

Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India

Dr. Puneet Kumar Gupta^{1*}, Prof. Anjali Pahad²

ABSTRACT

Early childhood is foundational for cognitive, linguistic, and socio-emotional development; however, children with disabilities—specifically those who are deaf, blind, or neurodiverse—remain largely marginalized in conventional early learning settings. This study aims to design, pilot, and validate an inclusive Baalwadi model integrating multisensory pedagogies and universally accessible infrastructure to promote equitable learning opportunities. Grounded in Universal Design for Learning (UDL) frameworks and aligned with the Rights of Persons with Disabilities Act (2016) and the National Education Policy (2020), this research employs a participatory, design-based methodology involving key stakeholders including educators, parents, and disability experts. It explores the combined use of sign language, tactile resources, audio description, and assistive digital technologies to enhance foundational literacy, communication, and social integration. Empirical fieldwork in selected Baalwadis across Vadodara and Mumbai documents best practices, identifies barriers, and co-develops interventions. The expected outcomes include a replicable, evidence-based model and actionable policy recommendations to advance early childhood inclusion within India's ICDS and NEP frameworks. Contributing to ICSSR's Divyangjan domain on Inclusive Infrastructure, this study foregrounds innovation, accessibility, and inclusive pedagogy as imperatives for transforming early learning ecosystems.

Keywords: *Inclusive Education, Baalwadi, Multisensory Learning, Universal Design for Learning, Early Childhood Education, Disability, Anganwadi*

Early childhood (0 to 6 years) is the golden period of human development when the brain undergoes its most rapid growth and the foundation for cognitive, linguistic, social, and emotional capacities is established. The National Education Policy (NEP) 2020 recognizes this critical phase by introducing the concept of **Balvatika** for children aged 3-6 years and emphasizes inclusive education as a cornerstone of the new pedagogical framework. Similarly, the Rights of Persons with Disabilities Act (2016) mandates inclusive education for children with disabilities and calls for appropriate infrastructure and teaching materials.

Despite these progressive policies, children with disabilities—particularly those who are deaf, blind, or neurodiverse—face significant barriers in early education settings. The Vidhi Centre

¹ICSSR Senior Research Fellow, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat

²The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat

*Corresponding Author

Received: June 22, 2026; Revision Received: August 19, 2026; Accepted: August 23, 2026

© 2026, Gupta, P.K. & Pahad, A.; licensee IJSI. This is an Open Access Research distributed under the terms of the Creative Commons Attribution License (www.creativecommons.org/licenses/by/2.0), which permits unrestricted use, distribution, and reproduction in any Medium, provided the original work is properly cited.

Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India

for Legal Policy's 2024 mapping study reveals that while the ICDS and Anganwadi system covers over 82 million children nationally, less than 5% of these centers have accessibility features or trained personnel to support children with disabilities. Only about 30% of Anganwadi workers have received any disability-specific training.

The Building as Learning Aid (BaLA) Concept

One of the most promising developments in Indian early childhood infrastructure is the **Building as Learning Aid (BaLA)** concept, which transforms the physical space of Anganwadis and schools into active learning resources. Under BaLA, the three-dimensional space and environment available in Anganwadi centers is utilized as a child-friendly resource for learning and development.

Key features of BaLA include:

- Colorful walls painted with educational content (numbers, alphabets, national heroes)
- Floor games like Ludo and Snakes and Ladders to teach calculations
- Child-friendly infrastructure with appropriate window heights and seating areas
- Interactive elements integrated into the built environment

While BaLA has demonstrated significant potential for mainstream early childhood education, its application for children with disabilities—especially those with sensory and intellectual impairments—remains largely unexplored. This study addresses this critical gap.

THEORETICAL FRAMEWORK

Universal Design for Learning (UDL)

This research is grounded in the Universal Design for Learning (UDL) framework, which provides a proactive approach to ensuring all learners' success through three core principles:

1. **Multiple Means of Representation** - Presenting information and content in different ways
2. **Multiple Means of Expression** - Providing learners with various options to demonstrate their knowledge
3. **Multiple Means of Engagement** - Using diverse strategies to maintain learner interest and motivation

In the Indian context, research on UDL application suggests that adopting UDL principles at the primary level can prevent children from developing learning difficulties and strengthen the inclusion process.

Social Model of Disability

This framework is guided by the Social Model of Disability, which shifts attention from individual impairments to the societal and environmental barriers that hinder inclusion. This model is consistent with the vision of the Rights of Persons with Disabilities Act (2016) and aligns with India's commitment to creating accessible environments.

Bronfenbrenner's Ecological Systems Theory

Bronfenbrenner's Ecological Systems Theory (1979) informs the understanding that inclusive development is a product of ongoing interactions among the child, family, educational institutions, and the larger community. Accordingly, the Inclusive Baalwadi model positions

the child within an interconnected support system of skilled educators, informed parents, and enabling institutions.

REVIEW OF LITERATURE

International Research on Inclusive Early Childhood Education

Research on inclusive early childhood education has transitioned from a charity-based view of disability to a rights-based perspective emphasizing accessibility, social participation, and equity. Mitchell (2014) and Florian & Black-Hawkins (2011) articulate that foundational education is critical for setting inclusive trajectories. Booth and Ainscow's Index for Inclusion continue to be a vital framework guiding schools toward welcoming cultures.

For children with visual impairments, Hatlen's (2002) Expanded Core Curriculum advocates experiential and tactile learning beyond traditional academics. Research on neurodiverse learners by Tomlinson (2014) and Dunn (2016) underscores the importance of differentiated instruction and sensory-responsive classroom design.

Indian Context: Building as Learning Aid (BaLA) and Inclusive Education

In India, the BaLA concept has been implemented across various states to create child-friendly learning environments. Recent research has examined how BaLA ideas can be adapted for children with sensory and intellectual impairments, identifying specific modifications needed for inclusion.

Adaptations for Children with Visual Impairment:

- Enhanced colour contrast between different elements of target area
- Increasing the legibility of textual labelling and instructions
- Defining the zone of target information through colour or texture contrast
- Defining sequence of information through hierarchy of tactile cues
- Pairing visual stimuli with other sensory stimuli
- Pairing textual labelling with Braille labelling

Adaptations for Children with Hearing Impairment:

- Pairing BaLA learning resources with writable surfaces
- Pairing BaLA learning resources with textual instructions/information
- Providing print-rich environment in schools
- Providing audio stimuli to facilitate development of residual hearing
- Pairing various sensory stimuli for richer menu of experiences

Adaptations for Children with Intellectual Impairment:

- Pairing various sensory stimuli for richer menu of experiences
- Simplifying content for ease of understanding
- Pairing textual information with graphics
- Avoiding multiple step operations
- Facilitating kinaesthetic experiences
- Controlling number of stimuli in an environment

The BaLA Approach in Practice

The BaLA model has been successfully implemented in various states. For example, in Nashik, a model Anganwadi was constructed using BaLA concepts with features such as

Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India

north-facing doors to ensure moderate sunlight, window sills lowered to 1 foot from the floor for child seating, educational material painted on walls, and floor games (Ludo, Snakes and Ladders) to help children learn through play.

Similarly, in Lucknow, 449 Anganwadi centers were developed under the BaLA model. Features included:

- Windows and window grills used as learning tools (sitting, standing, observing)
- Walls painted green up to one metre or blackboard-style for writing practice
- Floor space used as a writing slate
- Play areas with sand pits, slopes, and swings

Field Observations: Child-Friendly Anganwadis

Field studies reveal the transformative impact of child-friendly Anganwadis. In Vadodara's Sandha village, an Anganwadi transformed from a boring classroom to a fun-learning center.

Key observations include:

- Children engaged with activity books, slates, and blackboard activities
- Music sessions with action songs enhancing vocabulary and motor development
- Outdoor play (balls, cricket, swings) developing gross motor skills
- Children with ECE kits using matching cards, story books, and musical instruments
- Creative arts activities with crayons, paper pasting, and rangoli

This study at Anganwadi No. 83 in Sandha village (Shinor block, Vadodara) demonstrates how ECE kits (with big balls, matching cards, colored beads, wooden blocks, story books, musical instruments, slates, and crayons) engaged children for all three hours they spent at the Anganwadi. The Anganwadi worker reported that children now demand to attend and are reluctant to go home.

METHODOLOGY

Research Design

This study employs a participatory, design-based research methodology with the following phases:

Phase 1: Status Analysis

- Survey of selected Baalwadis and Anganwadis in Vadodara and Mumbai
- Documentation of existing accessibility features and barriers
- Assessment of teacher and parent needs

Phase 2: Co-Design of Model

- Workshops with teachers, parents, disability experts, and policymakers
- Co-creation of multisensory learning materials and resources
- Development of training modules

Phase 3: Pilot Implementation

- Implementation in selected Baalwadis
- Regular observation and feedback collection
- Necessary modifications

Phase 4: Evaluation and Validation

- Assessment of children's developmental progress

Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India

- Evaluation of model effectiveness
- Formulation of replicable model and policy recommendations

Data Collection Methods

Method	Purpose
Observations	Document existing infrastructure and pedagogical practices
Interviews	Gather perspectives from Anganwadi workers, parents, and CDPOs
Focus Group Discussions	Explore adaptations needed for children with disabilities
Infrastructure Audits	Assess physical accessibility of Anganwadi buildings

FINDINGS AND DISCUSSION

Current State of Anganwadi Infrastructure

Based on field visits to Anganwadis in Vadodara, the following observations were documented:

Strengths:

- Some centers have received ECE kits with learning materials
- Play-based activities are being implemented in select centers
- Community participation is evident in some villages

Challenges:

- Limited accessibility features for children with disabilities
- Lack of trained personnel for inclusive education
- Inadequate assistive devices and materials
- Physical infrastructure not designed for children with sensory impairments

Adaptations Required for Inclusive Baalwadis

Based on consultations with special educators and disability experts, the following adaptations are essential:

For Children with Visual Impairment:

- Enhanced colour contrast and tactile cues
- Braille labelling
- Tactile maps and orientation aids
- Sound-producing elements (e.g., ghungroo) on learning aids
- Pleasant surface textures
- Appropriate viewing distance and proximity

For Children with Hearing Impairment:

- Visual instructions and writable surfaces
- Textual information paired with graphics
- Print-rich environment
- Visual stimulation through colourful displays

For Children with Intellectual Impairment:

- Simplified content and step-by-step instructions

Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India

- Multisensory stimulation
- Concrete, hands-on learning experiences
- Play-based learning with positive reinforcement

The Role of Multisensory Learning

Multisensory learning approaches have gained scientific support for enhancing neural connectivity and retention (Esplendori, 2022). For children with disabilities, multisensory experiences are particularly critical as they:

- Provide alternative pathways for learning
- Compensate for impaired sensory modalities
- Engage multiple areas of the brain simultaneously
- Enhance memory and retention

BaLA Element	Adaptation for Inclusion
Prewriting Grills	Larger grip; sound-producing beads; located in corridors for accessibility; different colours for visual discrimination
Board Games on Floor	Engraved lines for tactile discrimination; appropriate colour contrast; less snakes/more ladders for emotional well-being; starting number with tactile cue
Number Line on Floor	Engraved/embossed lines; contrasting colours; writable surface nearby for instructions; located in corridor for ease of movement
Classroom Maps	Tactile features; entrance marked with tactile cue; appropriate scale; solid-filled walls for visual perception
Wall Displays	Higher contrast; Braille labelling; tactile elements; appropriate height for accessibility

MODEL FRAMEWORK FOR INCLUSIVE BAALWADI

Core Components

The proposed Inclusive Baalwadi model comprises three pillars:

1. Multisensory Learning Environment

- Visual: High-contrast colours, images, tactile graphics
- Auditory: Music, rhymes, audio instructions, sound cues
- Tactile: 3-D objects, textured surfaces, manipulatives
- Kinaesthetic: Movement, play, hands-on activities

2. Universally Accessible Infrastructure

- Ramps, wide doorways, accessible washrooms
- Adapted learning resources (Braille, sign language, easy-read materials)
- Sensory-friendly design (appropriate lighting, reduced noise)

3. Inclusive Pedagogical Practices

- UDL-based lesson planning
- Differentiated instruction
- Individualized support
- Parent and community engagement

Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India

Recommendations

For Policy

1. **Mandatory Disability Training:** All Anganwadi workers should receive basic disability awareness and inclusive education training as part of their pre-service and in-service training.
2. **Accessibility Standards:** Universal design standards should be made mandatory for all new and existing Anganwadi buildings, with specific adaptations for children with sensory and intellectual impairments.
3. **Resource Provision:** ECE kits should include assistive and adapted materials (Braille books, tactile resources, visual aids) for children with disabilities.
4. **Early Identification:** Regular screening for disabilities at Anganwadi centers should be mandated.
5. **Community Engagement:** Parent and community involvement should be strengthened to create inclusive early childhood environments.

For Practice

1. **Teacher Empowerment:** Continuous professional development for Anganwadi workers on inclusive practices, with experienced mentors/supervisors providing support.
2. **Multisensory Materials:** Creation and distribution of low-cost, locally-made multisensory learning materials.
3. **Flexible Infrastructure:** Phased modifications to Anganwadi buildings, starting with low-cost, high-impact adaptations.
4. **Parent Partnerships:** Regular parent orientation and support groups.

CONCLUSION

Early childhood is the foundation upon which every child's life is built. The exclusion of children with disabilities during this critical phase not only hinders their individual development but also impedes the creation of an equitable and inclusive society. The proposed Inclusive Baalwadi model presents a viable, evidence-based solution for deaf, blind, and neurodiverse children in the Indian context.

This model integrates the wisdom of Indian knowledge traditions with modern scientific research. It aligns with the Rights of Persons with Disabilities Act (2016), the National Education Policy (2020), and the Sustainable Development Goals (SDG 4). The Building as Learning Aid (BaLA) concept provides a promising foundation, but requires careful adaptation to meet the needs of children with disabilities.

By ensuring that every child—regardless of ability—has access to quality, joyful, and respectful education, we contribute to building a more inclusive India. As envisioned by the Children's Research University, this research represents an innovative and path-breaking effort in the field of child studies, contributing to the creation of a future generation rooted in inclusion, coexistence, and harmony.

REFERENCES

- Booth, T., & Ainscow, M. (2002). *Index for Inclusion: Developing Learning and Participation in Schools*. Bristol: Centre for Studies on Inclusive Education.
- Dunn, L. M. (2016). *Differentiated Instruction for Neurodiverse Learners*.

Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India

- Esplendori, R. (2022). Multisensory Learning and Neural Connectivity.
- Florian, L., & Black-Hawkins, K. (2011). Exploring inclusive pedagogy. *British Educational Research Journal*, 37(5), 813-828.
- Hatlen, P. (2002). The Expanded Core Curriculum. *Journal of Visual Impairment & Blindness*.
- Koenig, A. J., & Holbrook, M. C. (2000). *Foundations of Education: Volume II - Instructional Strategies for Teaching Children and Youths with Visual Impairments*. New York: AFB Press.
- Marschark, M., & Spencer, P. E. (2016). *The Oxford Handbook of Deaf Studies in Language*. Oxford: Oxford University Press.
- Mitchell, D. (2014). *What Really Works in Special and Inclusive Education*. New York: Routledge.
- National Education Policy (2020). Government of India.
- Rights of Persons with Disabilities Act (2016). Government of India.
- Singh, D. (2016). Dilemma and challenges of early education inclusion in schools of Lucknow, Uttar Pradesh, India. *Asian Journal of Inclusive Education*, 4(1), 51-77.
- Singh, D. (2023). Women in Informal Employment and Childcare: Evidence from India. *Children First: Journal on Children's Lives*, 3(1), 13-19.
- Tomlinson, C. A. (2014). *The Differentiated Classroom: Responding to the Needs of All Learners*. Alexandria, VA: ASCD.
- Vidhi Centre for Legal Policy. (2024). *Early Childhood Inclusion for Children with Disabilities in India: A Mapping Study*. New Delhi: Vidhi Centre.
- Yadav, D. S., & Huddar, D. A. (2025). Strategies for Fostering Inclusive Early Childhood Education for Children with Communication Disorders. *DCIDJ*, 36(2), 70-84.

Acknowledgment

This research is supported by the Indian Council of Social Science Research (ICSSR) Senior Research Fellowship (Project: "Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India"). The author expresses sincere gratitude to Prof. Anjali Pahad, Maharaja Sayajirao University of Baroda, for her invaluable guidance and mentorship. The author also acknowledges the support of the Anganwadi workers, CDPOs, parents, and children who participated in this study.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Gupta, P.K. & Pahad, A. (2026). Designing Inclusive Baalwadis: A Multisensory Early Learning Model for Deaf, Blind, and Neurodiverse Children in India. *International Journal of Social Impact*, 11(3), 121-128. DIP: 18.02.012/20261103, DOI: 10.25215/2455/1103012