

## **II. REVIEW OF LITERATURE**

The review of related literature for the study titled “**Effectiveness of Developmentally Appropriate Practice-based Curriculum Framework on Emergent Literacy and Numeracy Skills of Preschoolers**” has been organised under the following thematic headings:

- A. Current Landscape of Early Childhood Care and Education (ECCE) in India**
- B. Key Concerns, Gaps, and Challenges in ECCE in India: A Review Using the PRISMA Model**
- C. Developmentally Appropriate Practice (DAP): Concepts, Core Considerations, Principles, and Theoretical Foundations**
- D. Developmentally Appropriate Practice (DAP) as a Strategic Framework to Address the Limitations of Preschool Education in India**
- E. Emergent Literacy and Numeracy Skills in Preschoolers: Significance and Theoretical Underpinnings and**
- F. Conceptual Framework Guiding the Present Study**

### **A. CURRENT LANDSCAPE OF EARLY CHILDHOOD CARE AND EDUCATION (ECCE) IN INDIA**

Early childhood is a crucial stage in a child's life (Manhas, 2020). The first six to eight years of a child's life are widely considered the most important for lifelong development. During this period, rapid growth lays the foundation for cognitive, emotional, social, and physical development (UNESCO, 2022). During this period, children form essential neural connections that shape their capacity to learn, socialise, and adapt to the world around them. In response to the significance of these early years, education, which begins at birth, has emerged as a vital framework to ensure that children receive appropriate care, stimulation, and learning opportunities. Early Childhood Care and Education (ECCE) supports children's holistic development and lays the foundation for academic success and lifelong well-being (UNICEF, 2021).

ECCE is generally defined as the care and education of children from birth to six years previously, and now it has been extended to eight years globally. The foundation of all

learning is laid during these years. Getting the foundations right carries substantial future benefits, better education in school, and higher educational attainment, resulting in significant social and economic gains for society (Soy, 2022). Recognising the universal importance of these formative years, global organisations have developed policies and frameworks to support early childhood care and education across nations.

According to UNESCO, —ECCE is important because it capitalises on a period of rich brain development for children and, when it is of good quality, can help them achieve their full potential. It can lay the foundation for good health and nutrition, learning and educational success, social-emotional learning, and economic productivity throughout life (Kour, 2023). Neuroscience research shows that early brain development creates pathways that influence health, learning, and behaviour throughout life. Without a stimulating and supportive environment during these critical years, a child's brain may not develop to its full potential, sometimes with irreversible effects. (Prajapati & Rajkumar, 2018).

According to UNESCO (2016), children who engage in early and play-based learning activities have better developmental outcomes. Good quality learning during the early childhood period helps to reduce the chances of dropout and repetition and improve outcomes at all levels of education. Children enrolled in at least one year of pre-primary education are more likely to develop the critical skills they need to succeed in school and less likely to repeat grades or drop out (Bajpai, 2022). In addition, UNICEF has also stated that ECCE can contribute to child development in many ways: by improving school enrolment and retention rates and reducing school dropout, by narrowing the gap between children from different socioeconomic classes and, thus, ‘levelling the playing field’. Hence, it is well understood that ECCE gives children a solid foundation upon which all learning depends, making every education stage more efficient and productive.

The Organisation for Economic Co-operation and Development (OECD, 2020) has affirmed that quality ECCE programs are particularly effective in reducing disparities caused by socio-economic disadvantage and promoting equitable access to education from the earliest stages. As such, ECCE is increasingly seen as a strategic investment in both individual potential and national development. In 2021, ECCE was acknowledged as a pivotal element of educational and developmental policies globally. Moreover, the Sustainable Development Goals (SDGs), particularly Goal 4.2, aim to ensure that all children have access to quality early childhood development, care, and pre-primary

education by 2030. Countries like Finland, Sweden, and Norway have set benchmarks in ECCE through universal access, well-trained educators, and innovative play-based curricula. These countries treat ECCE as a public good, investing heavily to ensure high-quality and equitable access to services.

While countries such as Finland and Norway have institutionalised robust ECCE systems, India has also made significant strides in aligning early childhood education with global standards through a series of national policies and programmes. Accordingly, the NEP 2020 recognises ECCE as the foundation for all future learning and emphasises the need for quality care, education, and health services. The policy also detailed its aim to provide "play-based, activity-based, and inquiry-based" learning, ensuring that children receive age-appropriate education during their formative years. The policy also advocates for the inclusion of children aged 3-6 years in the formal education system (Ministry of Education, Government of India, 2020).

However, India has taken significant strides to promote ECCE through the implementation of various national policies and programmes. The major initiative specific to the early years was the National Policy for Children (1974), a comprehensive policy that recognised children as a national asset and laid the groundwork for child-centric planning in India. A major outcome of this policy was the launch of the Integrated Child Development Services (ICDS) scheme in 1975. Initially implemented on a pilot basis, ICDS aimed at delivering a holistic package of services including nutrition, health, and early childhood education to children under six years and pregnant and lactating mothers. Following this, the National Policy on Education (1986) emphasised ECCE as a vital input for human development, while the National Nutrition Policy (1993) targeted nutritional well-being during early childhood. The 12th Five-Year Plan broadened the focus beyond ICDS, advocating systemic reforms across public, private, and voluntary sectors.

The Government of India approved the National Early Childhood Care and Education (ECCE) Policy in 2013. The Policy framework also includes the National ECCE Curriculum Framework and Quality Standards for ECCE. The Policy aims to provide quality early childhood education to all children under six. The vision of the policy is to achieve holistic development and active learning capacity of all children below six years of age by promoting free, universal, inclusive, equitable, joyful, and contextualised opportunities for laying the foundation and attaining full potential. The policy focuses on

equity, inclusion, quality improvement, capacity building, research, and public awareness. The policy recognises that young children are best cared for in their family environment, and thus, strengthening family capabilities to care for and protect the child will receive the highest priority.

The India New-born Action Plan (2014) further reinforced the health aspect of ECCE by addressing neonatal care and survival. Below is an overview of two ECCE initiatives as portrayed by the Ministry of Women and Child Development Report (MWCD), 2020. The Poshan Abhiyaan, launched in 2018, primarily addresses the nutritional needs of children, pregnant women, and lactating mothers. Although nutrition is its main focus, the programme also supports early childhood development through community involvement and training initiatives (NITI Aayog, 2020). The Samagra Shiksha Abhiyan (SSA), launched in 2018, is a comprehensive effort to improve educational quality, including ECCE, in India. The programmes aimed to address issues such as disparities in access to quality education and inadequate teacher training. SSA also supports the development of ECCE materials and teacher resources for pre-school education in rural areas (MWCD, 2018). Additionally, UNICEF, India, by partnering with the Ministry of Women and Child Development, focus on strengthening the Early Childhood Education (ECE) component under the ICDS program. UNICEF has played a key role in building capacity for ECCE teachers and implementing community-based education programs aimed at marginalised populations (UNICEF India, 2017). These earlier initiatives laid the groundwork for the transformative shift introduced by the National Education Policy (NEP) 2020, which redefines the structure and delivery of ECCE in India (Vajiram & Ravi, 2025).

Additionally, the Balvatika program introduced under the NEP, 2020, is a recent development aimed at standardising ECCE across government and private schools. Balvatika focuses on play-based and activity-driven learning to foster foundational literacy and numeracy skills, ensuring a smooth transition from preschool to primary education.

Consequently, World Bank (2021), in its report, has stated that, in India, ECCE has gained significant momentum over the past few decades, especially with the growing body of evidence linking quality early childhood programmes with improved school readiness, reduced learning gaps, and enhanced long-term educational outcomes. They also affirmed

that despite India making considerable progress, the country still faces challenges in aligning with the global standards.

The UNESCO Global Education Monitoring Report (2021) highlighted India's efforts to expand access through initiatives like ICDS and Anganwadi centres, which reach over 70 million children annually. However, gaps in quality, infrastructure, and educator training persist, with only 22% of Anganwadi workers receiving formal ECCE training. Bridging these gaps will require sustained investment, capacity building, and the integration of innovative pedagogical practices that resonate with India's diverse socio-cultural context.

Amidst the realisation that ECCE encompasses a broad range of activities that support the development of children in their early years, and these activities need to be centred around physical well-being, cognitive skills, emotional growth, and socialisation, ECCE often swings between two extremes: focusing only on physical health or solely on academics. The fact that ECCE should include holistic development, play-based learning, inclusion and equity, and the presence of quality educators is not given due importance. A balanced approach that supports children's physical, emotional, social, and intellectual growth has not received enough emphasis (Kaul & Sankar, 2019).

Even though India has made considerable strides in advancing ECCE through various initiatives, significant gaps persist in its effectiveness and implementation. The government has introduced numerous programmes over the years to address the developmental needs of young children and promote equitable access to quality early education. These programmes have improved access to nutrition, healthcare, and learning. However, concerns remain about the quality and reach of early education.

In India, ECCE is provided by both public and private sectors through multiple models (Rao et al., 2021). In addition, non-profit organisations do exist in a different type of setting to serve the growing need for early childhood education in the country. Irrespective of the type of sectors that provide ECCE services, every centre has its strengths and weaknesses as enumerated below:

A major initiative of the Public Sector, the Integrated Child Development Services (ICDS), though it had expanded to establish 1,363,000 AWCs operating in the country in 2018 (GOI, 2018d), it has its challenges. An evaluation of the functioning of AWCs was

undertaken by the government (Niti Aayog) in 2015 (GOI, 2015). Results indicated that 68.6% of AWCs were providing interventions to handle child malnutrition. However, 22.5% of AWCs did not have the required medication to treat children who were ill. Observations revealed that only 59% of the AWCs had adequate space, and thus, the remaining 41% had either inadequate or unsuitable accommodation. Through the years, the AWCs have also been faulted for not giving enough attention to preschool education (Rao & Kaul, 2018). The ICDS scheme aims to provide a comprehensive package of health, nutrition, and preschool education services through Anganwadi centres. Although the scheme has a wide reach, preschool education remains weak. This is due to poor infrastructure, limited teacher training, and a focus on health over education (Bhattacharja & Ramanujan, 2017; Kaul, 2019; UNICEF, 2017). The National ECCE Policy of 2013 sought to address quality and access issues by providing curriculum standards and a rights-based framework. However, it has faced poor dissemination, inadequate funding, and a lack of enforcement mechanisms (UNESCO, 2014; UNICEF, 2017).

Additionally, the Samagra Shiksha programme, designed to integrate education from pre-primary to secondary levels, has not allocated sufficient resources specifically for ECCE. The lack of coordination between the Ministry of Education and the Ministry of Women and Child Development further weakens the convergence required for effective ECCE delivery. However, the implementation of ECCE under Samagra Shiksha has faced challenges such as inadequate infrastructure in government schools for pre-primary classrooms, insufficiently trained preschool teachers, and a lack of convergence with existing schemes like ICDS (Kaul et al., 2020; World Bank, 2021). Additionally, disparities in state-level capacities to utilise funds and manage integrated ECCE models have resulted in uneven outcomes (UNICEF, 2019). Samagra Shiksha has a strong framework, but its success depends on improving infrastructure, teacher training, and coordination with ECCE providers.

Government primary schools also have age-segregated LKG and UKG classes. Official data are limited because the MWCD tracks children only up to age six and does not cover enrolment in primary schools. Meanwhile, the Ministry of Human Resource Development starts tracking enrolment only from Grade 1. Hence, children below 6 years in primary schools are not enumerated in the surveys of educational institutions. However,

household surveys do provide information on the enrolment of children in different services. Studies have indicated that preschool-aged children are overage or underage for the class in which they are enrolled (Alcott et al., 2018; Kaul et al., 2017).

Creche services are also provided both through public schemes and statutory provisions. The Rajiv Gandhi National Creche Scheme for working mothers offers care and education services for children below 6 years of age. Statutory crèches are mandated under laws such as the Mines Act, Factories Act, and the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). However, they often face problems like low enrolment, poor infrastructure, and a lack of trained staff.

The private ECCE sector includes stand-alone, self-owned, and franchise preschools. These schools are expanding steadily, even into rural areas. The quality of services provided by them varies, which needs to be regulated. Data from a nationally representative sample, collected in 2013–2014, indicate that about 31% of 3 to 6-year-olds receive preschool education from private, for-profit centres. Private preschools are not regulated, and while they have expanded rapidly in cities, low-fee preschools are also spreading into rural and tribal regions. Private preschools vary greatly—from basic one-room setups to well-equipped centres with trained staff (Singh & Mukherjee, 2017). The pre-school in India is forecasted to grow at a Compound Annual Growth Rate (CAGR) of around 23% during 2017-22 (Kaushal, 2018).

Non-governmental organisations also play a crucial role in providing ECCE to children from disadvantaged backgrounds, utilising local resources. Two long-established, respected NGOs providing ECCE are Mobile Crèches and Pratham. The Mobile Crèches organisation has focused on the provision of ECCE at construction sites to young children of construction workers. These children have typically accompanied their parents, who have migrated to cities from rural areas (Bajaj & Sharma, 2016). Pratham's Early Childhood Education programs focus on promoting the holistic development of children ranging in age from 3 to 6 years. This is done through the provision of direct services or through supporting Anganwadis or preschool classes in government primary schools. In 2017–18, about 610,000 children benefited from Pratham's ECE programs. About 15,000 received direct services, and about 68,000 benefited from Pratham's Anganwadi Support program, while another 527,000 children were reached through Pratham's partnership with state governments.

The ECCE services are also being provided by voluntary organisations, often run by trusts, societies, and religious groups, and supported by government and international funding agencies. Their outreach and the nature of services vary, necessitating regulatory oversight to ensure alignment with state norms and quality standards (NIOS, 2019). According to the NEP 2020, only 17% of children in the 3–6 age group are enrolled in a formal preschool education system, highlighting significant gaps in access, particularly in rural and underserved areas. Kaul (2020) emphasises that the NEP represents a transformative shift through initiatives like Balvatikas, which aim to bridge the gap between preschool and primary education using inclusive, culturally relevant approaches. Murthy (2022) adds that while the NEP’s vision is progressive, its success depends on addressing ground-level challenges such as teacher training, infrastructure, and resource allocation. The proposed National Curricular and Pedagogical Framework for ECCE is a key step toward making programs more inclusive, equitable, and responsive to India’s diverse needs.

In conclusion, while India has made commendable strides in expanding access to Early Childhood Care and Education through a combination of public initiatives, private efforts, and non-governmental support, the system remains fragmented and uneven in quality. The NEP 2020 marks a significant policy shift by recognising ECCE as foundational to lifelong learning and development, yet its successful implementation hinges on addressing persistent gaps in infrastructure, training, funding, and inter-ministerial coordination. As India strives to align its ECCE framework with global standards, it must ensure that equity, inclusion, and holistic development are at the core of every intervention. Moving forward, a strong emphasis on quality, regulation, and contextual relevance will be vital in realising the full potential of ECCE as a transformative force for both individual and national growth.

## **B. KEY CONCERNS, GAPS, AND CHALLENGES IN ECCE IN INDIA: A REVIEW USING THE PRISMA MODEL**

According to Dasgupta (2019), around 260 million children are studying in more than 1.5 million schools across India at present. From these, over 70% of children were found to not possess basic foundational skills, such as Literacy and Numeracy. Data also shows that each year, an estimated 6 million children complete 8 years of compulsory schooling in India with alarmingly low learning levels. Such worrying trends in the formative years of

schooling can greatly destabilise a nation, and the investigator aimed to explore the reasons for such lower learning levels. Extensive research evidence indicates that most of the ECCE centres in India are lacking in age and developmentally-appropriate equipment and play materials. Moreover, there was a predominance of formal teaching of the 3R's - Reading, Writing, and Arithmetic, and rote memorisation (Chandra et al, 2017; Jairam and Chopra, 2019; Kaul et al, 2014).

With these depictions of the ECCE scenario in India, the investigator wanted to determine the obstacles that obstruct the quality reforms in ECCE, as well as suggest potential remedies. Hence, the investigator initiated the literature collation to answer the question: What are the shortcomings of ECCE in India? Accordingly, this section of the literature review will focus on identifying the challenges and concerns faced by the ECCE services of India.

In brief, the general review collated had vividly portrayed that despite the significance and the government's efforts to strengthen ECCE programmes in India, the systems face numerous challenges that undermine their effectiveness. The key shortcomings with the consideration of various articles about the ECCE functioning in India had pointed out certain major shortcomings/ challenges/ concerns, and they were as follows.

- Inconsistent curriculum framework
- Poor teacher training
- Inadequate learning materials
- Quality concerns in public Anganwadis
- Developmentally inappropriate practices in preschools
- Overemphasis on formal teaching methods
- Lack of supervision and standardisation
- Insufficient infrastructure and facilities
- Low funding and resource allocation
- Gap between policy and implementation

(Agarwal & Chanda, 2022; Balaji & Pyari, 2023; Gosh, 2019; Guduru, 2024; Government of India, 2016; Halder, 2019; Malik & Behera, 2024; Rao et al., 2021)

To systematically identify and evaluate the challenges within India's ECCE system, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) model was employed. This methodological approach allowed for a transparent, structured, and replicable process of literature selection, screening, and synthesis.

**Step 1: Identification of Records:** A targeted literature search was conducted using multiple databases—Google Scholar, PubMed, SCOPUS, Web of Science, Shodhganga, and EBSCO. The search terms included: “*ECCE centres in India*,” “*importance of early childhood education in India*,” “*problems and prospects of ECCE in India*,” “*issues and challenges of ECCE in India*,” and “*shortcomings of ECCE in India*.”

Inclusion criteria were as follows:

- Focus on ECCE services for children aged 3–6 years in India
- Emphasis on systemic challenges, implementation gaps, or educational practices
- Studies published in English after 2015 and
- Clearly defined research questions and robust methodologies.

Despite extensive online searches, limited literature specifically addressing the Indian context was found. Therefore, manual searches were conducted at university libraries to access non-digitised books, reports, and journals. This step significantly enriched the data pool with relevant empirical and grey literature.

A total of 60 studies were initially collected. After an initial review to remove duplicates and ineligible items, 50 studies were retained for the second screening stage.

**Step 2: Screening and Eligibility Check:** A more detailed review of the 50 selected studies was undertaken to assess alignment with the refined inclusion criteria:

- Address at least one specific challenge, gap, or issue in ECCE in India
- Provide insights into core operational areas: curriculum, pedagogy, assessment, infrastructure, or stakeholder involvement, and
- Include at least one evidence-based recommendation.

During this rigorous screening, 30 studies were excluded for not meeting one or more criteria, resulting in a final set of 20 high-quality studies for analysis.

**Step 3: Inclusion and Thematic Synthesis:** The final 20 studies were analysed to extract and categorise key findings. The analysis was conducted in two stages:

**a. Thematic Classification:** Identified challenges were grouped into five dimensions:

- ✓ Curriculum
- ✓ Classroom Environment
- ✓ Teaching and Learning Process
- ✓ Assessment
- ✓ Community Involvement

**b. Recommendation Mapping:** Each shortcoming was matched with relevant recommendations from the same or related studies to explore potential policy or practice-oriented solutions.

This process provided a coherent synthesis of the systemic gaps in ECCE implementation and illuminated the persistent disconnect between policy frameworks and ground-level realities. Accordingly, the literature collated through the PRISMA model from the chosen 20 studies was consolidated and portrayed in Table I.

**TABLE I**  
**IDENTIFIED SHORTCOMINGS IN ECCE IN INDIA MAPPED TO RECOMMENDED INTERVENTIONS**

<b>Dimension</b>	<b>Shortcomings Identified</b>	<b>Recommendations</b>
<b>Curriculum</b>	<ul style="list-style-type: none"> <li>✓ Lack of developmentally appropriate curriculum (Chandra et al., 2017)</li> <li>✓ Absence of standardised curricular framework (Halder, 2019; Saikia &amp; Roy, 2020)</li> <li>✓ Misalignment among standards and content (Vashisth et al., 2021)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Develop a common, contextualised, developmentally appropriate (DAP) curriculum (Chandra et al., 2017)</li> <li>✓ Appoint qualified ECCE teachers with proper curriculum training</li> <li>✓ Establish a national ECCE council for regulation</li> </ul>
<b>Classroom Environment</b>	<ul style="list-style-type: none"> <li>✓ No specific legal provisions for training and regulation (Teotia, 2021;)</li> <li>✓ High teacher-child ratio and overcrowding (Chandra et al., 2017; Vashisth et al., 2021)</li> <li>✓ Poor classroom management (Rao et al., 2021)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Mandate DAP-based curriculum and monitor ECCE activities</li> <li>✓ Implement intensive training with regular orientation for ECCE staff</li> <li>✓ Establish uniform DAP frameworks nationwide</li> </ul>
<b>Teaching and Learning</b>	<ul style="list-style-type: none"> <li>✓ Dominance of rote learning and 3Rs (Kaul, 2019)</li> <li>✓ Lack of teaching-learning materials (Ghosh &amp; Dey, 2020; Singh &amp; Mukherjee, 2017)</li> <li>✓ Underpaid and untrained staff (Arya, 2018; Mir et al., 2023., Sawhney, 2020)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Make DAP-based curriculum mandatory</li> <li>✓ Improve infrastructure and material resources</li> <li>✓ Enhance teacher salaries and professional development opportunities</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>✓ No structured monitoring and evaluation (Rao et al., 2021)</li> <li>✓ Informal and irregular developmental assessments (Chandra et al., 2017)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Develop national assessment frameworks aligned with DAP</li> <li>✓ Ensure curriculum standards are adaptable to diverse regional contexts</li> </ul>
<b>Community Involvement</b>	<ul style="list-style-type: none"> <li>✓ Weak parent-teacher communication (Chandra et al., 2017)</li> <li>✓ Low awareness and engagement among parents in both rural and urban areas (Akshaya &amp; Vikraman, 2023)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Launch awareness campaigns in collaboration with NCERT and UNICEF</li> <li>✓ Promote active parent and community involvement through inclusive school programmes</li> </ul>

*Note.* This table synthesises findings from 20 systematically reviewed studies focused on ECCE in India. Recommendations are drawn directly from or inferred based on the reviewed literature.

To conclude, the systematic review conducted using the PRISMA model highlights critical and persistent challenges in India's ECCE system. Despite policy-level emphasis and expanding coverage, issues such as inconsistent curricula, inadequate teacher training, poor infrastructure, overreliance on rote-based methods, and weak community involvement continue to hinder quality outcomes. The findings underscore a significant disconnect between ECCE policy intentions and on-ground implementation. By mapping these shortcomings to contextually relevant recommendations, this review not only identifies the systemic barriers but also points towards actionable reforms. Strengthening ECCE in India requires a multi-pronged approach, rooted in developmentally appropriate practices, sustained investment, and active stakeholder engagement, to ensure holistic and equitable early learning for all children.

### **C. DEVELOPMENTALLY APPROPRIATE PRACTICE (DAP) - CONCEPT, CORE CONSIDERATIONS, PRINCIPLES, AND THEORETICAL FOUNDATIONS**

Developmentally Appropriate Practice was introduced in the United States in the late 1980s through Bredekamp's (1987) seminal work, —Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth through Age 8. Gestwicki (2011) added that DAP acknowledges the role of play as a vehicle for the holistic development of learners, as it intrinsically motivates them to create their world and self-identity. Brown et al. (2015) stated that DAP consists of domains or developmental skills that can be developed by providing hands-on learning activities, real-world experiences, and varied learning opportunities for young learners. According to Demircan & Erden (2015), DAP refers to a practice focused on knowledge regarding the learning and development of children. Early education that suits development is recognised in natural social studies, cultural values, and in multiple languages, including the understanding of the needs for children to interact with their surroundings with minimum adult intervention according to their developmental stage. The —appropriatel concept in DAP was mentioned in various dimensions for professionalism development, such as appropriateness for age, self, social, and culture of children.

The National Association for the Education of Young Children (2022) has stated that DAP is a widely recognised approach in early childhood education, focused on ensuring that teaching methods and learning environments support optimal growth and development for young children. DAP is a framework grounded in child development research,

advocating for educational practices that align with children's developmental stages, individual needs, and cultural contexts. DAP is a teaching framework based on research that outlines principles and guidelines about child development and learning that continuously improve and develop each child's potential to the fullest (McKoy, 2022; NAEYC, 2020).

According to the National Association for the Education of Young Children (NAEYC, 2020), a child's development occurs based on their nature, where a child's prior knowledge and acquired experiences can be furthered or expanded when given a chance to think, explore, and build from those already acquired. NAEYC recognises that early childhood teachers are the ones in the grassroots who make decisions about teaching and early learning experiences of young children, and they are the people who have to keep in mind those identified goals for children's learning and development, and plan intentional learning experiences to help them achieve those learning outcomes.

According to the NAEYC (2020), Developmentally Appropriate Practice is guided by three core considerations that inform educators' decisions to support optimal learning and development for each child:

1. *Commonality in Children's Development and Learning*: This refers to the universal patterns of child growth and development. Educators use knowledge from developmental research to understand what is typical for children at different ages and stages. This helps in designing learning experiences that align with general developmental expectations.
2. *Individuality*: Every child is unique, with distinct temperaments, interests, abilities, backgrounds, and learning styles. Educators must consider each child's strengths and needs to provide meaningful, tailored learning experiences that respect individual differences.
3. *Context*: A child's family, culture, community, and life experiences greatly influence development and learning. Educators must understand and honour the cultural and social contexts in which children live to ensure learning environments are inclusive and relevant.

These three considerations are interdependent and must be thoughtfully balanced in planning and implementing early childhood education practices. They help ensure that

learning experiences are age-appropriate, individually appropriate, and culturally appropriate.

Weaving the strands of age appropriateness, individual appropriateness and socio-cultural appropriateness into a cohesive philosophy requires deliberate effort and continuous reflection by recognising children's developmental skills from learning to cut with scissors or holding a pencil, to learning to share, taking turns and problem solving which are developmental skills for pre-primary school children (Sanders & Fargo, 2018).

Furthermore, NAEYC in the 1990s had also provided nine key principles that inform Developmentally Appropriate Practice (DAP). These principles were articulated and further refined in subsequent editions of the DAP Position Statement and the book *Developmentally Appropriate Practice in Early Childhood Programs*, particularly in the 2009 and 2020 editions. These principles are as follows:

Principle 1. Development and learning are dynamic processes influenced by the interaction between a child's biological characteristics and their environment

Principle 2. All domains of development—cognitive, physical, social, and emotional—are interrelated, and learning in one area can influence progress in another

Principle 3. Children develop at varying rates, and while there are optimal periods for certain types of learning, development remains a continuous and individualised process

Principle 4. Early experiences play a crucial role in shaping a child's learning trajectory, and secure, responsive relationships with caregivers and peers provide the foundation for healthy development

Principle 5. Development progresses toward greater complexity, self-regulation, and representational abilities as children grow

Principle 6. Children's learning is deeply embedded within their social and cultural contexts, reinforcing the need for educators to design experiences that are meaningful, inclusive, and developmentally appropriate

Principle 7. Children learn in an integrated fashion that cuts across academic disciplines or subject areas. Because the foundations of subject area knowledge are

established in early childhood, educators need subject-area knowledge, an understanding of the learning progressions within each subject area, and pedagogical knowledge about teaching each subject area's content effectively

Principle 8. Development and learning advance when children are challenged to achieve at a level just beyond their current mastery and when they have many opportunities to reflect on and practice newly acquired skills, and

Principle 9. Used responsibly and intentionally, technology and interactive media can be valuable tools for supporting children's development and learning.

By integrating these core considerations and principles, educators create supportive, engaging, and effective learning environments that foster children's holistic growth and lifelong learning.

The dimensions for Developmentally Appropriate Practice in action were also defined by NAEYC in 2009. These dimensions are formulated in such a way that, using knowledge of child development and learning in context as a decision-making framework, the early childhood learning institutions and teachers could use to provide pre-K and kindergarten students with quality learning environments. The five dimensions are

- ✓ Creating a caring community
- ✓ Engaging in partnerships with families and community connections
- ✓ Observing, recording, and evaluating students' development and learning
- ✓ Teaching to increase each student's development and learning
- ✓ Applying a curriculum that is engaging to achieve goals and

However, in the 2020 edition of the DAP Position Statement, NAEYC added one more dimension, —Displaying professionalism as an early childhood teacher. However, the current research followed the dimensions as proposed by NAEYC in 2009.

According to Sanders and Farago (2018), in a DAP-classroom, social activity, cultural sensitivity, and teacher engagement with learning are valued practices. In terms of social activity, DAP classrooms are contexts in which children have ample opportunity to work and play collaboratively with each other. Teachers are encouraged to structure the environment to allow for small and large groupings that —children informally create or the teacher organises. According to the recommendations regarding appropriate practice, —as

each child encounters what others in the group think, say, and create, the child's knowledge and understanding grow and change. During these social activities, teachers engage with children to extend their learning or, from a sociocultural perspective, seek opportunities to capitalise on children's learning by working within a child's zone of proximal development. A range of strategies is employed for this, which include: modelling, asking questions, providing suggestions, adding complexity to a task, posing problems, coaching, and scaffolding. The intent behind these methods is to —enable a child to consolidate learning and to move to the next level of functioning.

The implementation of DAP is critical for fostering positive developmental outcomes in young children. It helps to cultivate essential skills such as social-emotional regulation, problem-solving, and self-confidence. By promoting active learning and providing opportunities for children to explore and engage with their environment, DAP creates an educational climate where children are empowered to be active participants in their own learning (Kostelnik et al., 2015). Furthermore, DAP's emphasis on play-based and experiential learning aligns with recent research that highlights the central role of play in promoting cognitive and social-emotional development (Bodrova & Leong, 2019).

Early childhood learning institutions and early childhood teachers can use the DAP theory to provide quality collaborative learner-centered instruction to pre-K and kindergarten students that supports the growth and developmental milestones of students' social, emotional, physical, and cognitive skills (Ford et al., 2020; NAEYC, 2020a). Early childhood teachers who implement DAP do provide quality learning experiences that intentionally enhance the growth and development of pre-K and kindergarten students (Taylor, 2020).

A study conducted by Rivero (2019), had observed that the major problems and issues associated with the implementation of DAP include the teachers' perceptions and observations on the wide, complex, and very comprehensive scope of the context of developmentally appropriate. Teachers are typically challenged by the multiplicity of developmentally-appropriate practices that they need to consider, meet, and integrate across diverse domains, aspects, and areas based on the learning needs and demands of their learners. These areas include pedagogical methods, educational resources, instructional activities, and other forms of academic services for the learners. Likewise, Farley et al. (2018) revealed that early childhood teachers did not know about DAP teaching strategies and noted that the teachers did not understand them.

## **Theoretical framework of DAP**

To fully understand the impact of DAP, it is essential to explore the theoretical frameworks that inform its practices. Several well-established theories of child development support DAP's core principles and are outlined below:

***Piagetian Constructivist Theory:*** Although several theories undergird DAP, the Piagetian constructivist theory is the most pervasive theoretical foundation. The conceptualisation of children's thinking according to Piagetian theory assumes that biological maturation must occur for children to process information about the world in a progressively sophisticated manner. From the Piagetian perspective, the maturation associated with thinking includes biological growth and direct, concrete experiences with the environment (Piaget 1960). When a child interacts with objects within the environment, dissonance between the direct experience and the former cognitive structures is created (Sanders & Farago, 2018)

For instance, Jean Piaget's theory of cognitive development is foundational, as it emphasises the stages of cognitive growth and the need for age-appropriate learning experiences that reflect children's developmental capacities (Lillard, 2017). According to Piaget, children actively construct knowledge through interactions with their environment, which is a central tenet of DAP's hands-on learning approach. DAP strongly relies on developmental psychological research and theory concerning childhood growth and development.

***Vygotsky's Sociocultural Theory:*** Vygotsky's sociocultural theory is a foundational framework for understanding how social interactions and cultural influences shape children's cognitive development (Hargraves, 2021; Vygotsky, 1978; Burkhardt et al., 2023). To comprehend the significance of socio-culturalism, it is crucial to understand the fundamental concepts central to sociocultural theory. These concepts illustrate how social interactions, cultural contexts, and historical factors shape individuals' cognitive processes, learning experiences, and development (Burkhardt et al., 2023; Hargraves, 2021; Sawyer, 2017; Vygotsky, 1978). Central to Vygotsky's sociocultural theory is Zone of Proximal Development (ZPD) (Bodrova & Leong, 2024; Irshad et al., 2021).

Learning experiences that are just beyond the child's acquired abilities are seen as critical for learning. In other words, the assistance provided by a more advanced peer or a teacher extends slightly beyond the child's current abilities. The child can develop skills

beyond the original level of functioning (Sanders & Farago, 2018). This theory significantly contributes to DAP by emphasising the crucial role of social interaction and cultural context in children's learning, suggesting that children learn best through collaborative activities with more knowledgeable peers and adults within their ZPD, which directly informs how educators should structure learning experiences to support individual needs and promote meaningful development across various domains (Zhou 2024). ZPD refers to the gap between learners' current level of ability or understanding and the level they can achieve with the guidance and support of more knowledgeable individuals, typically educators or peers. ZPD is significant in educational settings as it focuses on the potential for learning and development through social interaction and collaboration (Bodrova & Leong, 2024; Irshad et al., 2021; Vygotsky, 1978). Cultural tools, including language, symbols, and artefacts, mediate children's interactions with their social and cultural environments (Hogg, 2023; Prins et al., 2023; Rahmita et al., 2023). Furthermore, to facilitate learning and development, scaffolding provides temporary support to children within their ZPD (Loizou & Olymbiou, 2023).

Building upon the notion of ZPD, scaffolding involves providing structured support to learners as they engage in activities beyond their current level of competence (Loizou & Olymbiou, 2023). Scaffolding may include cues, prompts, modelling, and feedback to help acquire new skills and knowledge gradually. For example, teachers might scaffold children's writing skills by providing templates or graphic organisers to help structure their thoughts before composing a story independently. Similarly, a teacher might scaffold children's understanding of the scientific method during a science experiment by demonstrating each step and providing verbal cues to guide their inquiry process. Educators who scaffold learning experiences empower children to take on more complex tasks and concepts, fostering development within their ZPD and promoting cognitive growth (Loizou & Olymbiou, 2023; Syrjamaki et al., 2023).

Furthermore, Vygotsky's emphasis on language as a fundamental tool for learning underscores the importance of verbal interactions in early childhood settings. Language, according to Vygotsky, serves as both a means of communication and a mechanism for internal thought development. Educators can apply this principle by encouraging children to articulate their thinking, engage in storytelling, participate in group discussions, and use language to negotiate ideas and solve problems collaboratively. This interactive approach

not only strengthens literacy and communication skills but also fosters social-emotional development by helping children learn to express themselves, listen to others, and work cooperatively.

In addition, Vygotsky's theory supports the role of play as a critical medium for learning. Through imaginative play, children engage in symbolic thinking, role-playing, and problem-solving, all of which contribute to cognitive and social development. Educators can enhance learning by incorporating structured and unstructured play activities that allow children to explore concepts in an engaging and developmentally appropriate manner (Lundy et al., 2024).

***Bronfenbrenner's Ecological Theory:*** According to Sanders and Farago (2018), DAP is also based on the social and cultural contexts in which children develop, resulting in unique manifestations of particular practices and achievements. The major theoretical formulation that supports it was Uri Bronfenbrenner's eco-cultural theory. According to Bronfenbrenner, the development of the individual is situated within a web of concentric circles in which historical events, societal changes, institutions, and interpersonal interactions interact to influence the development of the individual.

Also, a recent concept of Barbara Rogoff's Sociocultural theory interpreted culture as the participation of individuals with each other. Culture, in this sense, is not static but a —mutually constituting process in which the individual is not viewed as nested or influenced by cultural processes but rather as a participant in the creation of cultural communities. Culture transcends ethnic, national, and racial boundaries, and an individual participates in more than one cultural community. Culture is not separate from the individual but is created by the individual. DAP establishes a broader understanding of culture beyond ethnic or racial categories, consistent with Rogoff's theory, as culture is often discussed in the context of diversity or multiculturalism, people fail to recognise the powerful role that culture plays in influencing the development of all children.

***Erik Erikson's Psychosocial Theory:*** Erik Erikson's psychosocial theory proposes a series of eight stages that individuals progress through as they develop from infancy to adulthood. Each stage presents a unique challenge or conflict that must be resolved for healthy development. In early childhood education, DAP takes into account Erikson's stages, such as trust versus mistrust, autonomy versus shame and doubt, and initiative versus guilt, to

ensure that children's social and emotional needs are met and that they develop a sense of trust, autonomy, and competence.

According to Erikson, preschool-aged children primarily navigate the stage of initiative vs. guilt, where they develop confidence in their ability to explore, create, and take on new challenges. A supportive learning environment that encourages child-led exploration, decision-making, and creativity helps children build a sense of initiative without fear of failure. Additionally, the preceding stages - trust vs. mistrust and autonomy vs. shame and doubt - play foundational roles in shaping a child's learning experience. When children experience consistent and responsive caregiving, they develop trust in their surroundings, fostering a secure attachment to teachers and a willingness to engage in learning activities. Similarly, as children assert their independence and autonomy, they benefit from structured choices and opportunities for self-expression, which contribute to their confidence in emergent literacy and numeracy.

A DAP-based curriculum integrates these principles by providing predictable routines, offering choices in learning activities, and using positive reinforcement to encourage persistence. Research indicates that social-emotional competence is closely linked to academic readiness, as children who feel emotionally secure and confident are more likely to engage in literacy-rich experiences, such as storytelling, phonological awareness activities, and numeracy games (Hyson, 2008; Lonigan & Shanahan, 2010). By embedding Erikson's psychosocial principles into the curriculum, educators ensure that children develop the social and emotional resilience needed for a smooth transition to primary school while building strong foundational Literacy and Numeracy Skills.

In conclusion, Developmentally Appropriate Practice (DAP) provides a comprehensive, research-based framework that empowers early childhood educators to make informed, intentional decisions that support the holistic development of young children. Grounded in core considerations of commonality, individuality, and context, and supported by foundational theories such as those of Piaget, Vygotsky, Erikson, and Bronfenbrenner, DAP emphasises the importance of aligning teaching practices with children's developmental stages, cultural backgrounds, and lived experiences. By integrating age-appropriate, individually tailored, and culturally responsive strategies, educators can create inclusive, engaging, and effective learning environments. Ultimately, the thoughtful

application of DAP not only fosters children's academic readiness but also supports their social, emotional, and cognitive well-being, laying a strong foundation for lifelong learning and success.

#### **D. DEVELOPMENTALLY APPROPRIATE PRACTICE (DAP) AS A STRATEGIC FRAMEWORK TO ADDRESS THE LIMITATIONS OF PRESCHOOL EDUCATION IN INDIA**

By adopting a qualitative method, Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA), the shortcomings of ECCE in India were explored and identified in the previous section B. That section also categorised the identified shortcomings into five significant areas. As a next step, these five areas are aligned with the five dimensions as outlined by NAEYC on DAP, with the realisation of its importance and effectiveness. Accordingly, the following section details the answer to the second question: How can the globally acclaimed DAP in Preschool discourse help in overcoming the shortcomings?

To derive a justifiable answer, the investigator mapped the five key areas of shortcomings within the five key dimensions of the globally acknowledged DAP approach of ECCE as posited by NAEYC. Accordingly, the shortcomings in the key areas of curriculum as mapped with the first dimension —Constructing appropriate curriculum with attention to both content and strategies|. Secondly, the shortcomings relevant to the classroom environment were mapped with the second dimension of NAEYC, —Creating a caring community of learners|. Thirdly, the challenges grouped under the area of the teaching-learning process were mapped with the third dimension —Teaching to enhance development and learning|. Fourthly, the uses of ECCE in India relevant to the assessment procedures were mapped with —Assessing children's development and learning|. Lastly, the challenges encountered in involving the community in ECCE services were mapped with —Establishing reciprocal relationships with families|.

Subsequently, as a next step, the investigator attempted to derive a potential solution/ strategy by integrating the shortcomings with the researched benefits of DAP-based ECCE that could a change in the Indian setting. Each of the potential solutions/strategies was substantiated with the nine basic principles of learning and development and three core considerations outlined by NAYEC in its position statement.

***Dimension 1: Constructing an appropriate curriculum with attention to both content and strategies***

Many early childhood institutions in India lack developmentally appropriate curriculum frameworks tailored to different stages of child development, resulting in unstructured and age-inappropriate learning experiences. A significant number of institutions operate without a formal and structured curriculum, leading to inconsistent and unstandardised education. Furthermore, most preschools fail to align their practices with recognised curriculum standards or education policies, undermining the goals of regulated early childhood education. There is also a persistent misalignment between learning standards, the implemented curriculum, and the quality of programs offered at ECCE centres, which compromises their ability to meet developmental milestones effectively.

For the question of how DAP helps to overcome these shortcomings, the following potential solutions/strategies were identified:

- Develop a common DAP curriculum for each stage that reflects developmental milestones and appropriate early learning goals for children, supporting individualised and optimal learning
- Make it mandatory for all preschools to follow DAP. Placing well-trained teachers in preschools in all settings will ensure the creation of a learning environment that meets children's developmental needs, helping educators design effective activities and curricula even with limited resources, and
- The government should create a unified DAP curriculum that aligns with developmental standards, supported by improved teacher training and continuous assessments to ensure curriculum alignment, learning standards, and programme quality across all centres.

While the strategies outlined above provide valuable direction, they may not be fully adequate on their own. To effectively overcome these shortcomings, several DAP principles outlined by NAEYC provide essential guidance. Principle 1 highlights that development and learning are dynamic processes that reflect the complex interplay between a child's biological characteristics and the environment, each shaping the other as well as future patterns of growth, necessitating a curriculum that is flexible and responsive to individual differences. Principle 2 highlights the interconnection of all developmental domains -

cognitive, social-emotional, linguistic, and physical - confirming that learning experiences or development are holistic and integrated. Principle 3 states that play is essential for all children, from birth through age 8, it promotes joyful learning that fosters greater complexity, self-regulation, and symbolic capacities, describing a scaffolded approach where children experience and build knowledge through hands-on, meaningful experiences. Principle 4 acknowledges that children's Development and learning follow general patterns, recognises that learning occurs within multiple social and cultural contexts, emphasising the need to integrate culturally relevant materials, real-life connections in the curriculum. Additionally, Principle 5 stated that Children are active learners from birth, gaining knowledge through relationships, interactions with their environment, and experiences. They learn best through exploration, meaningful engagement, and hands-on activities.

By implementing these DAP principles in the curriculum, ECCE centres in India can move towards structured, high-quality, developmentally appropriate, and standardised early education, which enhances children's learning experiences and developmental outcomes and fosters a strong foundation for lifelong learning.

### ***Dimension 2: Creating a caring community of learners***

The quality of early childhood education in India is further hindered by a high teacher-child ratio, lack of interaction, poor classroom management, overcrowded classrooms, and insufficient legal provisions for teacher training and regulations. A high teacher-child ratio limits individual attention, reducing opportunities for meaningful teacher-child interactions. This lack of interaction affects children's social, emotional, and cognitive development during critical formative years. Poor classroom management exacerbates these issues, as teachers struggle to maintain order and create an engaging learning environment, particularly in overcrowded classrooms. Overcrowding affects both the teacher's ability to manage the class and the children's ability to focus, participate actively, and feel valued. Additionally, the absence of legal provisions requiring comprehensive teacher training and regulation leaves many educators unprepared to address these challenges. Without proper training in developmentally appropriate practices, classroom management, and inclusive teaching strategies, teachers are ill-equipped to meet the diverse needs of children, leading to inconsistent teaching quality that undermines the overall objectives of early childhood education.

As with the previous dimension, the following dimension also led to the identification of several potential solutions and strategies, listed below in response to the question of how DAP helps to overcome these shortcomings.

- Recruiting and training ECCE teachers is crucial. Promoting small group activities, peer learning, and independent play reduces the need for constant supervision, while flexible classrooms and learning stations promote autonomy and meaningful teacher-child interactions
- Provide on-going teacher training on DAP best practices, promote teamwork, and involve families in supporting development. Regularly evaluate and adjust DAP implementation based on feedback to enhance the learning environment
- The government should mandate a DAP-based curriculum in all schools and ensure teachers receive training in flexible grouping, structured routines, effective classroom design, and behaviour management, and
- Enhance teacher capacity through comprehensive training based on NCTE and DAP norms, with a focus on hands-on experiences and an upgraded curriculum.

Also, the challenges identified under Dimension 2 of DAP, —Creating a Caring Community of Learners, can be effectively addressed based on the application of five out of the nine principles of DAP. Principle 1, which emphasises the dynamic processes of development and learning, helps by ensuring that teachers recognise and respond to each child's unique developmental needs, thus creating a more individualised and supportive community where every child can grow. Principle 4, which focuses on the importance of considering cultural contexts, experiences, and individual differences, directly supports overcoming challenges by fostering an inclusive environment where diversity is respected and valued, allowing all children to feel welcomed and understood. Principle 5 emphasises that children are active learners who build meaning through relationships and interactions with their environment. This encourages a learning community where children engage in collaborative play and problem-solving, promoting social and emotional growth within a caring community. Principle 6, which underscores the importance of a learning environment that fosters a sense of belonging, purpose, and agency, supports overcoming challenges by ensuring children feel valued and empowered in the classroom, strengthening their connection to the community. Lastly, Principle 9, which highlights the responsible use of technology, helps by facilitating collaboration and communication among children,

allowing them to engage with each other and their environment in meaningful ways, further promoting a sense of community. Together, these principles ensure that the learning environment is not only developmentally appropriate but also deeply nurturing, where children feel supported, valued, and connected.

### ***Dimension 3: Teaching to enhance development and learning***

The predominance of formal instruction in the 3Rs (reading, writing, arithmetic) and rote memorisation in many ECCE centres in India overshadows the play-based and experiential learning approaches essential for young children's holistic development. Many Anganwadi centres lack teaching materials, depriving children of hands-on, exploratory learning opportunities. Moreover, outdated teaching methods fail to align with developmentally appropriate practices, and underpaid teachers face low motivation and high turnover, further compromising educational quality.

In response to the identified shortcomings, the following solutions have been proposed.

- Development and rollout of common DAP curriculum emphasising experiential, play-based learning, fosters critical thinking, and aligns activities with each child's developmental stage and interests
- Ensure age-appropriate, locally available, and open teaching and learning materials for the children in the classroom
- Government authorities should implement regular, thorough in-service training programs for teachers, focusing on child development, hands-on learning methods, and personalised instruction to develop a DAP learning environment, and
- Enhancing the funding and resource allocation and providing exclusive DAP-based training equips teachers with advanced skills, keeping them competitive and focused on development, leading to promotions, higher pay, and leadership roles.

Additionally, several principles of DAP outlined by NAEYC offer valuable guidance to help overcome these shortcomings are as given below. Principle 2, which emphasises the importance of addressing all domains of child development—physical, cognitive, social-emotional, and linguistic—guides teachers to create balanced and comprehensive learning experiences that foster growth in every area. Principle 3 highlights the essential role of play in promoting joyful learning, which encourages self-regulation, language development, and cognitive and social skills. By integrating play-based learning, educators can engage

children in meaningful experiences that enhance development. Principle 5, which focuses on children as active learners who engage with their environment and relationships, encourages teaching practices that are interactive and child-centred, allowing children to take ownership of their learning. Principle 6 underscores the importance of fostering a sense of belonging, purpose, and agency, motivating children to actively participate in their learning process. By creating an environment where children feel valued and connected, teachers can enhance their motivation to learn. Finally, Principle 8 stresses the need for appropriate challenges just beyond a child's current abilities, promoting skill development and mastery through reflection and practice.

#### ***Dimension 4: Assessing children's development and learning***

The absence of a structured monitoring and evaluation framework and unsystematic developmental assessments presents additional challenges in ensuring quality education and tracking children's progress. Without a comprehensive monitoring and evaluation system, it is difficult to assess the effectiveness of ECCE programs and identify areas for improvement, resulting in inconsistencies in program quality. Additionally, unsystematic developmental assessments often lack standardisation and alignment with developmental milestones, limiting their ability to accurately track children's growth. This makes it challenging to design targeted interventions that address specific developmental needs. The lack of rigorous evaluation means that ineffective practices may continue, and resources may be misallocated.

To address these challenges, a few solutions are provided below:

- There should be regular assessment of the ECCE programme to monitor children's progress and development, and
- Link assessment to curriculum and early learning standards and use authentic assessment methods to measure a child's progress

To address the gaps mentioned above, the principles of DAP can serve as a solution. Among them, Principle 4 directly applies to overcoming these challenges, which emphasises the need to consider cultural contexts, experiences, and individual differences, guiding educators to conduct individualised assessments that reflect the diverse backgrounds of each child. This ensures that assessments are fair and accurate. Principle 5, which highlights that children are active learners, encourages ongoing, dynamic

assessments that capture a child's engagement with their environment and learning process, rather than just static evaluations of their abilities. Additionally, Principle 8, which focuses on providing challenges just beyond a child's current mastery, informs assessments by ensuring they are used as tools to guide children to the next level in their development through reflective opportunities.

#### ***Dimension 5: Establishing reciprocal relationships with families***

Lastly, the lack of parental and community involvement in ECCE programs, combined with ineffective communication between preschool teachers and families, significantly hinders the development and success of early childhood education. When parents are not actively involved in their children's learning, children miss out on vital reinforcement and support at home. The lack of communication also means that parents are often unaware of their child's progress, developmental milestones, or the curriculum being followed, leading to a disconnect between the home and school environments. Moreover, when parents lack knowledge about early childhood care, they may not understand the importance of developmentally appropriate practices or how to support their child's learning at home, which can impact children's readiness for school and overall development.

To tackle these challenges, the following solutions have been proposed below:

- Work in partnership with families to learn about each child, to develop two-way communication, and to establish supportive relationships with all families, and
- Build positive and responsive relationships between children, staff, and families, both among groups and within the program, to create a community that supports all children as they develop and learn to their capacity in all domains.

Moreover, two principles of DAP directly support the development of strong, collaborative connections between educators and families. Principle 6, which emphasises the importance of fostering a sense of belonging, purpose, and agency by connecting children's experiences in school to their home and community settings, plays a key role in establishing reciprocal relationships. It encourages educators to work closely with families, creating a bridge between the child's learning environment at school and home. This collaboration ensures that children's experiences are valued and reinforced across both settings. Additionally, Principle 7, which highlights the need for educators to have a deep understanding of subject-area knowledge and teaching strategies, enables teachers to

effectively communicate with families. When educators are well-versed in the learning process, they can share this knowledge with families, empowering them to support their children's learning at home.

In summary, India's early childhood education system faces persistent challenges, including unstructured curricula, inadequate teacher training, poor classroom environments, limited assessment practices, and weak family engagement. This review demonstrates how Developmentally Appropriate Practice (DAP), as outlined by the NAEYC, offers a comprehensive and evidence-based framework to address these shortcomings. By mapping the identified limitations in ECCE to DAP's five key dimensions, this study proposes practical, targeted strategies rooted in globally recognised pedagogical principles.

Implementing a standardised, flexible DAP-aligned curriculum, improving teacher preparation and classroom management, embedding authentic assessment methods, and fostering strong school-family partnerships can collectively transform the quality of preschool education in India. Furthermore, aligning these reforms with the National Education Policy (NEP) 2020 ensures policy coherence and sustainability.

Ultimately, adopting DAP is not just a pedagogical choice. It is a strategic imperative for achieving equitable, inclusive, and high-quality early education in India. It empowers educators to meet each child's developmental needs, supports lifelong learning, and lays the foundation for a more capable and compassionate generation.

## **E. EMERGENT LITERACY AND NUMERACY SKILLS IN PRESCHOOLERS: SIGNIFICANCE AND THEORETICAL UNDERPINNINGS**

Education systems are responsible for developing diverse abilities, including reading, numeracy, reasoning, socio-political, professional, cultural, and others. However, children in different countries lack basic literacy and numeracy skills despite years of education (Bashir & Jan, 2023). Early childhood is the developmental stage when children develop at their fastest rate and are most influenced by their environments. This is also when the early literacy and numeracy skills create a foundation for future reading and mathematical skill development: symbolic and non-symbolic numeracy skills, assessed before school entry, have been shown to predict later mathematical skills (Chu et al., 2018; Geary et al., 2018; Koponen et al., 2019; Schneider et al., 2017), and early language and

literacy skills have been shown to predict reading skills (Hjetland et al., 2020; Psyridou et al., 2018).

Early childhood is widely recognised as a critical period for the development of foundational skills that are vital for later academic success. Among these, emergent literacy and numeracy skills are crucial as they lay the groundwork for future proficiency in reading, writing, and mathematics. Emergent literacy encompasses early skills that precede formal reading and writing instruction, including phonological awareness, print awareness, and vocabulary development (Blevins-Knabe & Austin, 2019). Similarly, emergent numeracy includes early understandings of number sense, counting, and basic mathematical concepts (Jordan, Kaplan, & Ramineni, 2017). These early skills are not only predictors of future academic performance but also contribute to the development of essential cognitive abilities, including problem-solving and critical thinking (Blevins-Knabe & Austin, 2019).

Research conducted in recent years has highlighted the importance of emergent literacy and numeracy as foundational competencies for later academic achievement. Many studies have found that children who develop strong early literacy and numeracy skills are more likely to succeed in later grades, emphasising the need for interventions that target these domains at an early age. Furthermore, these skills also play a crucial role in developing cognitive flexibility and executive functioning, which are critical for learning and problem-solving in both academic and real-life contexts (Blevins-Knabe & Austin, 2019; Jordan et al., 2017).

Globally, hundreds of millions of children pass through school systems without mastering basic Literacy and Numeracy Skills (World Bank, 2019). In the Indian milieu, Foundational literacy and numeracy (FLN) is the education of children from 3 to 8 years. As per the National Education Policy (NEP 2020), FLN spans from preschool up to grade 2. Foundational literacy is the capability to comprehend and distinguish letters, read well-known words, and establish various forms of communication. Literacy assists students to read, write and speak clearly. Foundational numeracy is understanding and identifying numbers, discriminating between numbers, and performing basic mathematical calculations (addition or subtraction). Future education and lifetime learning both depend on the capacity to read, write, and execute basic mathematical operations. People with these skills can think critically and creatively, which advances the country (GOI, NEP 2020). The

National Education Policy (2020) places a high priority on the attainment of Foundational Literacy and Numeracy (FLN) by all children by the completion of class 3 as an urgent national mission (Bashir & Jan, 2023).

The Economic Advisory Council to the Prime Minister (2021) released the report on the State of Foundational Literacy and Numeracy in India, which highlighted the importance of early education years in the overall development of a child. The report underlined the role of well-planned early interventions like NEP-2020 and NIPUN Bharat guidelines in leading to long-term improved learning outcomes. The report also stated that access to quality early childhood education is a fundamental right of every child, and the early years of a child's life should be understood in the backdrop of the socio-economic, psychological, and technological hindrances they face, which affect the potential of a child in different ways.

The magnitude of Foundational Literacy and Numeracy (FLN) is reflected in the scene that the children who do not learn to read with comprehension in the foundational years struggle to do so in later years. This is popularly termed the Matthew Effect. While the grade-level content advances, the learners continue to slide behind. The divide and the gap between the children struggling with reading in the early years and those who are proficient readers continue to deepen (Kapoor et al., 2021).

The preschool years provide a unique opportunity for nurturing these skills through structured and unstructured learning experiences. Research has shown that children's experiences in their home environment, as well as their interactions with teachers and caregivers in early childhood settings, significantly influence the development of these skills (Goodall & Vorhaus, 2019). Despite growing awareness of their importance, there remains a need to better understand how emergent literacy and numeracy skills are developed in preschool children, particularly in the context of different educational environments, curricula, and instructional strategies (Hall, 2018).

The role of early childhood education (ECE) in fostering these skills cannot be overstated. Research indicates that children who receive early instruction in both literacy and numeracy are better prepared for academic challenges in later years (Goodall & Vorhaus, 2019). Additionally, the integration of home and school learning experiences is crucial, as parental involvement in early education can significantly enhance

a child's cognitive development. Despite the recognition of these factors, there is still limited research on how specific educational practices, curricula, and environmental influences impact emergent literacy and numeracy skills in preschoolers.

The theoretical frameworks guiding the development of emergent literacy and numeracy have evolved, with a continued emphasis on the influence of social and environmental contexts in cognitive development. Central to this is Vygotsky's sociocultural theory, which underscores the role of social interaction in shaping cognitive abilities. According to Vygotsky, cognitive development is fundamentally a social process, facilitated through interactions with more knowledgeable individuals (e.g., teachers, peers, caregivers). This interaction is crucial for developing emergent literacy and numeracy skills as children learn and internalise these concepts through joint activities, such as reading together or solving problems collaboratively. Recent studies have reinforced Vygotsky's assertion that social contexts, such as classroom environments and family interactions, play a significant role in the development of literacy and numeracy skills, particularly in early childhood (McLoughlin et al., 2021).

Piaget's cognitive development theory, which emphasises that children actively construct knowledge through their interaction with the environment (Piaget, 1952), also provides valuable insight into emergent literacy and numeracy. Piaget's ideas are reflected in current research on how young children develop early mathematical concepts and literacy through play and exploration. In the context of numeracy, children's ability to understand number sense, count, and perform basic mathematical operations is seen as the result of their active engagement with objects and their environment (Duncan & Rowe, 2020). In literacy, Piaget's theory is evident in the ways that children engage with print, form letters, and associate sounds with symbols during their interactions with written material.

Bronfenbrenner's ecological systems theory (2005) adds another layer of understanding to the development of emergent literacy and numeracy by considering the broader environmental influences on children's learning. According to Bronfenbrenner, the child's development is influenced by a series of nested environments, such as the home, school, and community. Recent research highlights the significant role of these systems in shaping early literacy and numeracy development. For example, studies have found that positive parental involvement in literacy activities, such as shared reading, is closely linked to the development of both literacy and numeracy skills in preschool children (Hughes et

al., 2021). Additionally, the quality of early childhood education settings, characterised by rich language interactions and mathematical exploration, plays a pivotal role in fostering emergent literacy and numeracy (Lynch & Vasquez, 2019).

More recent perspectives on emergent literacy and numeracy development incorporate a dynamic, transactional view of learning, emphasising the interaction between the child and their environment. This approach stresses the need for a comprehensive understanding of how children's cognitive abilities are shaped by continuous feedback from their social and physical surroundings (Berk, 2017). For example, children's ability to recognise sounds and letters, or to understand number concepts, is not only a result of innate cognitive abilities but is also significantly influenced by environmental inputs, such as the availability of learning resources, exposure to language, and interaction with caregivers and peers (Ginsburg, 2019).

Recent studies have also focused on how digital tools and technology can enhance emergent literacy and numeracy skills, adding a new dimension to Bronfenbrenner's theory. Technology can serve as a powerful medium for scaffolding learning, particularly in areas where access to traditional educational resources may be limited. According to Chien and Lee (2020) demonstrates that interactive apps designed for young children can support the development of early numeracy and literacy by providing engaging and repetitive practice in recognising letters, sounds, and numbers. However, these technological interventions are most effective when combined with the social and environmental contexts emphasised by Vygotsky and Bronfenbrenner.

In India, early childhood education has gained increased attention, particularly concerning emergent literacy and numeracy. The National Education Policy (NEP) 2020 has highlighted the importance of foundational literacy and numeracy, recognising these as critical areas for ensuring children's future success. However, the implementation of developmentally appropriate practices in India is still a work in progress. Despite the growing awareness of DAP, many preschools and Anganwadis (community-based childcare centres) continue to follow traditional, teacher-centred approaches that may not fully support the developmental needs of young children (Agarwal & Bhat, 2020).

In recent years, research has increasingly highlighted the essential role that early literacy and numeracy skills play in shaping a child's long-term academic success. Studies emphasise that crucial preschool experiences are for laying a strong foundation for later

literacy and numeracy achievement (Blevins-Knabe et al., 2018). At this stage, preschoolers develop key literacy skills such as phonemic awareness, letter recognition, and vocabulary expansion through interactive, play-based activities like storytelling, singing, and rhyming. These playful methods help children understand the connection between spoken and written language, which is vital for their early reading development (Cunningham & Zibulsky, 2020). By engaging in such activities, children not only build their language skills but also develop a deeper understanding of the world around them.

According to Purpura, Schmitt, and Ganley (2017), emergent literacy and numeracy skills are influenced by different home and classroom experiences and may benefit from targeted instructional strategies. Their study found that emergent literacy skills, such as phonological awareness and vocabulary, are strongly associated with language-rich environments, whereas emergent numeracy skills, like number sense and spatial reasoning, are more closely tied to structured math-related interactions and activities. This distinction highlights the need for domain-specific instructional approaches, especially in early childhood settings where foundational skills are formed.

According to Smith and Lee (2022), found that high-quality ECE programs that support individual learning styles have a significant impact on early literacy and numeracy skills. These programs help bridge the gap for children who may not have rich home learning experiences. Teachers who scaffold learning effectively (i.e., providing support that helps children progress just beyond their current abilities) facilitate better outcomes in early literacy and numeracy.

Emergent literacy and numeracy skills are foundational components of preschool education, forming the bedrock for a child's future academic success and overall development. These skills are deeply interconnected, with literacy supporting numeracy through language comprehension and numeracy reinforcing literacy through logical reasoning and problem-solving (Clements & Sarama, 2021; National Early Literacy Panel, 2008). Developing these competencies in early childhood not only prepares children for the transition to formal schooling but also fosters cognitive, social, and emotional growth (Berk & Meyers, 2019; Copple & Bredekamp, 2009). By integrating developmentally appropriate practices and creating enriching learning environments, educators and caregivers can ensure that preschoolers build the strong foundational skills necessary for lifelong learning and success (NAEYC, 2020).

Moreover, fostering emergent literacy and numeracy skills early on helps children develop a sense of confidence in their abilities, which is crucial for their self-esteem and motivation as they continue their education. Recent studies emphasise that early numeracy skills are strong predictors of later academic success, not only in mathematics but also in reading, due to their influence on cognitive processes such as logical reasoning and problem-solving. Similarly, a rich home literacy environment and the development of emergent literacy skills, such as phonological awareness and vocabulary, have been shown to support reading and writing outcomes in primary school (Pinto et al., 2023).

By integrating developmentally appropriate practices and creating enriching learning environments, educators and caregivers can ensure that preschoolers build the foundational skills necessary for lifelong learning and success. These practices include play-based learning, hands-on exploration, and interactive group activities that promote active engagement and deeper understanding. Research across countries shows that the quality of early learning environments, both at home and in preschool, significantly influences children's emergent literacy and numeracy development (Chan & Rao, 2023). Additionally, children who do not attend early childhood education programs are at higher risk of underperforming in early literacy and numeracy domains (Sosu & Pimenta, 2023).

As children engage in these meaningful experiences, they develop a stronger grasp of the world around them and are better equipped to handle academic challenges in the future. Ultimately, a solid foundation in both emergent literacy and numeracy lays the groundwork not only for school readiness but for children's overall growth, confidence, and long-term academic achievement.

## **E. CONCEPTUAL FRAMEWORK GUIDING THE PRESENT STUDY**

The —Effectiveness of a Developmentally Appropriate Practice-Based Curriculum Framework Focused on Emergent Literacy and Numeracy Skills of Preschoolers‖ study was framed in response to the critical concerns, gaps, and challenges observed in India's ECCE system. Despite the recognition that the ages between 3–6 years are crucial for developing pre-literacy and pre-numeracy skills due to rapid brain development, the sector continues to grapple with fragmented approaches, insufficient focus on Developmentally Appropriate pedagogy, and inconsistent curricular standards. These issues hinder the foundational learning required to meet the NEP 2020 mandate that all children should attain foundational Literacy and Numeracy by Grade 3.

To address these issues, the study aims to formulate, implement, and analyse a DAP-based curriculum framework designed to enhance Emergent Literacy and Numeracy Skills in preschoolers aged 3–6 years. The curriculum was planned to be implemented particularly with 4–5-year-old children, as they represent a consistent and developmentally crucial stage within the preschool system. Educators would be trained to effectively carry out the curriculum in classroom settings to ensure alignment with DAP principles.

Accordingly, the study addresses the following research questions:

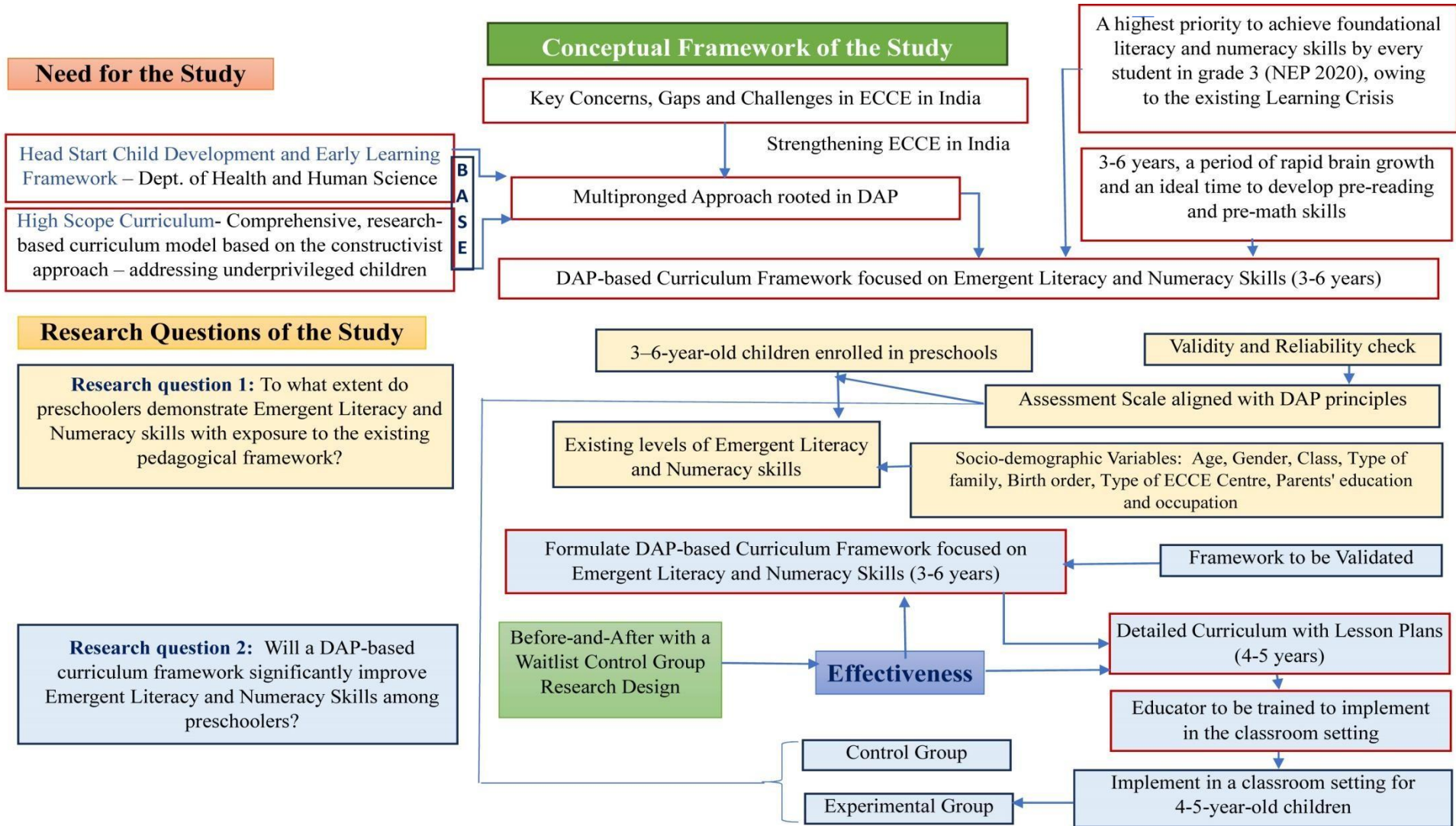
- ✓ To what extent do preschoolers demonstrate Emergent Literacy and Numeracy Skills under the existing pedagogical framework?
- ✓ Will a DAP-based curriculum framework significantly improve these skills among preschoolers?

With these research questions, the study was designed to examine both the existing levels of Emergent Literacy and Numeracy Skills and the impact of the intervention. It also takes into account various socio-demographic variables such as age, gender, class level, birth order, type of family, type of ECCE centre, and parents' education and occupation, to assess their influence on children's foundational abilities.

The research was planned to adopt a Before-and-After with a Waitlist Control Group Design, with children in the experimental group to be exposed to the DAP-based curriculum, while the control group to follow the existing method, allowing comparative analysis of outcomes. An assessment scale aligned with DAP principles was planned to be developed and tested for validity and reliability to measure skill progression.

Additionally, the curriculum framework was based on two internationally recognised curricular frameworks, HighScope and Head Start, which offer constructivist, evidence-based practices for early childhood development. Drawing insights from these, the study proposed a multipronged and context-sensitive approach rooted in DAP to strengthen ECCE practices in India and promote equitable foundational learning outcomes.

Accordingly, the conceptual framework of the study was formulated and depicted in Figure1.



**Figure 1**