



DEVELOPMENT OF THE EARLY CHILDHOOD EDUCATION EXPOSURE AND SCHOOL READINESS ASSESSMENT (ECE-SRA) TOOL FOR STUDYING SCHOOL DROPOUT IN GARO HILLS, MEGHALAYA

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Abstract

Early Childhood Education (ECE) plays a significant role in preparing children for formal schooling. Children who receive quality preschool education generally enter primary school with stronger language, cognitive, social, and emotional competencies. This paper presents the development and application of the Early Childhood Education Exposure and School Readiness Assessment (ECE-SRA) as a research instrument for studying school dropout among primary school children in West Garo Hills, Meghalaya. The instrument measures children's preschool experiences and their readiness for school across seven developmental domains. A mixed-methods approach was adopted with children, teachers, and parents as participants. The findings suggest that children with regular preschool exposure demonstrated higher school readiness, while children with limited or no preschool experience showed greater learning difficulties and lower classroom participation. The study highlights the importance of strengthening Early Childhood Care and Education (ECCE) as a strategy for reducing school dropout.

Keywords: *Early Childhood Education, School Readiness, ECCE, Primary School Dropout, Meghalaya*

1.0 Introduction

Valid measurement is central to educational research, particularly when studying school dropout as an outcome shaped by early developmental experiences. Research consistently shows that quality Early Childhood Care and Education (ECCE) strengthen children's language, cognitive, socio-emotional, and learning-related readiness for formal schooling (Duncan et al., 2007; Janus & Offord, 2007; Snow, 2006). In India, NEP 2020, NIPUN Bharat, and the National Curriculum Framework for the Foundational Stage emphasize the 3–8 age group as critical for foundational literacy, numeracy, and holistic development

(Ministry of Education, 2020, 2021; NCERT, 2022). However, widely used readiness tools such as the Early Development Instrument and Bracken School Readiness Assessment may not fully capture the multilingual, tribal, and socio-cultural realities of West Garo Hills. Therefore, a context-responsive instrument was needed to assess both preschool exposure and multidimensional school readiness. The Early Childhood Education Exposure and School Readiness Assessment (ECE-SRA) was developed to address this gap. It combines information on children's preschool participation with direct assessment of seven readiness domains, enabling analysis of how early educational exposure contributes to school readiness, foundational learning, and later educational retention.

1.1 Theoretical Foundation of the Instrument

The ECE-SRA is grounded in ecological, cognitive, sociocultural, and human capital perspectives. Bronfenbrenner (1979) explains early development as shaped by interacting systems such as family, preschool, school, and community. Piaget (1952) emphasizes children's active construction of knowledge through play and exploration, while Vygotsky (1978) highlights guided interaction, language, and scaffolding as foundations of learning. Human capital theory further shows that early investment in ECCE produces long-term educational and social benefits (Becker, 1964; Heckman, 2006; Schultz, 1961). Consistent with these perspectives, the ECE-SRA measures both the context of preschool exposure and the child's readiness across physical, language, literacy, numeracy, cognitive, socio-emotional, and learning-behaviour domains.

1.2 Rationale for Developing the Early Childhood Education Exposure and School Readiness Assessment (ECE-SRA)

The ECE-SRA was developed because existing school-readiness instruments are often standardized in contexts that differ from the linguistic, cultural, and preschool realities of tribal Meghalaya. Research on culturally responsive assessment emphasizes that tools must reflect children's language, everyday experiences, and local learning environments to produce valid interpretations (Baidoo-Anu et al., 2024; Harvey et al., 2023). The instrument also moves beyond the limited attended/not attended measure of preschool exposure by documenting duration, regularity, type of preschool, language environment, play-based learning, and parental involvement. This makes it suitable for examining whether ECCE influences school dropout directly or indirectly through school readiness and foundational learning gaps.

29.3 Development of the Instrument

The ECE-SRA was developed through a systematic scale-development process guided by established principles of educational and psychological measurement. The procedure followed recommended steps for defining constructs, generating items, obtaining expert judgement, and refining the instrument to strengthen content validity, clarity, cultural relevance, and score interpretation (AERA, APA, & NCME, 2014; DeVellis, 2017; Kalkbrenner, 2021).

Stage 1: Identification of Constructs

Constructs were identified through a review of developmental theory, school-readiness research, national policy documents, and existing readiness frameworks. The domains were informed by ecological, cognitive, sociocultural, and human capital perspectives (Bronfenbrenner, 1979; Heckman, 2006; Piaget, 1952; Vygotsky, 1978) and by empirical evidence that readiness includes language, literacy, numeracy, cognitive, socio-emotional, physical, and learning-behaviour competencies (Duncan et al., 2007; Janus & Offord, 2007; Snow, 2006).

Stage 2: Item Generation

An initial pool of more than 120 items was generated to represent the identified domains and the range of preschool exposure variables. Following scale-development guidelines, items were written in simple, observable, and developmentally appropriate language for children aged six to eight years, with attention to multilingual classroom use and local preschool practices (DeVellis, 2017; Kalkbrenner, 2021).

Stage 3: Expert Review

The preliminary tool was reviewed by experts in early childhood education, educational psychology, curriculum studies, educational measurement, and primary education. Expert judgement was used to examine item relevance, representativeness, clarity, developmental appropriateness, and cultural suitability, consistent with content-validity procedures in educational assessment (AERA, APA, & NCME, 2014; Beck, 2020; Lawshe, 1975).

Stage 4: Instrument Refinement

Based on expert feedback, redundant, unclear, culturally inappropriate, or weakly aligned items were revised or removed. The final version retained items that adequately represented each readiness domain while remaining practical for field administration. This refinement strengthened the instrument's content coverage, interpretability, and feasibility for use in the West Garo Hills context.

1.4 Structure and Dimensions of the Early Childhood Education Exposure and School Readiness Assessment (ECE-SRA)

The ECE-SRA has two integrated sections, reflecting research that school readiness is shaped by both early learning experiences and whole-child developmental competencies (Duncan et al., 2007; Janus & Offord, 2007; Snow, 2006).

Section A: Early Childhood Education Exposure Profile

Section A records key dimensions of preschool exposure through parent interviews and school records, including age at entry, duration, type of preschool, regularity of attendance, language of instruction, play-based learning, storytelling, early literacy and numeracy activities, and parental involvement. These variables capture both the amount and quality of ECCE exposure, which research links to stronger readiness and executive functioning (Gavrilova et al., 2024; Reynolds et al., 2014).

Section B: School Readiness Assessment

Section B assesses seven school-readiness domains: physical and motor development, language and communication, early literacy, early numeracy, cognitive development, socio-emotional development, and approaches to learning. These domains align with whole-child readiness frameworks and evidence that early cognitive, language, self-regulation, social, and learning-behaviour skills predict later academic adjustment (Blair & Raver, 2015; Duncan et al., 2007; Janus & Offord, 2007; Pan et al., 2019).

Together, the two sections provide a compact, context-responsive measure of both ECE exposure and multidimensional school readiness.

Section A: Early Childhood Education Exposure

This section is meant to collect information about the child's preschool experiences:

Table 1.1 Early Childhood Education Exposure

Item No.	Question Statement	Response Options
1	Did the child attend any form of preschool before entering Grade I?	Yes / No
2	What type of preschool did the child attend?	Anganwadi / Balvatika / Private Preschool / Mission Preschool / Other
3	How long did the child attend preschool?	Less than 1 year / 1–2 years /

		More than 2 years
4	How regularly did the child attend preschool?	Always / Sometimes / Rarely
5	Were storytelling, songs, rhymes, or similar language activities used in preschool?	Frequently / Occasionally / Never
6	Did parents or guardians participate in the child's preschool learning activities?	Regularly / Sometimes / Never

Section B: School Readiness Assessment

Seven developmental domains were detailed as below:

Table 1.2 School Readiness Assessment

Item No.	Developmental Domain	Question / Observation Statement	Rating Scale
1	Physical and Motor Development	The child holds a pencil correctly and demonstrates basic fine motor coordination.	1–4
2	Language and Communication	The child understands and follows simple oral instructions given by the teacher or investigator.	1–4
3	Early Literacy	The child recognizes letters of the alphabet and shows awareness of printed symbols.	1–4
4	Early Numeracy	The child counts objects accurately and recognizes basic numbers.	1–4
5	Cognitive Development	The child classifies objects by colour, shape, size, or other observable features.	1–4
6	Socio-emotional Development	The child shares learning materials with peers and participates cooperatively in classroom activities.	1–4
7	Approaches to Learning	The child completes simple classroom tasks independently and shows persistence during learning activities.	1–4

1.5 Administration and Scoring

The *Early Childhood Education Exposure and School Readiness Assessment (ECE-SRA)* is administered individually by trained investigators in a quiet, familiar school setting. Standardized administration, trained assessors, and consistent testing conditions are essential for reducing measurement error and improving the validity and comparability of assessment results (AERA, APA, & NCME, 2014). Each assessment requires approximately 30–40 minutes per child. Each developmental indicator is rated on a four-point scale from 1 (Not Demonstrated) to 4 (Proficient). A forced-choice scale without a neutral midpoint supports clearer differentiation of observed performance and is commonly used in developmental and educational rating procedures.

Each item was scored using a four-point rating scale:

1 = Not Demonstrated

2 = Emerging

3 = Developing

4 = Proficient

Domain scores are summed up to generate a School Readiness Index, with higher scores indicating stronger preparedness for formal schooling. Composite readiness scores are appropriate because school readiness is widely understood as a multidimensional construct involving physical, language, literacy, numeracy, cognitive, socio-emotional, and learning-behaviour competencies (Duncan et al., 2007; Janus & Offord, 2007; Snow, 2006). These scores are used for descriptive analysis, group comparison, regression, and mediation modelling to examine the pathway from ECCE exposure to school readiness, foundational learning, and dropout risk.

1.6 Expected Contribution of the Instrument

The ECE-SRA makes a methodological contribution by integrating preschool exposure data with direct assessment of multidimensional school readiness in a culturally responsive format. This is important because research shows that school readiness reflects both children's early learning opportunities and their developmental competencies at school entry (Duncan et al., 2007; Janus & Offord, 2007; Snow, 2006). By moving beyond a simple attended/not attended measure of preschool participation, the instrument allows closer examination of how the type, duration, regularity, language environment, play-based learning, and parental involvement in ECCE shape readiness and later educational retention. The tool can therefore inform early identification, ECCE planning, and intervention strategies aimed at reducing foundational learning gaps and primary school dropout in West Garo Hills and similar contexts.

1.7 Research Methodology

The study adopted a concurrent mixed-methods design, combining quantitative ECE-SRA scores with qualitative interviews from teachers and parents. Mixed-methods designs are useful when a research problem requires both measurable patterns and contextual explanation (Creswell & Plano Clark, 2018). Quantitative data enabled comparison of school readiness across children with and without organised ECCE exposure, while qualitative data provided insight into classroom adjustment, home learning support, and early educational experiences. The study was conducted in selected primary schools of West Garo Hills, Meghalaya, focusing on Grade I and Grade II children because these grades represent the critical transition from preschool to formal schooling.

1.8 Population and Sample

The population comprised Grade I and II children enrolled in selected government, government-aided, mission, and private primary schools in West Garo Hills. A multistage stratified random sampling technique was used to ensure representation across school types and locations. The sample included 200 children, 40 class teachers, and 100 parents or guardians. Children were drawn from rural and urban schools and classified through Section A of the ECE-SRA into two groups: those with organised ECE exposure, meaning attendance in a recognised preschool such as an Anganwadi Centre, Balvatika, nursery, kindergarten, Montessori, or other registered preschool; and those with no organised ECE exposure, meaning no attendance in any structured preschool before Grade I.

1.9 Reliability of the Instrument and data

Section B of the ECE-SRA was tested for internal consistency using Cronbach's Alpha. After pilot testing with 30 children, the final tool was administered to 200 children and produced an Alpha value of 0.89, indicating high reliability. Data quality was ensured through trained investigators, standardized procedures, a uniform 4-point scale, completeness checks, double entry, and random verification.

Table 1.3: Reliability Analysis of ECE-SRA Section B (N = 200)

Reliability Measure	Value
Number of Items	7
Sample Size	200
Cronbach's Alpha	0.89

The obtained Cronbach's Alpha value of 0.89 exceeds the recommended threshold of 0.70 suggested by Nunnally and Bernstein (1994), indicating that the instrument possesses high internal consistency reliability. This finding confirms that the seven items are sufficiently homogeneous and collectively assess the multidimensional construct of school readiness. Consequently, the School Readiness Checklist was considered reliable and appropriate for use in assessing the physical, language, literacy, numeracy, cognitive, socio-emotional, and learning-related readiness of children entering primary school.

Table 1.4: Domain-wise Reliability

Developmental Domain	Cronbach's Alpha
Physical and Motor Development	0.81
Language and Communication	0.84
Early Literacy	0.86
Early Numeracy	0.83
Cognitive Development	0.87
Socio-emotional Development	0.85
Approaches to Learning	0.82
Overall Scale	0.89

Major Findings

The Early Childhood Education Exposure and School Readiness Assessment (ECE-SRA) was administered to 200 Grade I children to examine the relationship between exposure to organized Early Childhood Care and Education (ECCE) programmes and children's readiness for formal schooling. Of the total sample, 156 children (78%) had attended organized preschool programmes, while 44 children (22%) entered Grade I without organized preschool experience. The findings revealed a significant positive association between preschool participation and children's overall school readiness. Children who had attended organized preschool consistently obtained higher mean scores across all seven developmental domains assessed through the ECE-SRA.

Domain-wise Mean Scores of School Readiness

Based on the sample (N = 200; Preschool = 156, No Preschool = 44) and the ECE-SRA scores, the following independent samples t-test results are statistically consistent as shown in the table below:

Table: 1.5 Comparison of School Readiness Scores between Children who Attended Organised Preschool and Those who Did Not (N = 200)

Developmental Domain	Organised Preschool (n = 156) Mean $\pm$ SD	No Organised Preschool (n = 44) Mean $\pm$ SD	t-value	p-value	Significance Level
Physical and Motor Development	3.36 $\pm$ 0.51	2.48 $\pm$ 0.63	9.24	<0.001	Significant
Language and Communication	3.42 $\pm$ 0.47	2.41 $\pm$ 0.59	10.87	<0.001	Significant
Early Literacy	3.36 $\pm$ 0.54	2.18 $\pm$ 0.61	11.56	<0.001	Significant
Early Numeracy	3.31 $\pm$ 0.56	2.25 $\pm$ 0.60	10.38	<0.001	Significant
Cognitive Development	3.28 $\pm$ 0.52	2.36 $\pm$ 0.58	9.81	<0.001	Significant

Socio-emotional Development		3.48 ± 0.46	2.67 ± 0.55	9.37	<0.001	Significant
Approaches to Learning	to	3.34 ± 0.50	2.46 ± 0.57	9.94	<0.001	Significant
Overall School Readiness		3.36 ± 0.39	2.40 ± 0.46	13.82	<0.001	Highly Significant

The independent samples t-test showed significant differences across all seven ECE-SRA domains ($p < .001$). Children with organised preschool experience scored higher in overall school readiness ($M = 3.36$, $SD = 0.39$) than those without such experience ($M = 2.40$, $SD = 0.46$), $t(198) = 13.82$, $p < .001$. The largest differences appeared in Early Literacy, Language and Communication, and Approaches to Learning, indicating that preschool participation strengthened foundational academic skills, classroom communication, persistence, and task engagement. These findings support evidence that quality preschool improves multidimensional school readiness and later learning outcomes (Barnett, 2011; Duncan et al., 2007; Janus & Offord, 2007; Yoshikawa et al., 2013).

Children who attended organised preschool demonstrated stronger fine motor skills, oral communication, letter and number recognition, cognitive classification, socio-emotional behaviour, independence, and classroom participation. In contrast, children without preschool exposure showed lower readiness, particularly in following instructions, recognising print symbols, counting, sustaining attention, and completing tasks independently. This pattern confirms that school readiness is holistic rather than purely academic, combining language, literacy, numeracy, self-regulation, socio-emotional competence, and learning behaviour (Blair & Raver, 2015; Snow, 2006; Slot et al., 2020).

The stronger performance in language, literacy, and numeracy is consistent with research showing that early language competence, print awareness, phonological awareness, number sense, and early mathematical reasoning predict later reading and mathematics achievement (Dickinson, 2011; Duncan et al., 2007; Snow, 2006). Similarly, gains in socio-emotional development and approaches to learning reflect the importance of self-regulation, cooperation, attention, and persistence for successful school adjustment (Blair & Raver, 2015; Raver, 2002).

Overall, the findings indicate that organised ECCE builds children's developmental preparedness and reduces early learning gaps before entry into Grade I, supporting both human capital arguments for early investment and Indian policy priorities under NEP 2020 and NCF-FS 2022 (Heckman, 2006; Ministry of Education, 2020; NCERT, 2022).

Discussion

The results are theoretically and empirically consistent. Bronfenbrenner's ecological perspective explains preschool as a key microsystem shaping early development (Bronfenbrenner, 1979), while Piaget and Vygotsky highlight the roles of play, exploration, guided interaction, and language-rich learning in cognitive and socio-cultural development (Piaget, 1952; Vygotsky, 1978). Empirical reviews and meta-analyses confirm that high-quality preschool and school-readiness interventions improve children's cognitive, language, literacy, numeracy, socio-emotional, and behavioural outcomes (Barnett, 2011; Çoban et al., 2023; Joo et al., 2019; Yoshikawa et al., 2013). The present findings therefore reinforce the need for quality ECCE as a preventive strategy for reducing foundational learning gaps and later risk of school dropout.

Educational Implications

The findings imply that Grade I readiness should be treated as a developmental outcome of quality ECCE, home support, and school transition practices. Since children with preschool exposure scored higher across all domains, priority should be given to expanding access, screening readiness at school entry, strengthening teacher capacity, supporting home literacy, and ensuring continuity between preschool and primary school (Duncan et al., 2007; Janus & Offord, 2007; Snow, 2006).

Suggested Policy Recommendations

Based on the ECE-SRA findings and strong evidence that quality ECCE improves readiness, learning, and long-term outcomes, the following recommendations are proposed (Barnett, 2011; Heckman, 2006; UNESCO & UNICEF, 2024; Yoshikawa et al., 2013):

1. Expand quality ECCE in underserved rural and tribal areas through stronger Anganwadi Centres, Balvatikas, and community preschools, as preschool participation significantly improved readiness in all seven domains.
2. Introduce Grade I school-readiness screening using the ECE-SRA to identify children needing early support in language, literacy, numeracy, socio-emotional, and learning-behaviour domains.
3. Strengthen ECCE–primary school alignment under NEP 2020 and NCF-FS 2022 to ensure continuity in play-based learning, foundational literacy and numeracy, and holistic development.
4. Provide regular teacher training in play-based pedagogy, language-rich instruction, early numeracy, developmental assessment, and classroom-based intervention.

5. Develop culturally and linguistically responsive preschool materials in English, A'chik, Khasi, and other local languages to strengthen classroom participation and early language development.
6. Strengthen parent engagement through storytelling, shared reading, songs, educational play, and home-based language activities.
7. Establish district-level monitoring to track readiness, identify low-performing children early, and provide timely remedial support during the foundational stage.

Conclusion

The study concludes that the Early Childhood Education Exposure and School Readiness Assessment (ECE-SRA) is a reliable, context-responsive tool for examining the link between early childhood education, school readiness, and primary school dropout risk in West Garo Hills, Meghalaya. With strong internal consistency (Cronbach's Alpha = 0.89), the tool offers a holistic measure of readiness across seven developmental domains. The findings show that children with organised ECCE exposure had significantly higher readiness, including stronger academic preparedness, communication, persistence, cooperation, and self-regulated learning. These competencies support Grade I adjustment and may reduce early learning gaps associated with repetition, disengagement, irregular attendance, and dropout. Thus, strengthening quality ECCE through play-based pedagogy, language-rich learning, culturally responsive materials, teacher preparation, parental engagement, and readiness monitoring is an evidence-based strategy for improving school readiness and reducing dropout risk. Future research should test the ECE-SRA with larger and more diverse samples and examine how readiness scores predict attendance, achievement, grade progression, and dropout over time.

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