# ABSTRACT

The early years of a child's life are crucial for holistic development, laying the foundation for physical, cognitive, emotional, and social growth. Between ages 3 and 8, children acquire essential skills that influence their academic success and lifelong learning. Recognising this, Early Childhood Care and Education (ECCE) has gained global and national focus. In India, the National Education Policy (NEP) 2020 prioritises universal access to quality ECCE and foundational literacy and numeracy. Despite this, significant gaps remain in ECCE delivery, with issues of quality, access, and equity hindering children's development. The major challenge is the lack of developmentally appropriate, culturally responsive pedagogical framework to support Emergent Literacy and Numeracy, essential skills of school readiness. These gaps underscore the urgent need for context-specific, evidence-based interventions to translate policy into effective classroom practice.

Furthermore, the systematic review conducted in the initial stage using the PRISMA model substantiates the critical and persistent challenges in India's ECCE system, underscoring a significant disconnect between ECCE policy intentions and on-ground implementation. The findings of the systematic review not only identified the systemic barriers but also pointed towards actionable reforms in terms of DAP's five key dimensions as outlined by the National Association for the Education of Young Children (NAEYC). Henceforth, with a realisation that adopting DAP is not just a pedagogical choice, but a strategic imperative to achieve equitable, inclusive, and high-quality early education in India.

In response to this need, the present study was undertaken with the primary objective of developing a DAP-based curriculum framework focused on Emergent Literacy and Numeracy Skills of preschoolers. Secondary objectives included assessing skill acquisition under the existing pedagogical framework, examining the impact of socio-demographic factors on these skills, and implementing and evaluating the effectiveness of the DAP-based curriculum in enhancing these foundational skills.

The study was conducted in two sequential phases. Phase I employed a cross-sectional research design to establish a baseline understanding of the Emergent Literacy and Numeracy Skills of preschool children. A sample of 281 children, aged 3 to 6 years, was drawn from five private ECCE centres in Coimbatore District, of Tamil Nadu. An

“Emergent Literacy and Numeracy Assessment Pack”, a modified version of the North Carolina Kindergarten Common Core Standards (2017), was used as the assessment tool, which was tailored to suit the Indian context. The assessment tool included 22 items divided between Emergent Literacy and Numeracy Skills. The Emergent Literacy comprised 13 items, with a focus on Reading Skills such as Phonological awareness, Print awareness, and Listening comprehension. Writing Skills involving Alphabet and Number writing. Emergent Numeracy Skills contained 9 items, covering key areas such as Number and operation, Data analysis, measurement, Algebra and pattern making, Geometry and spatial awareness. Moreover, socio-demographic markers - such as age, gender, birth order, parental educational and occupational status - were collected to identify patterns or disparities in skill acquisition across different backgrounds. Percentage analysis and ANOVA were carried out in the subsequent phase.

Phase II of the study adopted a "Before and After with Waitlist Control Group" design. A total of 62 children, aged 4–5 years, from four of the preschools of phase I were selected and equally divided into an experimental group and a control group. A Developmentally Appropriate Practice (DAP)-based curriculum framework focused on Emergent Literacy and Numeracy Skills was developed, drawing on the HighScope and Head Start curricula, with significant adaptations to suit the specific needs and contextual realities of Indian preschools. The curriculum was implemented over a period of 70 working days by the educators who were trained for 7 days. A pre and post-assessment test was conducted using the same adapted tool from Phase I, and results were analysed using ANCOVA statistics.

Key findings of Phase I revealing the existing levels of Emergent Literacy and Numeracy Skills demonstrated that the educators' practices were particularly effective in fostering Listening comprehension and Number writing skills. While some children aged 3 to 4 and 4 to 5 were in the gaining stage in Print awareness, mastery level in Phonological awareness, and Alphabet writing, and just approaching level in all indicators of Numeracy Skills. Over a quarter of 5–6-year-olds remained at lower performance levels across these areas. These findings further confirm the need for a suitable pedagogical framework grounded in DAP. Further, significant associations were identified between various socio- demographic factors and these foundational skills. Birth order influenced Listening comprehension and Number operation skills of the preschoolers, with first-borns performing better. Writing skills and Number and operation were linked to the type of

ECCE centres. Fathers' education was significantly related to Number writing, Geometry and spatial awareness, and Algebra and pattern-making, while mothers' education influenced Listening comprehension, Phonological awareness, and Algebra and pattern-making. Fathers' occupation was associated with Print awareness, and mothers' occupation impacted Listening comprehension, Geometry and spatial awareness, and Algebra and pattern-making Skills.

The key findings of Phase II revealed that except for Listening comprehension, all other indicators of Emergent Literacy and Numeracy showed significant positive effects following the DAP-based intervention, with moderate to high effect sizes demonstrating the curriculum's effectiveness. Phonological awareness had a large effect size of 78%, reflecting the success of rhyming and phoneme manipulation activities. Print awareness improved moderately by 25%, showing increased engagement with print. Writing skills saw notable gains, with Alphabet writing improving by 27% and Number writing by 54%, highlighting the impact of structured, age-appropriate, play-based activities. Numeracy skills also improved significantly across domains: Number and operations (43%), Data analysis and measurement (64%), Algebra and pattern-making (41%), and Geometry and spatial awareness (54%).

Thus, the developed DAP-based curriculum framework holds strong potential to bridge existing gaps and significantly enhance preschoolers' Emergent Literacy and Numeracy Skills. Additionally, aligning ECCE efforts with the Sustainable Development Goals (SDGs) - particularly SDG 4 (Quality Education) - ensures that such initiatives contribute to inclusive and equitable quality education for all children, promoting lifelong learning opportunities and supporting broader social and economic development.

**Key words :** ECCE, NEP, Preschoolers, DAP, NAEYC, Emergent Literacy and Numeracy Skills, Emergent Literacy and Numeracy Assessment Pack, Preschoolers, ANCOVA