



Designing for Children

- With focus on 'Play + Learn'

Designing an inclusive playground for primary schools

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Abstract: The paper outlines the need and the process of designing an inclusive playground for children with disabilities. It also points out the impact on the emotional development in children by introducing inclusion as a topic in primary education system through play. Mapping of Indian school systems and the overall student development was done to select the area of intervention and to form the design brief. As a primary study, physiotherapists and students having visual impairment, mobility disability, autism, etc. were interviewed to carry an ethnographic research to understand their daily activities, respective needs and the obstructions faced by them in the play area. Secondary study involved going through literature and existing solutions abroad. The takeaway from these studies were compiled to conceptualize a solution for a 3,000 sq feet play space taking one of the kendriya vidyalaya school as reference.

Key words: *Inclusive playground, Universal design, Accessibility, Inclusion.*

1. Background Study

The Right of Children to Free & Compulsory Education (RTE) Act, 2009 had come into force w.e.f. 1st April, 2010. The RTE Act provides for free & compulsory education to children in the age group of 6-14 years at elementary level in a neighborhood school. Government of India had since aligned the Sarva Shiksha Abhiyan (SSA) norms with the provisions of Right of Children to Free and Compulsory Education Act, 2009.

SSA ensures that every child with special needs, irrespective of the kind, category and degree of disability, is provided meaningful and quality education. Hence, SSA has adopted a zero rejection policy. This means that no child having special needs should be deprived of the right to education and taught in an environment, which is best suited to his/her learning needs.

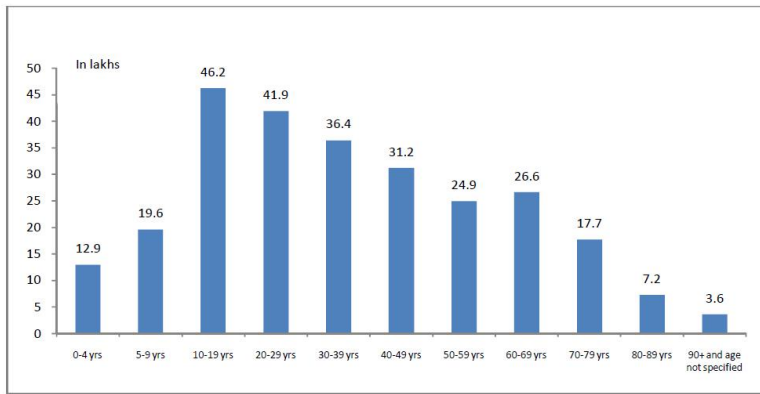


Figure 1. Disabled population by age groups in India - Census,2011

Differing combinations of structural factors (such as caste, gender, religion, poverty etc.) intersect with disability resulting in varied individual experiences, but the broad commonalities that shape the lives of people with disabilities in India transcend these divisions. Adding to disability the children’s lives are largely marked by poverty and marginalization from mainstream social processes. A study by the World Bank, noted that children with disabilities are five times more likely to be out of school than children belonging to scheduled castes or scheduled tribes (Alur M., 2007). Moreover, when children with disability do attend school they rarely progress beyond the primary level, leading ultimately to lower employment chances and long-term income poverty. Statistics show very low portion of disabled students taking admission in public and government schools which points out to the lack of facilities these school provides in terms of accessibility and inclusiveness. A special education student is first and foremost a general education student. Kids who receive special education services should learn in what’s called the “least restrictive environment”. That means they should spend as much time as possible with students who don’t receive special education services (Bost, 2015).

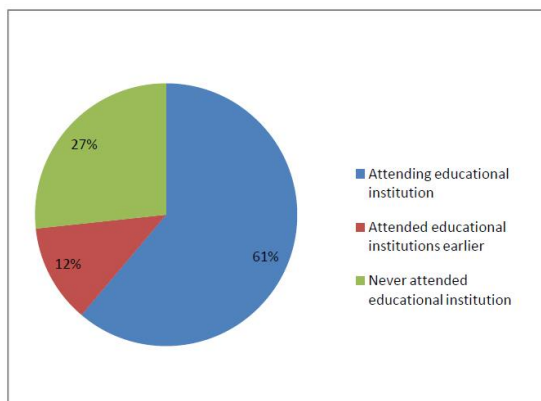


Figure 2. Status of school attendance of disabled population 5-18 yrs in India (in %) - Census,2011

2. What is Universal Design?

The term "universal design" was coined by the architect Ronald Mace to describe the concept of designing all products and the built environment that along with being aesthetic are usable to the greatest extent possible by everyone, regardless of their age, ability, or status in life. However, it was the work of Selwyn Goldsmith, author of *Designing for the Disabled* (1963), who really pioneered the concept of free access for people with disabilities. Accessibility is a general term used to describe the degree to which a product, device, service, or environment is accessible by as many people as possible. While inclusion is the practice of ensuring that people feel they belong, are engaged, and connected. Universal design is an approach to designing products, services and systems that work for all. They should be usable and effective for everyone, not just people with disabilities, without the need for adaptation or specialized design. Few simple examples include for instance a ramp that provides access to someone on wheelchair to enter a building, or instructions that present material both orally and visually, etc.

3. Design Process and Methodology

3.1 Discovery

Initially a study was done to list all different types of schooling prevalent in India namely public schools (Central, state and local), private schools, international schools, homeschooling, special needs school, etc. Kendriya Vidyalaya(KV) was taken up as the base reference for study and implementation of the idea among all others. The Kendriya Vidyalaya Sangathan is a system of central government schools in India that are instituted under the aegis of the Ministry of Human Resource Development (MHRD). There are a total of 1209 schools in India (as of July 2019) and three abroad and hence makes it one of the world's largest chains of schools. KVs show cultural diversity with students from different state and economic background. They all share a common syllabus and offer bilingual instruction, in English and Hindi and are co-educational. In terms of infrastructure most of the KVs have big campuses and are mostly located in defense localities. As per the reservation policy of the Kendriya Vidyalaya Sangathan, a total of 3% seats are already reserved across the board for physically challenged children - the visually, the orthopedically and the aurally impaired. Horizontal reservation means that 3% of 15% is reserved for handicapped children of SC, 3% of 7.5% is reserved for handicapped children of ST and 3% of 77.5% is reserved for the physically challenged children of the General Categories. The human resource development ministry also exempts differently abled students from tuition fees at Kendriya Vidyalayas across India covering students with any disability listed in the Persons with Disabilities (Equal opportunities) Act.

Under the Inclusive Education for Disabled at Secondary Stage (IEDSS) component of the integrated Rashtriya Madhyamik Shiksha Abhiyan development of accessible physical environment in existing secondary school buildings. Out of all Kendriya Vidyalayas running in the country, 93.39 per cent of them have ramps and 97.44 per cent have special toilets. Kendriya Vidyalaya Sangathan (KVS) has also taken a policy decision to provide special toilets and ramps to disabled children, teachers and staff in all the new KV buildings, which will be constructed by KVS in future. Providing support through assistive devices and the availability of trained teachers along with modifying the existing physical infrastructure and teaching methodologies to meet the needs of all children including Children with Special Needs is all part of the IEDSSS policy. One can argue the actual practical implementation of these policies which subjectively vary across schools in the country. Though one can understand that inclusive classroom and teaching have developed over a period of time and being talked about but playground is an area where design intervention is required significantly. Playgrounds of few Kendriya Vidyalay were examined to note all play activities and the existing accessibility barriers.



Figure 3. Playground in Kendriya Vidyalay, IISc Bangalore Campus

For developing children, play is learning. Children learn to solve problems, make decisions, persevere, and interact with the people and objects in the environment. They develop language, symbolic thinking, social skills, and motor skills (Athey, 1984; Florey, 1971; Whaley, 1990). Physical play has many positive outcomes. Many studies show the benefits of physical activity for children. They are healthier, have higher self-esteem and are better prepared to learn. Playgrounds are an ideal environment for supporting overall healthy development. It is known that play is an important process in the physical, social and cognitive development of a child; every child should be encouraged to be a part of it. Absence of inclusive playground for children with disabilities in primary schools not only discriminates but also leads to their poor physical, social and cognitive development. Children with disabilities are at a higher risk of social isolation. Studies have found that

these children are excluded from play significantly more often than their peers without disabilities.

3.2 Defining

An inclusive solution in the play area would not only help in the physical, social, and cognitive developments but also sensitize children to the topic of disabilities and enhance their emotional development as they play together by building empathy and compassion. As stated by many studies, primary education is a crucial stage in the overall development of a child and the learning is further carried into adulthood. Primary school becomes the agency that first organizes social relationships, and classroom becomes the place where children learn to socialize with their peers without the presence of their parents. The purpose of primary education is that it assists a child in many areas of life. It is instrumental in shaping a child’s personality and the way he/she deals with situations of life. Through a shift of teaching through text books to a more practical learning through play activities in schools can bring a better impact. Through inclusive play the kids will discover a common ground of interaction and bonding which will go a long way in reducing stigma in the society.

Disability in	Grades		
	I-V	VI-VIII	I-VIII
Seeing	20.79	32.87	24.02
Hearing	11.69	11.04	11.52
Speech	13.04	8.28	11.77
Moving	27.28	32.09	28.56
Mentally Retarded	19.68	8.62	16.73
Others	7.51	7.10	7.40
% to total enrolment	0.79	0.80	0.80

Figure 4. Enrollment according to type of disability, DISE, 2009

Active play is just as important, perhaps more for children with disabilities. Children with disabilities are at higher risk of social isolation. Studies have found that children with disabilities are excluded from play significantly more often than their peers without disabilities (Wolfberg et al., 1999). Studies also show that peer interaction between people with and without disabilities is enhanced when there are opportunities to interact with peers without disabilities (Guralnick, et. al., 2007). The study found that children are more likely to choose a child with a physical disability to join a play activity when the disability interferes minimally with participation. This finding suggests that children’s inclusion decisions may be influenced by the demands of the play setting. In other words,

children will engage in play with children with disabilities if they can engage in activities together without significant changes to the play environment.



Figure 5. Children with disabilities indulging in leisure activities

A qualitative research was carried out by interviewing students with disabilities and their families to get to know their daily activities within school and outside, to understand what play and recreational activities they engage themselves in and what are their needs and requirements with regards to play space. Students were considered in each of the categories viz. visually impaired, blind, paraplegic and autistic. It was noted that these children experience less diversity of activities and less social engagements than their peers without disabilities, spending more time in isolated activities such as watching television and using the computer. These children carried out leisure activities mostly on their own or with parents rather than with friends. Among the children interviewed, Suraj, 8yr old born with Spina bifida, uses crutches to walk and spends his leisure time playing on his father's mobile phone and at times plays board games with his cousins. Gauri, 11yr old having cataract in both eyes is visually impaired with limited vision likes to play harmonium and bongo. Parents accompany their children for outdoor strolls in the park from time to time but never encourage them to play by themselves on swings as it concerns them. When play with peers is limited, the ability to learn and develop the skills and attitudes of accomplishment associated with play are also restricted. As seen by the data small number of people with a disability deal with mobility issues, the rest majorly count for cognitive or sensory disabilities, and some are on the autism spectrum. For these children, ramp access to a playground or basic ground-level equipment are probably not going to make much of a difference, because initial entry and the height of play elements weren't the obstacles in the first place. Sensory play is particularly important for children on the autism spectrum, who often have issues with sensory processing. This means that they feel either over-stimulated or under-stimulated by their senses and as a result shun or seek out certain sensations. Anshul, 10 yr old with autism becomes over-stimulated by loud noises and feels the impulsive need to retreat from all the commotion. An inclusive playground may anticipate such a need through supplying cozy, quiet spaces to escape to. Activities with

music or certain tactile physical experiences also provide sensations these children crave. The space should consider the users of wheelchairs and crutches to make both play equipments and way to them reach them accessible. These needs were noted before proceeding to ideation phase.

3.3 Development

Based on findings and insights from qualitative research, ideas were sketched centered around a gender-neutral theme of 'space exploration'. An area of approximately 3000 sq. feet was taken based on the existing layout of KV IISc Bangalore campus as reference for implementation of the concept. Activities like grasping, swinging, sliding, climbing, balancing, etc. were included in the concepts that would help develop motor skills, balance and coordination. Modifications were sought in contemporary play equipments and swings to make them accessible and safer. Straps were given on seats of swings along with making the seats ergonomically comfortable. Indian anthropometric data for designing school furniture by Central Building Research Institute was referred (V.K. Agarwal, 1990). For the complex elevated structures horizontal bars were avoided and made inaccessible by placing them at a higher level to avoid climbing on them and guard rails were provided throughout the structure to avoid falling.



Figure 6. Modifications in play equipments to make them accessible

Merry go-round was brought to a surface level for giving access to wheelchair. Ramps with 1:12 slope and transfer platforms were provided for the complex play structure with handrails for children to use them as support while moving.



Figure 7. Provision of ramps, transfer platform and leveling of equipments

Sensory play elements were added like tactile games and musical instruments. These elements were also provided at an accessible height for wheelchair users.



Figure 8. Tactile and musical elements for multi sensory experience in play

Free play areas were considered as well in order to provide a platform for socializing and organized games for children to encourage communication and interaction with each other. A meteor shaped dome inspired by the theme was conceptualized for the same and at the same time to serve someone with autism to find a calm temporary escape when he/she is disturbed by noise and commotion.



Figure 9. Meteor shaped dome inspired by theme

Surfacing was reckoned to be an important component in designing safe accessible play spaces. The existing playgrounds have been built with non-accessible surfacing materials (pea gravel and sand), excluding those with mobility challenges. Selective use of rubber surfacing can maximize access to particular play equipments.



Figure 10. Playground concept (Perspective View)

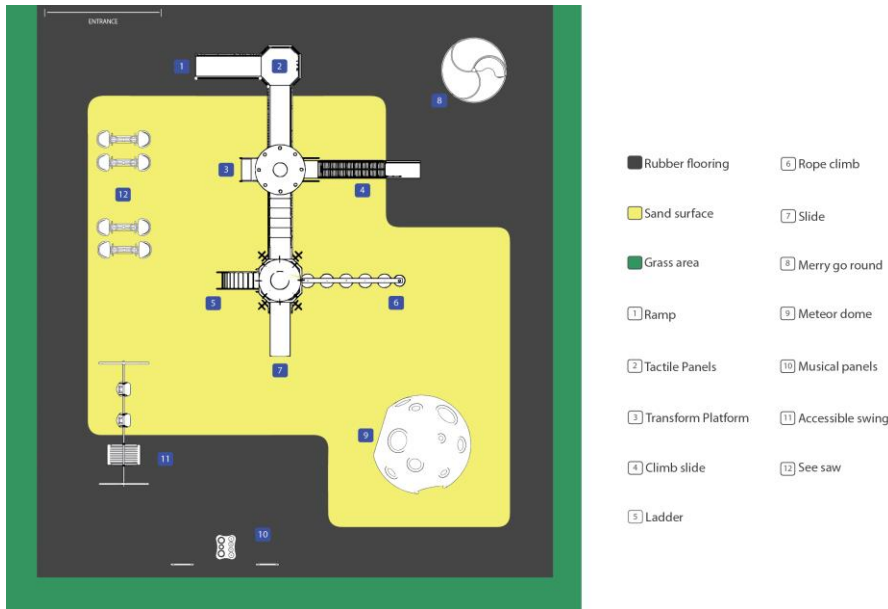


Figure 11. Layout of the playground (Plan View)

4. Project Takeaways

Integration should be of utmost importance in an inclusive space. One should not put a special equipment in a separate area off to the side, but rather the space must be designed with a cohesive approach where play opportunities are integrated throughout. That is the very idea of an inclusive playground. The wheelchair accessible swing was placed in close proximity to other swings. The idea is that such a layout increases the chances that the children will become familiar with each other, fostering compassion and empathy.

A playground must also provide a perception of challenge along with being safe at the same time. Multiple levels of challenge can be incorporated into playground weather inclusive or otherwise by giving children the perception of risk, the activity not being dangerous in reality. Incorporating rocket and spaceship structures will encourage imagined adventure and at the same time covering the play space with ground surfacing that has enough to protect a child from a falling injury.

5. Conclusion

The paper sheds light on the lack of policies and provisions in the play area that eventually lead to exclusion of children with disabilities resulting in their poor physical, social and cognitive development. It talks about how an inclusive playground can benefit children of all kinds of abilities by making activities more safer and also help build empathy that can eradicate the stigma surrounding disability. The solution will help facilitate the retention

of such children in the school system. It points out the basic barriers to accessibility in the playground and ways used to curb the same. The takeaways from the project highlight areas one must take into consideration while designing and exemplifies ideas that need to be reflected in the space. The research insights generated in the project through direct observation and contextual study will help one develop similar projects in future. The same can even be applied to areas outside school like public parks for instance.

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