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UNIVERSAL DESIGN FOR EDUCATION IN REGULAR SCHOOLS: A PRELIMINARY STUDY

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ABSTRACT

Universal design makes places accessible for everyone while Universal Design for Learning (UDL) is a set of principles that guide the design of inclusive classroom instruction and accessible course materials. This study was conducted to know that in this era of inclusive education with universal design for learning, what facilities are available for the children with special needs in the present regular schools for education of all. Considering the guidelines for barrier free environment by Ministry of urban development, Govt. of India and the universal design for learning, a questionnaire was developed. Participants were a teacher of 20 reputed schools of Lucknow, Uttar Pradesh. In the physical space and infrastructure, there were various short coming in the school structure. Ramps, rails, elevators, Pictographic maps, loop induction units were lacking in all the schools studied. More accessibility was observed in means of representation, action expression and engagement. 40% of school which were mostly preschools were found to be more universal in design. The use of universal design for learning to meet the educational needs of diverse learners is a promising instructional approach. There is need for more awareness of inservice teachers of regular schools and administration of such schools regarding universal design for learning and access.

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INTRODUCTION

Life provides an abundance of opportunities and experiences for all, free of limitations imposed of the built environment. The built environment, however, imposes numerous obstacles for Persons with Disabilities that limit their ability to move about freely and safely. Therefore the united nation convention for rights of person with disabilities (UNCRPD) came into force in India in May 2008, which defined disability as an interaction of impairments and barriers that hinder effective participation in a society. The Article 9 of UNCRPD, which emphasizes Accessibility i.e., To enable Persons with Disabilities to live independently and participate fully in all aspects of life, All organizations and society shall take appropriate measures to ensure access to Persons with Disabilities, on an equal basis with others, to the physical environment, to transportation, to information and

communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces; Information, communications and other services, including electronic services and emergency services. The benefits of accessibility to education are significant. Aside from responding to the needs of Persons with Disabilities, increasing accessibility leads to increased opportunities for Persons with Disabilities to access employment and to fully participate in the social, cultural, recreational, economic life of India. The Barrier Free Design Guidelines (Ministry of urban development, GOI, 2016) which are based on Universal Design principles, is to guide

City authorities "that public buildings, parks and open spaces should be open and accessible to all members of the public including people with disabilities." Universal design makes places accessible for everyone while Universal Design for Learning (UDL) is a set of principles that guide the design of inclusive classroom instruction and accessible course materials. In todays era of inclusive education, the educational practices that support education of all students in common education classes are: Effective Instruction, Universal Design for Learning (UDL), Curricular Adaptation/modification, Positive Behavior Supports etc. Realizing the reality of diversity the place of education, be it preschool, primary school, secondary school, or higher secondary school, should be such that, it should provide accessibility to all. One such design which abides the above principle is Universal Design for Learning. It includes three principles: 1) multiple methods of representation that give learners a variety of ways to acquire information and build knowledge; 2) multiple means of student action and expression that provide learners alternatives for demonstrating what they have learned; and 3) multiple modes of student engagement that tap into learners' interests, challenge them appropriately, and motivate them to learn (Center for Applied Special Technology, 2011).If the goal of UD is the removal of barriers from the physical environment, the goal of UDL is the elimination barriers from the learning environment. Considering the barrier free environment and universal design for learning, this study was conducted to know that at present how much of the universal design guidelines are present in the school set up of the schools in a capital city, Lucknow.

Aim

To explore the availability of universal design in present educational setup.

MATERIALS AND METHODS

Considering the guidelines for barrier free environment by Ministry of urban development, Govt. of India and the universal design for learning, a questionnaire(Annexure II) was developed to find how much the present infrastructure and education method used in schools are universal in design and accessible by the children with special needs for inclusive education. This questionnaire had 10 categories of Physical infrastructural barriers removed for inclusion of all, while a 11th category of educational reforms. In these 10 categories a total of 55 points were taken and In the 11th category of universal design of learning a total of 25 points were considered (13 multiple methods of representation of content were taken while 6 multiple methods of expression were taken and 6 multiple method of engagement). Participants were teachers of 20 reputed schools of Lucknow, Uttar Pradesh. This city was selected since this is the city which has Dr Shakuntala Misra National Rehabilitation University with universal design for the higher education of the person with disability, hence awareness for universal design for inclusive education may be expected more in this city than other cities. Descriptive statistics was done to analyze the data.

RESULTS

20 schools were included in the study. 4 were preschools with primary schooling only while other 16 were from Kindergarden till Higher Secondary. The observations in various categories included are as follows.

a) Main entrance: 100% schools had accessible main entrance, with clear width of atleast 1000mm and height of door handle at 1000mm. the entrance was clearly identifiable in all the schools. None of the schools had handrails and ramps. And only 15% school were found to have landing surface non slippery.

b) Parking: Although 100% school had parking but only 10% of the school parking was accessible and 70% school had accessible path of travel form the drop of area to the main entrance.

c) Reception and Information counters: 100% of the schools had easily identifiable reception counter & 90% had them at a ht. of 800 mm. to 1000 mm. 75% of the reception counter were well illuminated. None of the school had loop induction unit installed at the counter and a tactile pictographic map near the counter.

d) Doors: 75% of schools have door which can be operated without much effort and 70% have sufficient space inside the latch side of door . Only 5% had automatic doors at entrance. None of the door with spring closure had an extra pull handle and a hand ware lower than 800 mm.

e) Corridors: No schools had any protruding object which cannot be detected by a cane, 90% of schools had corridors atleast 1500 mm wide. 85% had space for maneuvering wheelchair through doors along its length. All obstacle in corridors can be identified by low vision in 80% schools. And only 10% had ramps or lifts to bridge the level differences. None of the schools had obstruction mounted above a minimum height of 2200 mm.

f) Stairs: 70% schools had stairs 1200 mm wide and 35% had an emergency stair clearly identifiable. None of the schools had continuous handrails on both sides of stairs and step edge marked with different color or texture. No schools had warning blocks installed at the beginning and end of the flight.

g) Toilets: All schools had hot water pipes covering and flushing arrangement at lower height which are easy to operate. Although only 20% had accessible toilet for PWD. The toilets were not easily identifiable in any school and did not have sufficient space to maneuver a wheel chair.60% schools had water closet at height between 450 mm. and 480 mm. but did not had grab bar near water closet. The lower edge of mirrors positioned at a height not exceeding 1 mm. in 40% schools. 30% schools had emergency alarm in toilets. Only 25% schools had floor material skid proof, well drained and water proof in toilets.

h) Drinking water: Drinking water tap was accessible in 55% schools with easily maneuver tap in 40% schools. The drinking water area was not dry in any of the school.

i) Signages: Only 15% of schools had wall mounted signs and maps info panels at ht. between 900 mm. to 1800 mm. No schools had international symbol of accessibility and directional signs indicating the location of accessible facility.

j) Public telephones: 70% schools had public telephones accessible to wheel chair user and 80% schools had telephone area with knee space of 750 mm. Only 55% schools had telephone at a ht. of 800 mm. to 1000 mm.

No schools had telephone loop induction unit, numerals on phone raised and proper signage's directing to public telephone.

k) Flexibility in education: 100% schools provide visual clues and schedules, background, knowledge, illustrative vocabulary, working with a partner, reading aloud highlighting phrase, multimedia for understanding, flexibility in use of tools to access information and flexible grouping strategies. 90% schools used dictating responses for representation and 80% schools gave choice in means of expression. None of the school had signs and symbols, text to speech instruments build in glossaries and build in lg. translation. Only 20% schools had resources person for children with special needs. Only 4% of schools were having children with special needs. 45% school had easy grip tools. Only 10% schools had caption on television.

and an extra pull handle was not provided. If a child reaches the school with a wheel chair, he will face a lot f barrier to reach his particular classrooms there were no ramps or lifts in observed schools. If his classrooms at ground floor, he will face difficulty in using toilets and drinking water however, of universal design for learning (Figure 2), we could find more accessibility in means of representation then expression. The use of universal design for learning to meet the educational needs of diverse learners is a promising instructional approach. In addition, the flexibility with which educational software programs offer multiple opportunities for representation, expression, and engagement for student learning is encouraging for teachers as they search for the most effective instructional strategies needed to meet the educational needs of increasingly diverse student populations. As this study reflects outcomes of similar research, these are tools that teachers need to develop expertise with in order to engage students at all levels (Howard, 2003).The matter of concern with so much of
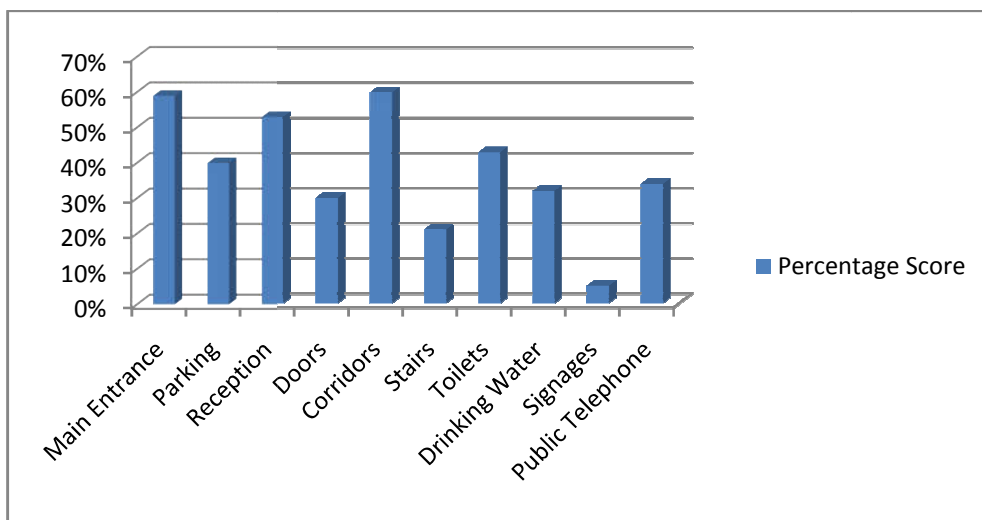

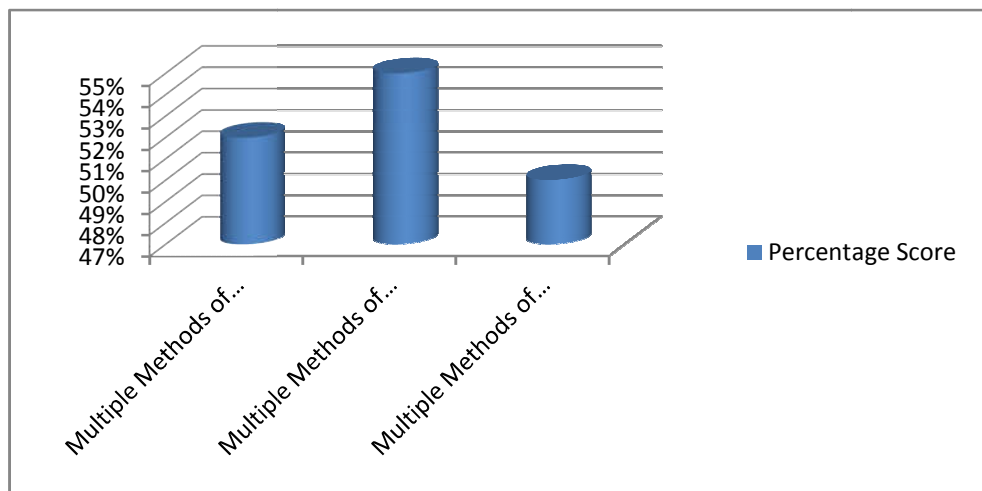**Figure 1. Accessibility in physical space at educational setups**

Figure 2. Accessibility in learning and education

DISCUSSION

The data as seen in Figure 1, reflects that a person with special need may enter a school, since the main entrance was accessible, could park a vehicle (with a little difficulty though) and could get information (with a score of 53%) at reception counter . Even the corridors were accessible (with a score of 60%) but barrier was high for doors where handle was high

physical barriers in infrastructure is that how such school will become inclusive setup without reforms and what measure should be taken to sensitize such professional. In addition, teachers need to understand how such approaches to instruction can be designed to most effectively use educational software programs to meet students' individualized instructional goals. Of all the items the most important fact is the lack of accessibility to classrooms due to lack of rails and

lifts. Use of different means to represent and express and engage was more diverse in preschools than regular schools (from 1st till 12th standard).

Conclusion

The need for more awareness of in-service teachers of regular schools and administration of such schools regarding universal design for learning and access. This was a primitive study which highlights the need of detailed study for assessment of the present setup of primary education for its design to allow access to all. In India, where we have Dr. Shakuntala Misra National Rehabilitation University which offers universal design for access to children with special needs for fulfilling their dreams of higher education and career development, we must think of facilitating the primary and secondary education setups to be inclusive and modify their designs to absorb all children. With this preliminary study, it was an attempt to bring in light the barrier to inclusive education. there is more need of study can then be conducted to find the impact of such programs and further needs to implement inclusive education in all schools

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Annexure II: Questionnaire

Dear educator,
Teachers are reformers of the society. The major reform required for the person with disabilities is their inclusion in regular schools with universal design for their accessibility. Your participation in this study by completing the following questionnaire can contribute to awareness and realization of ground level difficulties persistent in the educational setups for the person with disabilities. We are thankful for your support. Kindly complete the following checklist.

Annexure I: Universal Design for Learning Guidelines

Universal Design for Learning Guidelines

I. Provide Multiple Means of Representation
1. Provide options for perception
- Options that customize the display of information
- Options that provide alternatives for auditory information
- Options that provide alternatives for visual information

2. Provide options for language and symbols
- Options that define vocabulary and symbols
- Options that clarify syntax and structure
- Options for decoding text or mathematical notation
- Options that promote cross-linguistic understanding
- Options that illustrate key concepts non-linguistically

3. Provide options for comprehension
- Options that provide or activate background knowledge
- Options that highlight critical features, big ideas, and relationships
- Options that guide information processing
- Options that support memory and transfer

II. Provide Multiple Means of Action and Expression
4. Provide options for physical action
- Options in the mode of physical response
- Options in the means of navigation
- Options for accessing tools and assistive technologies

5. Provide options for expressive skills and fluency
- Options in the media for communication
- Options in the tools for composition and problem solving
- Options in the scaffolds for practice and performance

6. Provide options for executive functions
- Options that guide effective goal-setting
- Options that support planning and strategy development
- Options that facilitate managing information and resources
- Options that enhance capacity for monitoring progress

III. Provide Multiple Means of Engagement
7. Provide options for recruiting interest
- Options that increase individual choice and autonomy
- Options that enhance relevance, value, and authenticity
- Options that reduce threats and distractions

8. Provide options for sustaining effort and persistence
- Options that heighten salience of goals and objectives
- Options that vary levels of challenge and support
- Options that foster collaboration and communication
- Options that increase mastery-oriented feedback

9. Provide options for self-regulation
- Options that guide personal goal-setting and expectations
- Options that scaffold coping skills and strategies
- Options that develop self-assessment and reflection

S.No.	Facility	Yes	No
	MAIN ENTRANCE		
1	Is the main entrance of the building accessible?		
2	Do the steps have a handrail		
3	Is there a ramp?		
4	Is the clear door width at least 1000 mm?		
5	Is the height of the door handle between 800 mm and 1000mm?		
6	Is the accessible entrance clearly identifiable?		
7	Is the landing surface non slippery?		
	PARKING		
8	Are there accessible parking facilities?		
9	Is there an accessible path of travel form the drop-off area to the main entrance?		
	RECEPTION & INFORMATION COUNTERS		
10	Are the counters easily indefinable?		
11	Is a part of the counter lowered to accessible height of 800 mm?		
12	Is a loop induction unit installed at the counter?		
13	Are there tactile pictographic maps of the building near the counter?		
14	Is the counter well illuminated?		
	DOORS		
15	Are there any automatic doors at the entrance?		
16	Can the doors be operated without much effort?		
17	Is there sufficient space beside the latch side of the doors (450-600mm)?		
18	Do doors fitted with spring closers have an extra pull handle?		
19	Ismanual door accessories/hardware (handle, lock pull etc.) lower than 800mm?		
	CORRIDORS		
20	Is the minimum unobstructed width of corridors at least 1500 mm?		
21	Does the corridors width allow manoeuvring through doors located along its length?		
22	Are differences in level, bridged with by ramps or lifts?		
23	Can a sightless person with a cane detect all protruding objects with in the corridor?		
24	Are all over hanging obstructions mounted above a minimum height of 2200mm?		
25	Can a person with low vision, identify all obstacles in the corridor?		
	STAIRS		
26	Is the minimum width of the stairs 1200mm?		
27	Are there continuous handrails, on both sides, at a height between 760mm-900mm?		
28	Are the step edges of a different colour or texture easily identifiable by low-vision & vision impaired persons?		
29	Are there warning blocks installed at the beginning and end of all flights?		
30	Is the location of emergency (fire escape) stairs clearly identifiable?		
	TOILETS		
31	Are there accessible toilets for Persons with Disabilities?		
32	Are the toilets easily identifiable?		
33	Is there sufficient space of 2m x 2.2m inside the toilets to manoeuvre a wheelchair?		
34	Are water closet (WC) and bidets mounted at a height between 450mm – 480mm?		
35	Is the space between the WC and the closest adjacent wall, fitted with a grab bar is between 450 mm – 500mm?		
36	Is the lower edge of the mirror positioned at a height not exceeding 1m?		
37	Are the grab bars installed near WC and showers at a height between 750 – 850 mm?		
38	Are hot water pipes insulated or covered?		
39	Is the toilet equipped with an emergency alarm system?		
40	Are flushing arrangements, dispensers and toilet paper mounted between 300mm and 800mm?		
41	Are flushing equipments easy to operate?		
42	Is the floor material skid proof, well drained and waterproof?		
43	Do pivoted doors open outwards?		
	DRINKING WATER		
44	Is the Water tap accessible?		
45	Can it be easily manoeuvred by a person with poor hand function?		
46	Is the area dry?		
	SIGNAGES		
47	Are accessible spaces identified by the international symbol of accessibility?		
48	Are there directional signs indicating the location of accessible facilities?		
49	Are maps, information panels and wall-mounted signs placed at a height between 900mm and 1800mm?		
	PUBLIC TELEPHONES		
50	Are there public telephones accessible to wheel chair users?		
51	Is there at least one telephone in the building equipped with a loop induction unit?		
52	Are the numerals on the telephone raised to allow identification by touch?		
53	Is there proper signage directing to the public telephone?		
54	Are the heights of the operable parts of the telephone between 800mm and 1m?		
55	Is there a clear knee space of 750mm?		
	Flexibility in education		
56	Captions on television		
57	Easy-grip tools		
58	Signs and symbols		
59	Using a microphone		
60	Visual cues and schedules		
61	Building background knowledge		
62	Illustrating vocabulary		
63	Dictating responses		
64	Working with a partner		
65	Read aloud		
66	Highlight phrases		
67	Listen to audiotape		
68	Text-to-speech		
69	Built-in talking glossary		
70	Built-in language translation		
71	Written response		
72	Verbal response		
73	Visual art project		
74	Dramatic response		
75	Multimedia: Power Point, Hyperstudio		
76	Flexibility in use of tools to access information		
77	Choice in means of expression !		
78	Flexible grouping strategies		
79	Curriculum adaptation		
80	Resource person (Special educator)		

Name of School:

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