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Research Paper

Architectural design problems faced by the orthopedically challenged in higher education institutions

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ABSTRACT : Education of students with a disability should be valued as high when compared with as the education of students without apparent disabilities. Acknowledging the value of educating students with a disability requires options for the type and location of their education. To find out the design problem faced by the orthopaedically challenged in higher education institutions. The study was taken up in Hyderabad city of Andhra Pradesh. The ex-post facto research design was used to approach research. 50 orthopaedically challenged students of these four universities and 3 Officers' in-charge of student's affairs /administrative officers from each of these universities were interviewed using interview schedules. In addition, a checklist-cum-observation schedule was used to collect the information. The opinion of the orthopaedically challenged respondents indicated that all respondents (100 per cent) had problem in accessing area class rooms,46 per cent felt difficulty in accessing seminar hall/auditorium, 24 per cent in laboratory, 28 per cent had problem in library,88 per cent faced problems in accessing toilet, 52 per cent had difficulty in accessing canteen while 10 per cent were having problems while accessing parking area. They also had problem with accessing different element like 94 per cent for stairways, 72 per cent for steps, 90 per cent for corridors and 8 per cent for ramps.

KEY WORDS : Orthopaedically challenged, Problems, Apparent disabilities

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A good design aims to enable all to have equal opportunities to participate in every aspect of society. That minces everything that is designed and made by people to be used by people – must be accessible, convenient for everyone (Sunil, 2006). The problem of disability is gaining more and more importance all over the world. However, accessibility has been one of the most neglected issues in the disability sector. The estimated 70 million disabled persons in India remain confined to their homes, as attempts to travel, enter buildings, parks, shops, etc. can be unsafe and humiliating, Reason behind the non-participation of affected masses into the general stream of life is the defective design. It is the design of the built-up and non-built spaces that directly or indirectly determines one's participation. Among different categories of disabled, educational level of people with movement disability is high compared to other categories because of the fact that they face only one barrier *i.e.* movement which can be easily solved by removing constructional barriers. To increase enrolment in universities and colleges to create barrier free educational environment, the UGC had made a one- time grant of up to Rs.5 lacs per university/college. (X plan guidelines, University Grants Commission). The universities and colleges, under this scheme are expected to address this problem according to the "Persons with Disabilities Act 1995", and ensure that all existing structures as well as future construction projects in their campuses are made disabled-friendly. The institutes should create special facilities such as ramps, rails and special toilets, and make other necessary changes to suit the special needs of differently able persons.

The existing educational environment presents many obstacles, including small classrooms, changes in floor

elevation, stairs, narrow halls, inadequate toilet facilities, poor ventilation, minimal electrical outlets and substandard lighting etc. The aim of the building Issue is to make fewer individuals handicapped, by making the physical environment more accessible and supportive. Thus arose the architects and interior designer's need to treat the issue, to find out the design problem faced by the orthopaedically challenged in higher education institutions

■ RESEARCH METHODS

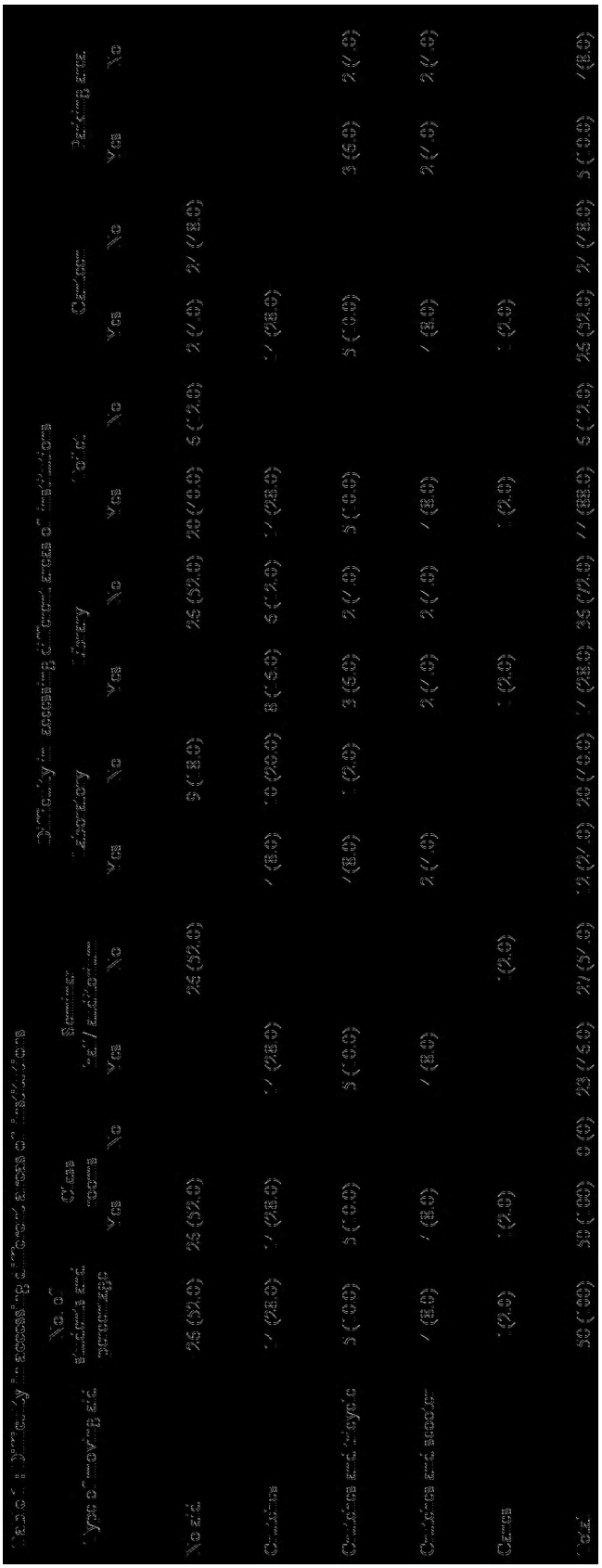
This research was aimed to explore the architectural design problem faced by the orthopaedically challenged in higher education institutions. To achieve this, purposive sampling method was used as Hyderabad city, the capital Andhra Pradesh and six universities functioning in this Hyderabad city. Among these, four universities were identified (Acharya N.G. Ranga Agricultural University, Osmania University, University of Hyderabad and Jawaharlal Nehru Technological University) for conducting research as these fulfilled the requirements for the study. To explore the architectural design problem faced by the orthopaedically challenged in higher education institutions two sets of respondents were chosen, one the Students Welfare Officers of the selected universities and other were the orthopaedically challenged students who were the actual users of the educational building. Three officers who are responsible for the welfare of students in every university were contacted in person. And a total of 50 orthopedically challenged students from four universities were selected for interview personally through purposive random sampling procedure. Two interview schedules were developed to collect the information.

■ RESEARCH FINDINGS AND DISCUSSION

From the total sample, more than 50 per cent did not depend on any supportive aid while the rest used either crutches or canes for movement (Table 1and Fig.1). Out of the total, a small percentage was also dependent on tricycle (10%) and scooter (8%) for movement. The table also depicts that out of 86 per cent of polio affected respondents, 46.5 per cent did not use any supporting aids and all the rest were dependent on crutches and canes. Out of the 12 per cent of the respondents who had birth defects, 83.3 per cent did not use any aids. The only respondent who was affected by accident also did not use any aids for movement.

The data of Table 1 indicate that all the students irrespective of the type of aid used had difficulty in accessing classrooms and about 88 per cent had difficulty in accessing toilet facility. Only crutch and cane users found it difficult to access seminar hall/auditorium, laboratories, library and canteen.

From Fig. 1 it can be observed that the data do not depict the influence on the type of moving aid used by the students



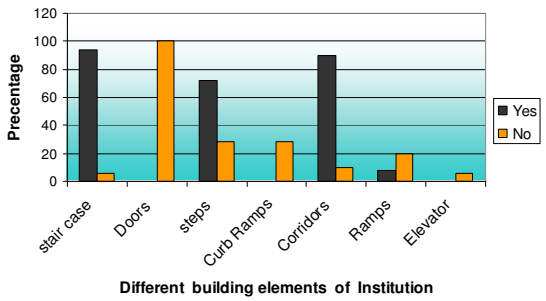


Fig. 1 : Difficulties in accessing different building elements of institution

and its influence on accessing different architectural element. However 94, 72, 90 and 8 per cent of the orthopaedically challenged students, respectively had difficulty in using the elements like stairway that connects different floor levels of building, steps that connect ground to plinth and different levels, corridors which connect the long blocks and also ramps respectively. None of the student had difficulty in operating door. They were also facing some specific problem in accessing different areas and different architectural elements in educational buildings and suggestions given by them, of which these are:

Main buildings :

In different campuses had different provisions like steps, curb ramps, door, entrance landing and non-slippery flooring. Except for steps, other features were satisfactory to almost all. Seventy-two per cent expressed difficulty with the use of steps that connected ground to plinth. The problems related to the design of steps were high riser, design of riser and lack of handrail to support while climbing. The suggestion by them was to replace steps with curb ramp fitted with hand rail. The outcome of the study by Karanti (2000) and Dansk (1984) also reveals that curb ramps should be provided to overcome differences in level between road surface and pathway at building entrances.

Class rooms, seminar hall and auditorium :

They had number of features to access like operable door, seating arrangement, accessible furniture, operable electrical outlets and operable windows. Except for location of classroom, accessible furniture and flooring, other features satisfied all the respondents. Location of classrooms in different floors and distance to walk between classrooms located in different buildings was found to be the problem with classroom. Inadequate leg clearance space to access furniture and slippery floor were also some of the problems posed by students.

Respondents, who were accessing laboratory, were satisfied with the entry door design and dimension but, around 38 per cent had problem in reaching and handling instruments in work station. To some this improper workstation height had given rise to pain in the hands and neck. The suggestion given by them was to reduce the workstation height. This analysis focuses on the need to give attention to anthropometry and reach heights in the design of work stations. A special request for convenience in laboratory was to provide stools or convenient chairs to sit when they had to work for long hours in studio or workshop. These suggestions are also similar to those recommended by Richard (2005) and Allen and Abend (2001) that working counter top height of laboratories should be in between 750mm and 800mm and the workstation should have under-counter knee clearance of atleast 900 mm.

Library and Internet facility :

All were satisfied with the accessible entrance and landing, yet 72 and 92 per cent had problem with access to book racks/shelf and work table and the suggestion given by all of them were to reduce the height of both book shelf/rack and work table for reach. This analysis also stresses on the need to give attention to anthropometry and reach heights in the design of book shelf and work tables.

All had the access to toilet and wash area but only 88 per cent were satisfied with the provision. However internal facilities caused lot of problems to many respondents. Almost 12 per cent of the respondents who were forced to use had floor-mounted W.C, had problem in using this provision. Nearly 28 per cent expressed difficulty with flooring as it was slippery. All of them were provided with wash basin, mirror and operable door and these provisions were satisfactory to all. The suggestions for overcoming the problems in toilet and wash area were provision of grab bar, wall mounted W.C. and non slippery flooring. These suggestions are also in-sequence with the recommendations by Joseph and John (1990) and Dansk (1984) that grab bars should be provided mounted in toilets at a height between 0.85 m and 0.95 m from the floor.

Eating outlets :

Provisions such as adequate of space for circulation path, appropriate height of cash and service counter and accessible table with knee space were satisfactory to all. The only problem expressed with regard to eating outlet was the slippery flooring by 48 per cent, and all of them suggested non-slippery flooring to avoid the problem. Since crutch users require good grip in greasy floor, probably this was suggested for improvement.

Parking area :

Only 12 per cent of the respondents had the facility for accessible parking in their campus with imprinted symbol with adequate parking space. This is one of the ADA standards to provide suitable parking in a nearby distance for physically

challenged. Others who did not have access to this provision were of opinion that campus did not have enough number of accessible parking at nearby parking distances. To overcome these problems, 70 per cent of the respondents suggested the provision of enough number of parking at nearby with imprinted access symbol.

With regard to curb ramps, 28 per cent of respondents who had access to curb ramps were satisfied with the design as it was detectable and provided with handrails. The rest 72 per cent suggested it as an essential feature in the buildings to bridge the levels.

Regarding elevator the information obtained from the respondents revealed that only six per cent had access to elevator to reach higher. It had many satisfactory features like accessible location, accessible elevators path, and appropriate elevators door width, accessible call buttons and non slippery flooring. Some the features which were not present in the elevators were three side hand rail, appropriately mounted height of hand rail are not presents. All the users of elevators were satisfied with this facility in the building. Those who did not have to this feature desired to have this provision for convenience. Studies conducted by Mona (2000) and Lars (1994) recommended that that accessible elevator should be provided in buildings for easy access to all floors level.

Regarding drinking water ninety-two per cent of respondents had access to drinking water provision and the features which satisfied the users were easily operable taps, proper drainage around water taps and sufficient space around water taps. But 8 per cent of the sample had the problem in accessing the tap as it was too high and suggested that the height should be reduced.

Conclusion :

The above analysis on accessing different areas and components which had met the requirements of the respondents indicate that, all respondents had problem with accessing area like class rooms, seminar hall/auditorium, laboratory, library, toilet ,canteen parking area, stairways, entrance steps, corridors, ramps suitable suggestions were also given by them to overcome these problems. In this study, it was also found that educational buildings did not possess so many design features as per standards and recommendations for physically challenged persons.

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