

Optimizing Inclusive Education through Interior Design: Enhancing Learning Environments for Children with Special Needs in Urban Schools

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Abstract: *According to statistics, the number of children with special needs in India has been steadily increasing. In cities like Rohtak, access to inclusive education remains a challenge, with a significant portion of children with special needs unable to access adequate educational facilities. Recognizing the importance of equity in education, policies promoting inclusion in schools are crucial. Many factors, such as formal and informal education, significantly influence the growth and development of children. In Rohtak, schools can benefit from designing inclusion-friendly environments that accommodate the unique needs of such students. Interior design plays a critical role in creating an adequate learning environment, fostering comfort, engagement, and focus for children with special needs. This study aims to survey children with special needs, their parents, teachers, and peers in Rohtak to gather insights into school design planning. Using interactive and non-interactive qualitative methods, such as literature reviews, interviews, observations, and visits to inclusive school setups, the survey will involve at least 40 respondents. The ultimate goal is to develop actionable suggestions for schools in Rohtak to improve their inclusivity and provide children with special needs the opportunity to maximize their potential in an environment tailored to their requirements.*

Keywords: inclusive education, children with special needs, school design planning, interior design for learning, inclusive school environment

1. Introduction

Children with special needs in Rohtak face unique challenges in education, social inclusion, counseling, and access to specialized services. According to government regulations, children under 18 experiencing physical, mental, intellectual, sensory, or emotional challenges that significantly impact their growth and development are classified as children with special needs. These conditions often hinder their ability to participate effectively in society. With proper intervention and support, however, they can become independent and valuable contributors to their communities.

In Rohtak, access to education and services for children with special needs varies significantly, especially in rural versus urban areas. Despite laws mandating equitable education and public service access, gaps persist. Recent studies have revealed that children with disabilities often face lower secondary education completion rates, with fewer than 8% pursuing higher education in semi-urban settings. Additionally, societal acceptance and employment opportunities remain scarce, with employment rates for individuals with disabilities stagnating at below 45% nationally. Locally, this is further compounded by insufficient public infrastructure and limited awareness about inclusive education. The lack of inclusive facilities in schools and limited public awareness about accessibility exacerbate the problem. Although the Haryana government has introduced programs to promote inclusive education and mandated accessible facilities in schools, implementation remains

inconsistent in Rohtak. Initiatives like special education training for teachers or the development of inclusive infrastructure are often underutilized due to resource constraints and administrative inefficiencies.

While several studies have examined the barriers to education for children with special needs at the national level (e.g., Singhal & Reddy, 2020; Gupta & Kaur, 2021), there is limited research focused on smaller urban centers like Rohtak. Most research concentrates on metropolitan cities like Delhi or Bengaluru, leaving a significant knowledge gap regarding the challenges faced by children with special needs in semi-urban and rural settings (Sharma, 2018). Additionally, there is a lack of data on the effectiveness of state-level policies like those implemented in Haryana. Studies rarely explore how cultural and societal factors unique to regions like Rohtak influence the adoption of inclusive education practices.

2. Methodology

To understand the challenges and opportunities for children with special needs in Rohtak, a combination of interactive and non-interactive qualitative data collection methods will be employed. These include a literature review focusing on behavioral characteristics related to the environment, interviews with stakeholders (such as parents, teachers, and policymakers), observations of inclusive educational settings, and visits to schools and community centers in various parts of Rohtak, including urban and rural areas.

Age Group	Communication Issues	Social Interaction	Emotional Regulation	Learning Difficulties	Motor Skills Challenges	Attention/Focus Issues
0-5 years	10	7	8	6	4	5
6-10 years	8	9	7	10	5	6
11-15 years	5	4	6	8	4	9
16-18 years	4	3	2	4	3	2

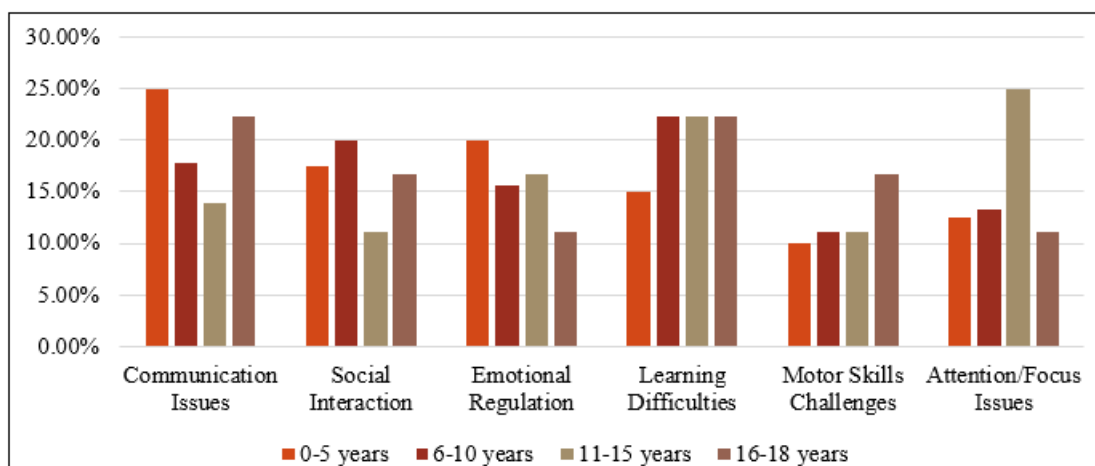


Figure 1: Behavioural Mapping of Children with special need by age group

Source: Author

The data reveals key behavioral challenges across different age groups of children with special needs in Rohtak. In the 0-5 years age group, communication issues are most prevalent, followed by social interaction and emotional regulation difficulties. As children progress to the 6-10 years age group, learning difficulties become more prominent, while social interaction remains a concern. For the 11-15 years group, attention/focus issues increase, alongside ongoing challenges in emotional regulation and learning. By the 16-18 years age group, most behavioral challenges decline, though attention/focus issues remain significant. This suggests that while younger children face more severe challenges, improvements are seen with age, particularly in communication and social interaction. However, attention and focus difficulties persist across all age groups.

Discourse analysis will serve as the analytical framework for examining children's reactions and behaviors within their educational and social environments. This interdisciplinary approach enables a nuanced exploration of diverse perspectives, uncovering how environmental factors, such as school infrastructure and community attitudes, influence learning performance. By analyzing the interactions between children's behaviors and their surroundings, the study aims to generate insights, critiques, and actionable conclusions that can drive meaningful social and educational reforms (Jorgensen & Phillips, 2002, p. 3).

This methodology provides a comprehensive understanding of the systemic and local challenges faced by children with special needs in Rohtak, offering valuable recommendations to improve inclusivity and equity in education. By tailoring solutions to the specific cultural and structural context of Rohtak, the study aspires to foster a more supportive and enabling environment for children with special needs.

3. Finding and Discussion

Children with Special Needs

According to Indian laws and policies, children under the age of 18, including those with disabilities, are entitled to special protections and services to support their growth and development. Children with disabilities often face physical, emotional, mental, intellectual, and social challenges that significantly impact their ability to engage with society compared to their peers. These disabilities are commonly categorized into three types: physical disorders, emotional and mental disorders, and intellectual disorders (Desiningrum, 2016, p. 7).

In Rohtak, children aged 6 to 18 represent a growing segment of individuals with disabilities. The city exhibits disparities in access to healthcare, education, and support systems, particularly between urban and rural areas. While some schools in Rohtak have initiated efforts toward inclusivity, such as providing resource rooms or employing special educators, many children with disabilities still face barriers to accessing adequate education and support services. Additionally, limited awareness and infrastructure gaps exacerbate the challenges in ensuring equitable access to opportunities.

This study will focus on key areas in Rohtak to better understand the challenges faced by children with disabilities and the resources available to them. By analyzing the local environment, educational facilities, and community responses, the research aims to provide actionable recommendations to improve the inclusivity and effectiveness of support systems for children with disabilities in the region. Tailored solutions will help bridge the existing gaps and create a more equitable and supportive environment for all children in Rohtak.

Type of Education for Children with Special Needs

Rohtak has gradually evolved its approach to providing education for children with special needs, reflecting a mix of traditional and modern practices to address their unique requirements. Initially, special education in the city was separate from mainstream schooling, based on concerns about integrating children with special needs into regular classrooms. This led to a segregated system, which can be categorized as follows:

1) Segregation Education

a) Special Schools for Disabilities

Rohtak's special schools cater to children with specific disabilities, functioning as standalone institutions managed under unified administrations. These schools are typically specialized by need, focusing on areas such as visual impairments, hearing disabilities, intellectual challenges, physical disabilities, or behavioral issues. While Rohtak has fewer such facilities compared to major cities, institutions like the Haryana Welfare Society for Persons with Speech and Hearing Impairment (HWSPSHI) serve as important examples of specialized care and education.

b) Special Schools with Boarding Facilities

Some schools in Rohtak offer residential facilities, enabling children from rural or underserved areas to access consistent care and education. These institutions not only provide academic support but also holistic development, integrating educational, recreational, and therapeutic services within a residential setting. Such schools are essential for children who lack access to daily transportation or live far from educational facilities.

c) Outreach/Visiting Programs

For children in remote or underserved areas of Rohtak, outreach and visiting programs have been introduced, often in partnership with NGOs and local government initiatives. These programs provide educational resources and therapies to children who are unable to attend specialized schools, ensuring they are not left behind due to geographic or economic constraints.

d) Stage-Specific Special Schools

Over time, Rohtak has seen the development of stage-specific institutions catering to children at various levels, from early childhood to primary and secondary education. These schools aim to provide structured programs aligned with mainstream curricula while accommodating the needs of children with diverse disabilities. However, the availability of such stage-specific facilities remains limited, highlighting the need for further expansion and resource allocation.

While these systems mark significant progress, the availability of resources and access to special schools in Rohtak remains uneven. Many families rely on government schools, which often lack adequate infrastructure, trained staff, and inclusive practices to support children with special needs. Expanding these services, enhancing teacher training, and integrating inclusive education models into mainstream schools are critical to ensuring that every child in Rohtak has access to quality education tailored to their needs.

By fostering a balance between specialized and inclusive education, Rohtak can create a more equitable and supportive environment for children with special needs, enabling them to thrive both academically and socially.

2) Inclusive Education

In Rohtak, inclusive education is gaining momentum as an approach to ensure equitable learning opportunities for children with special needs. This model is rooted in the principle of inclusion, emphasizing that educational institutions should adapt their structures, curricula, and teaching methodologies to address the diverse needs of all students.

The curriculum in inclusive schools in Rohtak is increasingly adopting a student-centered approach, guided by teachers using methods that focus on individual needs and abilities. Inclusive education offers several advantages over traditional segregated systems, such as:

- Raising Awareness:** Promoting the importance of inclusive education helps reduce societal stigmas and discriminatory attitudes toward children with disabilities. It fosters a culture of acceptance and understanding in communities across Rohtak.
- Community Involvement:** Inclusive education encourages collaboration among parents, teachers, local NGOs, and community members to analyze the educational landscape of Rohtak and identify specific challenges faced by children with special needs.
- Addressing Barriers:** The approach focuses on identifying and addressing barriers to learning and accessibility, whether physical (such as inadequate infrastructure), social (such as attitudes and stigmas), or related to disabilities.

Efforts in Rohtak, such as the initiatives led by the Haryana Welfare Society for Persons with Speech and Hearing Impairment (HWSPSHI) and government-run programs, are examples of the shift toward inclusive education. Some schools are beginning to integrate children with special needs into mainstream classrooms, supported by resource rooms, trained educators, and assistive technologies to ensure an inclusive environment.

While the journey toward full implementation of inclusive education in Rohtak is ongoing, these efforts represent a significant step forward. Inclusive education is paving the way for a more equitable and accessible system, reinforcing the belief that every child, regardless of ability, deserves the opportunity to learn and thrive alongside their peers.

School Curriculum

In Rohtak, inclusive schools are beginning to adopt what is commonly referred to as an adaptive curriculum, a flexible modification of the standard curriculum. This approach ensures that children with special needs receive a meaningful and effective education alongside their peers by accommodating their unique needs and developmental stages. The development and implementation of an adaptive curriculum in inclusive schools in Rohtak typically involve four key steps:

- a) **Assessment of Student Needs:** Teachers and special educators assess the abilities, learning styles, and developmental stages of each student. Schools in Rohtak, such as those affiliated with the Haryana Welfare Society for Persons with Speech and Hearing Impairment (HWSPSHI), conduct detailed evaluations to understand the specific requirements of their students.
- b) **Curriculum Modification:** The standard curriculum is tailored to meet the diverse needs of students. Modifications may include simplifying content, integrating assistive technologies, or employing alternative teaching methods such as visual aids, interactive tools, and tactile learning materials to enhance understanding and engagement.
- c) **Implementation with Individualized Support:** The adaptive curriculum is delivered through personalized teaching strategies, such as one-on-one sessions, small group activities, or specialized learning aids. Inclusive schools in Rohtak focus on creating environments where
- children with and without special needs can learn together, supported by trained educators and resource rooms.
- d) **Continuous Monitoring and Revision:** Regular assessments and feedback loops are conducted to evaluate student progress. Based on these evaluations, further modifications are made to ensure that the curriculum remains responsive to their evolving needs and developmental milestones.

This adaptive approach ensures that children with special needs in Rohtak's inclusive schools receive a well-rounded education tailored to their abilities. It also fosters an environment of acceptance, integration, and equal opportunity, contributing to a more inclusive and supportive community for all children.

Table 1: Stages of Modified Curriculum for Special-Needs Children.

Duplication	Develop and implement a curriculum for students with disabilities in a manner similar to that utilized for general education students.
Modification	Students follow a curriculum that is tailored to their unique circumstances, requirements, and talents. The applied curriculum is slightly different from the standard curriculum.
Substitution	Substituting something in the general curriculum for one that is inaccessible to special-needs children and can be replaced with something of similar weight.
Omission	Removing or deleting anything from the general curriculum, either partially or totally, since it is impossible to provide it to children with more severe disabilities.

Source: Rudiyati, n.d., pp. 9–20

Types of Therapy for Children with Special Needs

In Rohtak, various forms of therapy have emerged as crucial support systems for children with special needs. These therapies aim to enhance communication skills, improve social interactions, address behavioral challenges, and develop academic and life skills. Common therapies include speech therapy, occupational therapy, behavioral therapy, and physical therapy, each tailored to address the specific needs of children with disabilities.

Interviews conducted with teachers, therapists, psychologists, and parents in Rohtak reveal the positive impact of these therapeutic interventions. Respondents have reported significant improvements in children's communication, social engagement, learning performance, motor skills, and overall behavior after undergoing therapy. Institutions such as the

Haryana Welfare Society for Persons with Speech and Hearing Impairment (HWSPSHI) play a pivotal role in providing these services.

However, access to therapy services in Rohtak remains uneven, particularly in rural areas where awareness and infrastructure are limited. This highlights the need for expanding therapeutic facilities and programs to ensure equitable access for all children. Raising awareness among parents and educators about the benefits of therapy is equally important for increasing utilization.

The findings emphasize the critical role of accessible, well-structured, and community-supported therapeutic services in improving the quality of life and fostering social inclusion for children with special needs in Rohtak.

Table 2: Therapy for Children with Special Needs

Therapy	Scope of Focus	Description
Occupational	Motoric Disorders	Healing efforts are made possible by providing specific physical, intellectual, social, emotional, and creative activities that promote the child's independence. The objective is for youngsters to be self-independent in carrying out daily activities. Materials and approaches are chosen based on the child's traits. The therapy exercises include reaction exercises such as calling names, movement habits such as walking in a straight line, gross motor skills such as walking freely without assistance, balance exercises such as slowly walking on a titan board, and fine motor skills such as opening a bottle cap.
Physiotherapy	Physical Limitations	The objective is to strengthen and train the motion function. It is classified into two types: passive (movements are performed with the assistance of the therapist) and active (movements are performed with the child's efforts). Physical rehabilitation exercises include swimming, walking, climbing, twisting, etc.
Applied Behavior Analysis (ABA)	Emotional, Behavior, and Intellectual Disorder	Giving positive reinforcement if the child follows the instructions correctly and withholding reinforcement when the youngster follows the instructions incorrectly or does not respond at all. The fundamental concept is denoted by the acronym A-B-C, which stands for Antecedent (things that occur before the occurrence of the behavior, specifically instructions), Behavior

		(i.e., behavior/response/ response to instructions), and Consequence (positive rewards). The objective is to promote comprehension and compliance.
Sensory Integrity	Autistic Spectrum Disorder	The therapist will direct activities that gradually stimulate (challenge) the child, and the youngster is supposed to respond positively / improve their response. This therapy aims to alleviate autism symptoms and tantrums to enhance children's ability to handle various complex sensory information encountered in daily life.
Play	Motoric and Sensory Disorder	Playing can help children develop their physical, intellectual, emotional, and social abilities. For instance, motor activities involving plasticine, role-playing doctors, and so forth. Developing imagination, creativity, and expression, as well as the self confidence and ability to solve difficulties. Sensory-motoric activities include walking on a rope, kicking a ball, erecting block towers, and finger-painting symbols. Therapy for communication and socializing like playing with sand.
Speech / Talk	Behavioural and Emotional Disorders	This therapy is also appropriate for people who have high speech skills but are unable to use them for communication/interaction with others and those who have significantly compromised nonverbal or linguistic abilities. Massage is also used in this therapy to relax the muscles surrounding the mouth.
Development	All Disorders	Floor time, Son-Rise, and Relationship Development Intervention are the three types of developmental treatment. Children's interests, strengths, and growth will be examined, and their social, emotional, and intellectual abilities will be sharpened further. This therapy is more widespread.
Visual	Visual Learner / Visual Thinker	Learning and communication methods such as photos, video games, and picture cards can be used to develop abilities. PECS (Picture Exchange Communication System) is a specific system that is currently simple and frequently utilized by regular children.
Snorezen	Mental Disorder	This therapy is intended to relax the child while allowing him to explore and express himself through primary sensory stimulation (sight, hearing, touch, taste, tongue, smell, and internal sensors). As a method of mental relaxation for children, as a medium for playing (leisure environment), and as a form of treatment, children are oriented to one activity, delivering a variety of sensory stimuli. Achievable objectives include: Children can enjoy games, activities, or themselves, relax psychologically and physically, raise their awareness, take the initiative to participate in activities, increase self-confidence, and improve social interactions.
Music	Emotional and Behavioral Disorders (Especially very reserved, aloof, or retarded)	According to numerous studies, music may be utilized as an educational tool since it can build an artistic sense of initiative, which can influence psychomotor and psychometric development and growth. The purpose is to build and strengthen physical ability, train perception, develop potential, and regulate emotions. Music therapy encompasses moving the body in response to music, listening to music, using instruments, singing, and playing in response to music.
Brain Exercise	Mild Emotional, Behavioral and Intellectual Disorder	This therapy is at the center of educational kinesiology (the science of human movement), which uses touch and simple pleasant movements to connect all sections of the brain in order to increase skills, cognitive abilities, learning, self-esteem, and togetherness.

Source: Desiningrum, 2016, Chapter 6; Relaksasi Saat Pandemi, 2021, p. 1; Rudiyati, n.d.

Inclusive School Facilities

Parameters for Designing Inclusive School Structures in Rohtak

Access:

- Simple and clear layouts, easy to navigate for all users.
- Sufficient space for wheelchairs and walking aids.
- Escape routes designed with disabled individuals in mind.
- Doors at least 90 cm wide with easy-to-use handles; avoid sliding or heavy doors.

Space:

- Clear areas around furniture for wheelchair users.
- Proper storage for heavy equipment and diverse learning materials.
- Safe vehicle movement within school premises, especially in special schools.

Sensory Awareness:

- Use anti-glare lighting and maintain good acoustics.
- Incorporate visual contrasts and textures for sensory navigation.
- Avoid overstimulating environments by reducing negative stimuli.

- Use flooring materials with low heat conductivity (avoid cold-feeling materials like marble).
- Include interactive decorations for passive engagement and therapy.

Flexibility:

- Spaces should be adaptable for different uses over time.
- Enable adjustments to lighting and acoustics for varied learning needs.
- Avoid fixed furniture in classrooms to allow rearrangements for activities.

Well-Being:

- Ensure thermal comfort and good ventilation with adequate oxygen.
- Control background noise to minimize distractions.
- Include medical and therapy facilities suited to special needs.
- Maintain cleanliness to support children with lower immunity.

Safety and Security:

- Provide clear sightlines for supervision to monitor risky activities or behavior.
- Use strong materials with padding to handle tantrums or behavioral outbursts.

These design principles can help create inclusive and supportive environments for children with special needs in schools across Rohtak.

The classroom and therapy room are the two most significant inclusive school rooms. However, such rooms cannot be created in the same way as a conventional school; here are some important things to consider when designing:

4. Conclusion

In Rohtak, children with special needs often face challenges of neglect and exclusion, which can significantly hinder their development and growth. Recognizing these barriers, the Indian government has implemented various policies aimed at promoting inclusivity in education and public spaces, including ensuring accessible and inclusive designs in school buildings.

In Rohtak, as in other areas, the design of educational spaces goes beyond just the external structure of school buildings.

Interior design plays a vital role in supporting the learning performance and well-being of children with special needs. Factors such as accessibility, space, sensory awareness, flexibility, safety, and security must be carefully considered when designing school environments. These considerations are crucial as the needs of children with special needs are often very different from those of children in conventional schools.

Inclusive interior designs in Rohtak can create supportive, functional, and welcoming spaces that enhance the educational experience for children with special needs. Properly designed environments can foster a sense of belonging and contribute to the holistic development of these children, allowing them to thrive academically, socially, and emotionally.

Table 3

Room	Key Furniture	Recommendation
Classroom	Student's table and chair, whiteboard / chalkboard, teacher's table, and chair.	a) Typically, primary school classrooms utilize educational decorations glued on the walls; however, to avoid damaging the walls, it is preferable to set a proper place to attach the decorations for learning. But too crowded decorations can interfere with a child's concentration, especially for those with learning difficulties. b) Later in grade 6 elementary school, there will be tests that need the classroom to be free of distracting decorations that might lead to cheating, so for children to get adjusted to it, the higher the class level, the fewer decorations. c) Sharp corners are not suggested because when kids experience tantrums, they may not have full control of their body and environment, making sharp corners dangerous. d) Personal storage space, preferably near their chair and table, because their stuff may appear jumbled without it, which might encourage undesirable habits. e) The classroom must have at least one clear side so that the activity within may be seen from the outside. f) At the very least, the distance between furniture, particularly between seats, is wheelchair accessible.
Therapy	Therapy Room Equipment according to therapy type	a) Most therapies are more effective when performed one on one, hence smaller rooms with suitable facilities are essential. b) Because some children perceive therapy as a punishment, the entire therapy room design must promote happiness and joy.
Service Area (Toilet, Staff Room, Kitchen, etc.)	Depends on the room, i.e., kitchen set for kitchen	Rooms containing sharp objects, such as the kitchen and storage room, must be kept out of reach of children without adult supervision.

Source: Designing for Disabled, 2014, pp. 15–16

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