptation pathway to create a 'School Readiness Instrument' for children aged 5 to 6 that enables timely, actionable evidence for school readiness at scale.

Azim Premji University's Early Learners Assessment (ELA) was selected as the most

promising base given its evidence-based design, open-access availability, NCF alignment, prior field use in India, and customisability for state contexts.

Crucially, ELA is designed as a performance-based diagnostic and interactive assessment. The University notes that administering the assessment can take about an hour, potentially spread across two days by two assessors.

While these design features support rich diagnostic profiling within the 3–5 age band, they pose constraints for time-bounded, frequent school-readiness measurement intended to capture preparedness of ages 5-6 for the transition into Grade 1 at scale.

Accordingly, the adaptation strategy focused on :

1. Mapping and aligning items to NCF-FS
2. Streamlining operational and logistical challenges
3. Refining task design and scoring rubrics

II. Pilot design and field implementation

Two iterative pilots were undertaken to test

1. Whether the adapted tool was measuring intended constructs in the target age group for school readiness and
2. Whether it could be implemented with fidelity in real Anganwadi conditions.

**Pilot 1 (Aligarh):** A small-scale trial in 7 Anganwadis covering 23 children (age 5+) tested item clarity, child engagement, and early performance patterns. The pilot also served as an early check on whether tasks exhibited floor/ceiling tendencies and whether scoring rubrics captured meaningful progression within 5-6-year-olds.

**Pilot 2 (Ghaziabad):** This pilot tested the tool at a larger scale across 101 Anganwadis with 249 children to surface operational constraints and performance trends. Twenty-four items mapped to age-wise competencies were tested, and 21 ECE kits were prepared at a cost of up to ₹1,200 per kit. Data were collected by 21 field investigators, supported by a 3-day training and planning process to assess implementation constraints. Two data-capture modes were tested, a survey booklet and the Tangerine platform, to assess the feasibility of rapid technology-enabled data collection.

**Key Findings/Results**

1. **Measurement Validity: Does the adapted tool capture the school readiness of children?**

   Findings from the Aligarh pilot indicated that the adapted tasks elicit meaningful variation in performance among the school-readiness age group (5-6 years). Across both pilots, the assessment also enabled a structured examination of how children completed tasks with varying levels of assessor support (e.g., verbal cues, repeated instructions, or physical demonstrations), particularly more difficult items.

2. **Implementation - What operational factors most strongly shape fidelity, reliability, and comparability?**

   Operational constraints strongly affected feasibility and consistency. Administration time exceeded 60 minutes per child, leading to fatigue and lower engagement. Assessors sometimes skipped or reordered activities to increase coverage, which reduced comparability across children and centres.

   A second constraint was the need for training and scoring consistency. Because administration requires structured prompting and rubric-based scoring, intensive practice and strong calibration routines are needed to reduce inter-rater variability.

   Third, material requirements constrained feasibility. The kit was relatively costly and difficult to source, and set up increased manpower needs, sometimes requiring two people per child.

3. Designing for scale - What adaptations are required to make school readiness measurement operationally viable?

   The pilots identified three sets of adaptations necessary for readiness measurement to be viable for routine implementation while remaining aligned with foundational-stage competency expectations.

   First, the instrument requires deliberate streamlining to reduce administration time. Recommended changes include removing low-yield items, bundling tasks using shared and print-friendly stimuli, and mapping tasks to fewer competencies.

Second, assessor training requires redesign toward hands-on demonstration and extensive monitoring.

Third, a leaner kit design combined with phone-based data collection, such as Tangerine, can also reduce the human resource intensity of assessment by lowering setup time, handling complexity, and the need for additional logistical support.

**Policy Implications and Relevance to NEP 2020**

The findings underscore that school readiness measurement is not merely a technical exercise in tool selection, but a set of design choices that determine feasibility, fidelity, and use.

First, school readiness measurement should be institutionalised as a routine component of foundational-stage monitoring rather than remaining episodic or pilot-driven.

Second, readiness measurement must be designed as a curriculum-linked and implementation-ready assessment using low-cost, print-friendly stimuli and rapid administration and capacity building protocols.

Building on these insights, Central Square Foundation (CSF) developed a streamlined, print-friendly school-readiness instrument for children aged 5–6 that can be administered in approximately 20 minutes by a single assessor and is contextualised for Uttar Pradesh. The revised tool is intended to support routine readiness measurement at the point of transition into Grade 1 and will be piloted across 70,000+ co-located Anganwadis.

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