



Assessment of Infrastructural Facilities in Pre-Primary Schools of Amritsar District: A Descriptive Survey

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Citation:Dr. Franky Rani, et.al (2024). Assessment of Infrastructural Facilities in Pre-Primary Schools of Amritsar District: A Descriptive Survey, *Educational Administration: Theory and Practice*, 30(10) 2689-2695

Doi: 10.53555/kuey.v30i10.11407

ARTICLE INFO

ABSTRACT

The present study assesses the infrastructural facilities available in pre-primary schools of Amritsar District using a descriptive survey method. A sample of 76 pre-primary schools was selected through random sampling. Data were collected using a structured checklist covering key aspects of infrastructural conditions, including school location and environment, safety and security arrangements, hygiene and sanitation facilities, classroom infrastructure and learning environment, play and outdoor learning spaces, medical and emergency preparedness, nutritional facilities, teacher quality, classroom climate, and child development support. The findings indicate that most schools provide a generally supportive and child-friendly ECCE environment, particularly in terms of hygiene, classroom climate, and teacher quality. However, notable deficiencies were observed in inclusive infrastructure, security measures, emergency preparedness, digital resources, and nutritional services. The study highlights the need for focused infrastructural improvements to ensure safe, inclusive, and quality early childhood education.

INTRODUCTION

Early Childhood Care and Education (ECCE) is globally recognized as the most critical phase for human development. According to UNESCO (2016), ECCE forms the “bedrock of lifelong learning,” influencing children’s cognitive, emotional, physical, and social competencies. UNESCO highlights that children in the age group of 0–8 years experience rapid brain growth, during which learning is powerfully shaped by their environment, including the infrastructural conditions of their early education settings. UNESCO (2016) further emphasizes that high-quality ECCE is inseparable from adequate infrastructure—safe classrooms, proper sanitation, access to clean drinking water, stimulating learning environments, ventilation, and child-friendly play spaces. These components are essential to ensure children’s safety, dignity, and holistic development.

In India, the significance of ECCE is formally recognized in the National Early Childhood Care and Education (ECCE) Policy 2013, which aims to provide equitable and quality early childhood experiences for children aged 0–6 years. The policy highlights infrastructure as a core quality component, stating that ECCE centers must maintain “safe, child-friendly, and developmentally appropriate physical environments” (Ministry of Women and Child Development, 2013). This includes properly ventilated classrooms, clean and separate child-friendly toilets for boys and girls, safe indoor and outdoor spaces, adequate lighting, age-appropriate furniture, and accessible drinking water facilities. The policy stresses that children’s early learning is deeply influenced by their surroundings; therefore, the availability of suitable physical infrastructure is essential for creating stimulating and nurturing experiences.

The National Education Policy (NEP, 2020) builds upon this foundation by introducing a new academic structure—the 5+3+3+4 system, placing strong emphasis on the Foundational Stage, which includes three years of pre-primary education plus Grades 1 and 2. NEP 2020 identifies foundational learning as a national priority, asserting that “over 85% of a child’s cumulative brain development occurs prior to the age of 6” (Ministry of Education, 2020). Consequently, NEP (2020) mandates significant improvements in the physical infrastructure of pre-primary institutions. It recommends upgrading Anganwadi centres with well-designed buildings, safe indoor and outdoor play areas, child-sized furniture, smart teaching materials, and hygienic sanitation facilities. The policy also requires schools to ensure inclusivity and safety, stating that infrastructure must support learning, well-being, and protection. NEP (2020) therefore firmly anchors infrastructural

facilities as a prerequisite for achieving foundational literacy and numeracy, joyful learning, and school readiness.

In alignment with NEP (2020), the National Curriculum Framework for Foundational Stage (NCF-FS 2022) elaborates a comprehensive guiding structure for learning from ages 3–8. NCF-FS (2022) places infrastructural design at the heart of early learning experiences, noting that young children learn best in “safe, secure, comfortable, and aesthetically rich environments.” It provides clear expectations for infrastructure, such as flexible seating, child-friendly toilets, accessible hand washing stations, multiple indoor learning corners (art, pretend play, reading, construction), outdoor play areas with grass and sand, storage for materials, and well-lit, well-ventilated classrooms (NCERT, 2022). The framework also stresses the importance of environmental print, displays at children’s eye level, and freedom of movement—recognizing that the physical layout directly influences exploration, curiosity, creativity, and socio-emotional well-being.

International research further reinforces this connection. Tobin’s IEA Preprimary Project (2005) found that children in well-structured physical environments demonstrated higher socio-emotional and cognitive gains. Similarly, Barnett (2008) and NIEER studies show that classroom design, child-sized furniture, and outdoor learning spaces directly strengthen language, collaboration, and executive functioning. OECD (2017) also identifies infrastructure quality as a core determinant of early learning, noting that overcrowded or poorly designed spaces reduce teacher–child interaction and hinder creativity. Collectively, these global studies emphasize that infrastructure is not merely a support system—it is an active pedagogical factor in early childhood development.

Kaul et al. (2017) found that preschools across India had *major gaps* in learning corners, ventilation, and outdoor play spaces—limitations that directly reduced children’s engagement and exploratory behaviors. NCERT’s national study (2014) similarly reported that only 27% of preschools had adequate learning materials, while many lacked proper sanitation and child-friendly furniture. Regional studies highlight even sharper disparities. Ahluwalia & Kaur (2021), studying Punjab’s preschool environment, found that many institutions lacked outdoor play areas, child-sized toilets, and multisensory materials, leading to lower teacher-reported engagement and increased behavioral concerns. Studies from Andhra Pradesh (Rani & Reddy, 2019) also show that poor infrastructure—unsafe buildings, inadequate flooring, and limited storage—significantly reduces school readiness outcomes. These findings underscore that **the** quality of infrastructure in Indian pre-primary settings varies widely, with direct implications for learning equity.

Thus, the literature clearly shows that the physical environment is a decisive factor in shaping the quality of ECCE. Infrastructure is not simply a background element; it is a fundamental component of pedagogy, shaping exploration, curiosity, creativity, safety, and holistic development.

Importance of the Foundational Stage (Ages 3–8)

The foundational stage (3–8 years) is the period when children build the basic structures of learning. This phase is characterized by rapid growth in language development, motor skills, cognitive abilities, social behaviour, and emotional regulation. According to UNESCO (2016), stimulating and enriching environments during this stage are crucial because early experiences have long-lasting effects on the brain’s architecture. Similarly, NEP (2020) describes the foundational years as the most significant for achieving long-term educational goals, especially foundational literacy and numeracy. Infrastructure plays a life-changing role here:

- Child-friendly classrooms support focus, comfort, and safety.
- Adequate lighting and ventilation promote health and alertness.
- Clean toilets and water facilities support children’s health, attendance, and dignity.
- Outdoor play areas promote physical development and social interaction.
- Safe indoor spaces with diverse materials foster creativity, problem-solving, language development, and exploration.

Without adequate infrastructure, early learning becomes restrictive, unsafe, and ineffective. Poor sanitation, lack of play areas, overcrowded classrooms, and insufficient materials can hinder children’s development, increase absenteeism, and negatively impact learning outcomes (MWCD, 2013).

The National ECCE Policy (2013) stresses the importance of child-friendly spaces, appropriate teaching-learning resources, safe drinking water, and health-related facilities as essential components for early childhood programmes (Ministry of Women and Child Development, 2013). Similarly, the National Education Policy (NEP) 2020 highlights the foundational stage (ages 3–8) as the most critical phase of learning and development and emphasizes quality infrastructure as a precondition for achieving universal foundational literacy and numeracy (Government of India, 2020). UNESCO has long emphasized that quality Early Childhood Care and Education (ECCE) is impossible without safe, inclusive, adequately equipped, and developmentally appropriate learning environments (UNESCO, 2015). In this context, the study aims to explore whether pre-primary institutions in Amritsar provide the foundational physical and pedagogical infrastructure required to support holistic development among young learners. By analysing the availability, condition, and functionality of infrastructure such as classrooms, sanitation, play spaces, safety provisions, and learning materials, the research seeks to assess whether children in the district are being provided environments conducive to their physical, cognitive, emotional, and social development.

In addition, the purpose of this study is to evaluate how well the infrastructural environment in these schools reflects the guidelines suggested by the National Curriculum Framework for the Foundational Stage (NCF-FS) 2022. The NCF-FS emphasizes welcoming, safe, stimulating, and developmentally appropriate learning spaces, recommending features such as flexible seating, outdoor play areas, adequate ventilation, display spaces, and access to diverse play-based learning materials (NCERT, 2022). By comparing actual school environments with these standards, the study seeks to understand how effectively pre-primary schools in Amritsar are positioned to promote experiential learning, exploration, collaboration, and socio-emotional development among young children. This alignment is essential because infrastructure is more than physical space; it shapes children's learning experiences and significantly influences their school readiness.

Given the policy vision of ensuring joyful, inclusive, and developmentally appropriate early learning, it is essential to evaluate whether pre-primary schools in Amritsar meet the infrastructural norms prescribed by national and international guidelines. This includes inspecting classrooms, electricity, seating, play spaces, sanitation, safety measures, digital tools, and TLMs (Teaching Learning Materials).

Finally, the study aims to generate evidence that can inform policymakers, educational planners, school administrators, and local authorities in strengthening ECCE infrastructure in Amritsar District. The findings are expected to highlight existing strengths, identify infrastructural deficiencies, and propose actionable recommendations for improvement. By focusing on the foundational stage—a period globally recognized as vital for lifelong learning—the study hopes to contribute meaningfully to the realization of the goals of NEP 2020 and NCF-FS 2022, and to support the creation of equitable, inclusive, and high-quality early childhood learning environments for every child. The primary purpose of this study is to systematically examine the infrastructural facilities available in pre-primary schools across the Amritsar District, with a focus on evaluating how these facilities align with national and international frameworks for early childhood education.

Method

A general survey design was used in this study. In this study, Pre-primary schools of Amritsar district of Punjab were taken up. Random sampling technique was used to select schools to collect responses regarding various infrastructural facilities being provided in schools. Total 76 schools were selected for study.

Tool

A checklist was prepared by the investigators under the headings: School Location and Environmental Conditions, Safety and Security arrangements, hygiene and sanitation facilities, classroom infrastructure and learning environment, play area & outdoor learning environment, medical & emergency preparedness, nutritional facilities, teacher quality, classroom climate and child development to assess infrastructural facilities provided by the schools.

Findings and interpretation

The following segment presents the findings of the study related to infrastructure, safety, hygiene, classroom facilities, teacher quality, and nutrition in pre-primary schools. The data are presented through percentage distribution and graphical representation, along with brief interpretations to explain the observed trends.

Table 1. Percentage Distribution of Pre-Primary Schools Based on Infrastructure, Safety, Hygiene, Classroom Facilities, Teacher Quality, Nutrition and Interpretation.

	Facilities/Resources		Percentage of schools having facilities/resources	Percentage of schools not having facilities/resources	Interpretation
1.	School Location and Environmental Conditions				
	1.1.	Location of Schools (LoS)	65.8%(urban) 34.2%(rural)	34.2% 65.8%	It indicates urban domination of schools and highlights disparities in infrastructural development across regions.
	1.2.	Peaceful Learning Environment (PLE)	88.2%	11.8%	It shows that most schools have a conducive learning environment, though a small proportion face noise-related challenges that may hinder learning.
2.	Safety and Security Arrangements				
	2.1.	Secure Entrances (SE)	93.3%	6.7%	It shows strong adherence to basic safety norms in most institutions.
	2.2.	Building Condition (BC)	84.2%	15.8%	It indicates that while most schools meet required infrastructure standards, a notable minority still need urgent physical improvements.

	2.3.	Adequacy of Security Measures – Cameras/Guards (AoSM)	77.6%	22.4%	The findings highlight a critical safety concern, as nearly one-fourth of schools lack adequate security despite child safety being a core mandate of NEP 2020.
	2.4.	Emergency Exits and Safety Protocols (EESP)	85.3%	14.7%	It shows that while most schools are prepared for emergencies, the absence of exits and protocols in a notable minority poses potential safety risks.
	2.5.	Availability of Ramps for Children with Disabilities (AoRCwD)	50.7%	49.3%	The near-equal split is concerning, as it reveals that nearly half of the schools do not meet the mandated standards for inclusive, barrier-free infrastructure.
3.	Hygiene and Sanitation Facilities				
	3.1.	Clean Drinking Water (CDW)	96.1%	3.9%	The finding reflects a strong infrastructural provision, with almost all schools ensuring access to clean drinking water.
	3.2.	Sufficient Number of Washrooms (SnoW)	89.5%	10.5%	While most schools meet basic sanitation norms, the lack of adequate washrooms in some schools remains a concern that may affect attendance, particularly among girls.
	3.3.	Soap and Running Water for Handwashing (SRWH)	88.2%	11.8%	Although most schools maintain proper hand-hygiene facilities, the absence of soap and running water in some schools poses risk of infections.
	3.4.	Proper Placement of Trash Bins (PPoTB)	96.1%	3.9%	It confirms proper placement, indicating strong sanitation practices.
	3.5.	Floor Safety (Non-Slippery Surfaces) (FS)	96.1%	3.9%	The findings reflect strong adherence to child safety norms, with safe flooring present in nearly all schools.
4.	Classroom Infrastructure and Learning Environment				
	4.1.	Digital Learning Resources (DLR)	72.4%	27.6%	The results reveal partial integration of digital tools, with a sizable proportion of schools still lacking essential technology.
	4.2.	Classroom Lighting (CL)	93.4%	6.6%	The findings indicate that nearly all schools provide adequate lighting, supporting visual comfort and learning engagement.
	4.3.	Child-Sized Furniture (CSF)	90.8%	9.2%	The data show that most schools provide appropriate child-sized furniture, supporting ergonomic comfort during learning activities.
	4.4.	Learning Materials Availability (LMA)	89.5%	10.5%	The findings indicate strong alignment with NCF-FS 2022, as most schools provide accessible toys, books, and charts that support play-based, multi-sensory learning.
	4.5.	Classroom Layout Supporting Activities (CLSA)	88.2%	11.8	It indicates that most classrooms have layouts that support both individual and group activities, fostering socio-emotional and cognitive development.
	4.6.	Classroom Cleanliness (CC)	82.9%	17.1	It indicates that most schools are clean, though some have maintenance gaps affecting overall satisfaction.
	4.7.	CCTV Installation	69.3%	30.7	It highlights a significant security concern, as most classrooms lack CCTV despite the growing emphasis on child safety monitoring.
	4.8.	Classroom Space (CS)	84.2%	15.8	It shows that most schools provide adequate space for free movement, though overcrowding in some may limit play and exploration.

5.	Play Area & Outdoor Learning Environment				
	5.1.	Maintenance of Outdoor Spaces (MoOS)	89.5%	10.5	It indicates that most schools maintain their gardens and playgrounds well, supporting outdoor activities.
	5.2.	Safety of Play Area (SoPA)	88%	12%	It shows that most outdoor areas are safe and well maintained, though a notable minority pose risks to motor development and socialization.
6.	Medical & Emergency Preparedness				
	6.1.	Emergency Medical Kits Availability (EMKA)	86.5%	13.5%	It indicates that most schools have first-aid kits, though some lack them, posing risks during injuries.
7.	Nutrition Facilities: Mid-Day Meal Programme				
	7.1.	Provision of Mid-Day Meal (PoMDM)	50%	50%	It shows a split response, indicating high inconsistency across institutions.
	7.2.	Quality of Mid-Day Meal (QoMDM)	25% <i>Excellent</i> 27.6% <i>Average</i> 47.4% <i>Not Answerable</i>		It indicates limited MDM implementation, with many schools lacking stakeholder awareness or involvement.
8.	Teacher Quality, Classroom Climate, and Child Development				
	8.1.	Teacher Training and Experience (TTE)	88.2%	11.8%	It indicates strong human resource quality.
	8.2.	Teacher Care and Attention (TCA)	90.8%	9.2%	It shows that most teachers are caring and attentive.
	8.3.	Classroom Management (CM)	92.1%	7.9%	It indicates that most schools maintain effective classroom management, ensuring a safe learning environment.
	8.4.	Professional Communication (PC)	89.5%	10.5%	It shows that teacher communication in most schools is respectful and professional.
	8.5.	Encouragement of Creativity and Play (EoCP)	89.2%	10.8%	It indicates that most teachers foster creativity, aligning with NCF-FS 2022 pedagogy.
	8.6.	Conflict Management Among Children (CMAC)	92.1%	7.9%	It shows that most teachers manage conflicts effectively.
	8.7.	Positive Social Development Observed (PSDO)	89.5%	10.5%	It indicates that most schools emphasize children's social development, reflecting positive ECCE outcomes.

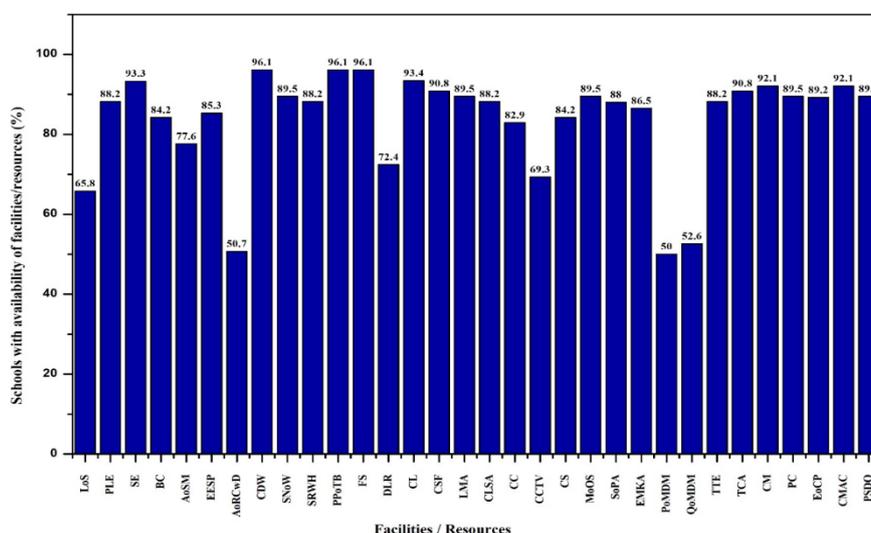


Fig.1. Percentage Availability of Infrastructural Facilities in Surveyed Schools

Discussion

The findings of the present study provide a comprehensive picture of the infrastructural, environmental, and pedagogical conditions of pre-primary schools in Amritsar district, revealing both strengths and critical gaps. The dominance of urban schools in the sample mirrors broader national trends, where urban areas tend to have better access to educational resources and infrastructure than rural regions (ASER, 2022). Although a majority of schools were located in relatively peaceful environments, the presence of noise pollution in a notable minority of schools is concerning, as prior studies have established that excessive noise negatively affects young children's attention span, language development, and early literacy skills (Shield & Dockrell, 2008).

Safety and security provisions emerged as a mixed area of performance. While secure entrances and structurally sound buildings were reported by most schools, significant gaps remain in the availability of CCTV surveillance, security personnel, emergency exits, and disability-friendly infrastructure. These findings resonate with earlier Indian studies highlighting inconsistencies in safety compliance across early childhood institutions, particularly private and semi-private setups (Kaul et al., 2017). The near-equal absence of ramps for children with disabilities directly contradicts the inclusive vision articulated in the National Education Policy (NEP) 2020 and the National Curriculum Framework for the Foundational Stage (NCF-FS) 2022, both of which emphasize universal access and barrier-free learning spaces (Ministry of Education, 2020; NCERT, 2022).

Hygiene and sanitation indicators were among the strongest aspects of the surveyed schools. High availability of clean drinking water, washrooms, handwashing facilities, and non-slippery floors reflects alignment with global ECCE health standards advocated by UNICEF (2019). However, even small gaps in sanitation provisions can have disproportionate effects on young children's health, attendance, and overall well-being, as supported by WHO (2018) findings on water, sanitation, and hygiene (WASH) in schools.

Classroom infrastructure and learning environments showed generally positive trends, particularly in terms of lighting, child-sized furniture, learning materials, and classroom layout. These findings support constructivist and play-based learning theories, which emphasize the role of a stimulating physical environment in fostering cognitive and socio-emotional development (Piaget, 1952; Vygotsky, 1978). Nevertheless, the digital divide observed in nearly one-third of schools lacking smartboards or projectors highlights inequities in early digital exposure—an issue increasingly emphasized in recent educational research (Dong et al., 2020).

Outdoor play areas were largely reported as safe and well maintained, underscoring recognition of the importance of physical activity in early childhood. Yet, the unsafe conditions reported by some schools are alarming, as outdoor play is crucial for motor development, emotional regulation, and peer interaction (Ginsburg, 2007).

Medical preparedness and nutrition services revealed notable inconsistencies. While most schools maintained first-aid kits, the absence of such basic emergency resources in some institutions is problematic. Similarly, the fragmented implementation of the Mid-Day Meal Programme at the pre-primary level reflects policy–practice gaps, echoing earlier evaluations of school nutrition schemes in India (Drèze & Goyal, 2003). Limited stakeholder awareness regarding meal quality further suggests weak monitoring mechanisms.

Finally, teacher quality and classroom climate emerged as a major strength of the ECCE landscape. High levels of teacher training, caring attitudes, effective classroom management, and promotion of creativity align strongly with research emphasizing the central role of teachers in shaping early learning outcomes (Sylva et al., 2004). These findings reinforce the idea that even in contexts with infrastructural limitations, skilled and sensitive teachers can significantly enhance children's developmental trajectories.

Educational and Policy Implications

The findings of this study carry several important implications for policy, administration, and practice in early childhood education. First, the infrastructural gaps related to accessibility, security, and emergency preparedness highlight the urgent need for stricter regulatory oversight and regular audits of ECCE institutions. Policymakers must ensure that NEP 2020 and NCF-FS 2022 guidelines are translated into enforceable standards, particularly regarding inclusive infrastructure and child safety.

Second, the observed digital divide calls for targeted investments in low-resource schools to ensure equitable access to age-appropriate digital learning tools. While technology should not replace play-based learning, guided digital exposure can enhance engagement and early cognitive skills when used judiciously (Dong et al., 2020).

Third, inconsistencies in the provision and monitoring of the Mid-Day Meal Programme suggest the need for clearer policy directives for pre-primary sections, along with capacity-building initiatives to improve awareness among school staff and parents. Strengthening nutrition services at the foundational stage can yield long-term benefits in health, cognition, and school readiness (UNICEF, 2019).

Fourth, the strong performance observed in teacher-related dimensions underscores the importance of continuous professional development. Regular in-service training focused on inclusive practices, child safety, and socio-emotional learning can further enhance classroom effectiveness. Teacher education institutions should integrate these findings into pre-service and in-service training curricula.

Conclusion

The present study provides valuable insights into the infrastructural conditions, safety provisions, learning environments, and human resource quality of pre-primary schools in Amritsar district. Overall, the findings reveal a generally supportive and child-friendly ECCE environment, particularly in terms of hygiene, classroom climate, and teacher quality. However, significant gaps persist in inclusive infrastructure, security arrangements, emergency preparedness, digital resources, and nutrition services.

Addressing these gaps is critical for realizing the vision of equitable, inclusive, and high-quality early childhood education envisioned in NEP 2020 and NCF-FS 2022. A coordinated effort involving policymakers, school administrators, teacher educators, and local authorities is essential to strengthen foundational learning environments. By prioritizing safety, inclusivity, and holistic development, ECCE institutions can lay a strong foundation for lifelong learning and well-being.

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