

# Inclusive Informal Campus Spaces through Universal Design India Principles

Gaurav RAHEJA<sup>a,1</sup> and Smita SURYAWANSHI<sup>b</sup>

<sup>a</sup> Associate Professor, Indian Institute of Technology, Roorkee, India

<sup>b</sup> Ph.D. Research Scholar, Indian Institute of Technology, Roorkee, India

**Abstract.** This paper is an attempt to focus upon the role of Universal Design (UD) in informal campus spaces as a means to create access and inclusion. It uses the Universal Design India Principles (UDIP) as an applied concept in the interpretation of accessibility planning issues for an educational campus of higher learning in an Indian context. Based upon a recent live project on conducting access audit for an internationally well known Indian university i.e. Jawahar Lal Nehru University (JNU) at New Delhi, involving the authors as prime consultants, it maps and defines the process employed to guide universal access in educational campus environments. It discusses the various perspectives of contextual relevance of UDIP with diverse users in informal spaces of a typical Indian education context. The paper finds its origin in the belief that universal access in informal spaces on educational campuses would contribute immensely towards an inclusive higher education.

**Keywords.** Informal campus spaces, Universal Design India Principles, Inclusion

## Introduction

According to the World Health Organization more than one billion people in the world are living with some level of disability. From the same about 200 million experience considerable difficulties in functioning [1] and the concentration of Persons with disabilities in India is high. As per the Indian Census 2001, about 2.1% of total population of India is living with some kind of disability. All over the world most of the People with disabilities have poor health condition, lower educational qualifications, less employment opportunities which leads to higher rate of poverty. This vicious circle exists because people with disabilities face barriers to access through various services like transport, education, employment, health and information as well as social communication or participation.

Inclusion in our educational setups is one of the possibilities that emerge as a hope for better future with quality of life of individuals with disabilities. Inclusive education helps to avoid discrimination of students with disabilities. Higher education campuses in India today have a provision for three percent reservation under the Persons with Disabilities Act, 1995 passed by the Indian Government. As a result, provisions for accessibility and inclusion become a mandate for the Indian educational environments. While this approach is inclusive in spirit, in practice a wide range of activities and measures need to be taken beyond the formal education context to ensure a holistically

---

<sup>1</sup> Corresponding Author.

accessible and inclusive education environment. Informal spaces, usually the open spaces between various institutional built forms or deliberately created semi open environments in natural settings form a typical characteristic of interactive campus spaces in India. Such spaces play a vital role in making campus life more rejuvenating, participatory and inclusive in character. However, it has been observed that these informal interactive spaces majorly lack in providing equitable opportunities to Persons with disabilities.

## 1. Significance of Study

Informal or semi-formal spaces on campuses can be discussed as vast subjects and domains of inclusive campus planning that lie unattended or get very little attention from access perspectives in our educational environments. Moreover such spaces provide an active academic environment and a vibrant campus social life. These are also spaces that remain potential nuclei for congregations, discussions and recreational activities making a campus a social microcosm in an urban context. Informal campus spaces and Universal Design (UD) as an approach in India therefore requires a contextual understanding before attempting any strategy to make campuses inclusive.

UD as a theory facilitates and empowers the processes of creating access beyond the common notion of barrier free environments and intending to create spaces that could be used by all with convenience including persons with disabilities (PwDs). Universal Design India Principles (UDIP) [2], a recent theory provides a contextual platform to define other dimensions of universality in Indian context, viz. equity, usability, economy, aesthetics and cultural.

Under the provisions of the Persons with Disabilities Act (PwD), 1995 and being a signatory to the United Nations Convention for Rights of Persons with Disabilities (UNCRPD), India is committed as a nation to eliminate barriers and create inclusion in all sectors including education. For translating the access needs through design processes on ground, it is a long term task especially in already existing campuses owing to challenges of retrofitting. This methodological study on informal campus spaces using UDIP therefore makes a significant attempt for all stakeholders attempting access and inclusion on their campuses.

### 1.1. Background

Jawaharlal Nehru University, New Delhi a central university of national and international importance took an important initiative to make their campus accessible almost two years ago. The university is internationally well known for its higher education and research and provides a very diverse cultural environment with an open perspective to both national and international students and faculty. It necessitates the need to therefore translate its pluralistic cultural spirit into an inclusive built and social environment. The university is located in a typical natural setting of a contoured landscape spread over 1000 acres in the south of New Delhi, housing around 7000 students from across the nation and world [3]. As a genesis of its inception, and its philosophical framework, it is committed to Nehru's vision of making JNU stand for humanism, for tolerance, for reason, and for the search of truth. Scattered informal spaces amidst wild greens and rocky contours reflect a typical character of JNU with coexistence of natural beauty and uneven & informal routes. For individuals (students,

faculty or staff members) with disabilities, the same become barriers to access and making some of these informal spaces unsafe and non-inclusive.

## 2. Research Design

### 2.1. Methodology for Study

As accessibility design consultants, the authors were involved to create an accessibility planning framework through retrofitting designs. This paper focuses on the issues of accessibility faced by students with disabilities on campus for providing design solutions in Indian context. This study is done with ethnographic approach to understand the contextual issues faced by able bodied and students with special needs on JNU campus. Participatory research method forms an integral approach for this study to arrive at a broad understanding of accessibility issues [4, 5]. In this on site research multimodal techniques are used for data collection to ensure validity. Refer Figure 1, for the six stage methodology followed to conduct this study.

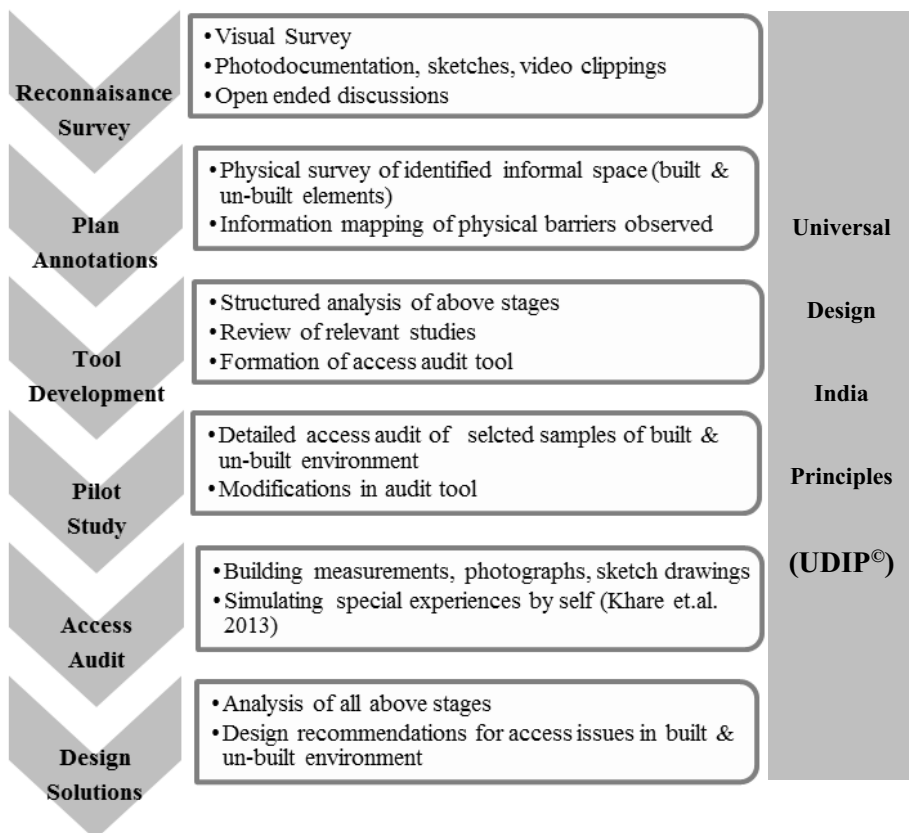


Figure 1. Six stages of work with multiple tools used for each stage (Source: Authors).

2.2. Sampling

Snowball sampling was employed to conduct this study as references to individuals with disabilities led to wider participation and better feedbacks. Refer to Table 1 for data sampling of human subjects for the study. Seventeen students with diverse abilities were interviewed to understand and reflect upon issues related to the informal space between their hostels, which also housed several utility amenities.

3. Access Audit Observations

While access audit was carried out on a large part of JNU campus, this paper limits its scope to the observations made regarding informal spaces at JNU campus, New Delhi. After the initial three stages of reconnaissance study, ground mapping and access tool creation, a physical access audit on site was carried out by the authors along with their team. The observations were recorded as below:

3.1. Description of the Study Area and the Culture of Place

The informal space chosen for access related observations in the JNU campus is a centrally located space flanked by some basic amenities catering to three student hostels (Two male & One female student hostel) along with faculty row housing. Periyar and Kaveri hostels house the male students while female students reside in Godawari hostel. The informal zone between these hostels has explicit contour levels gently cascading from Kaveri hostel towards the amenity area with the other two hostels on each side of this central space. Students with disabilities are preferably accommodated in these three hostels owing to relative proximity to departments, central facilities like library, administrative buildings etc. This emphasizes the need for providing access on priority for all students including students with diverse abilities living in these hostels. The amenities comprise of a bank, ATM, laundry shop, snacks canteen, fruit shop, general store, bicycle repair shop and informal seating spaces in the landscape around it. Most of these centrally located amenities serve the students and faculty families from 8:00am to 10:00pm. Amidst a vibrant informal culture of the place and space, students with visual and mobility disabilities experience myriad barriers to access in this zone.

Table 1. Data sampling of human subjects for study

Disability type	Mobility		Vision		Hearing	No disability	Total
	Manual wheelchair	Three Wheeler Scooter	Total vision loss	Low vision			
Male	2	1	5	0	1	3	12
Female	0	0	1	2	0	2	5
Total	2	1	6	2	1	5	17

### 3.2. Access and Approach (Terrain, Way finding & Parking)

The informal space in discussion is approached and accessed by an upslope road that connects from the main road. The zone has a rocky contoured outcrop with steps and trees scattered. Uneven ground with sharp rock edges remains a hazard for the students using various assistive devices like white canes, crutches, etc. Figure 2, shows unpaved ground surface in front of snack canteen which creates extreme difficulties for students with mobility disabilities to maneuver wheelchairs or other mobility aids in this informal zone. Absence of adequate signage and tactile cues was identified as yet another barrier in the study area. Further, presence of sharp edged natural stones and absence of guiding blocks leads to immense inconveniences and makes students with vision impairments quite vulnerable. Parking areas were found to be casually demarcated with unstructured ways of parking behavior by students, visitors, etc. as a contextual issue. No additional conveniences were observed in and around the space that could enhance the inclusivity of this informal space.

### 3.3. Facilities (Bank, ATM, Snack Canteen, General store)

The common facilities available in this informal space include a Bank, *ATM*, Snack Canteen and a General store. Small ramped entry to the bank is mostly blocked by two wheeler parking as no demarcated parking space is available. The clear width of entry door to bank is 850 mm, which makes it difficult to pass through for most people with mobility difficulties. For wheelchair users it is inaccessible. The banking counters are mostly at 1050 mm in height with absence of low height counter for Persons with disabilities. The *ATM* is approached by a ramp of gradient 1:12, which is quite cumbersome to maneuver a self-propelled Indian wheelchair. The handrails provided on both sides of ramp end abruptly and are not as per the barrier free guidelines for built environment in India. Absence of landing space in front of entry door of *ATM* cabin creates inconvenience for wheelchair users. In the snack canteen and general store, service counter is at a height of 800 mm without knee space clearance below it. The ground level in front of snack canteen is very uneven and causes imbalance and gait problems to students with different disabilities, which is illustrated through Figure 2. Insufficient illumination adds another accessibility issue of safety in space for stakeholders with different sight levels. Access to general store is usually blocked by the display stands and two wheeler parking. The vertical support of extended canopy becomes major obstruction for the students with vision impairment.



**Figure 2.** Snack Canteen Space



**Figure 3.** Informal Seating Space

### 3.4. Circulation (*Seating Arrangement, Services & Pathways*)

Informal spaces on the whole in this contoured landscape have circulation pathways, though not very well defined and inaccessible to certain stakeholders with special needs. The seating arrangement in front of the snack canteen utilizes built up furniture which is not usable by students with lower limb difficulties. To approach seating arrangement one has to climb steps with riser more than 200mm making it inconvenient to step up especially when both hands are occupied with snacks/eatables and crutches. Else, steps are used as an alternative to sit and recreate in front of the snack canteen. Wheelchair users face exclusion due to inappropriate interface between snack canteen and informal seating spaces as shown in Figure 3. The litter bins on site are usually open with issues of waste overflow and low maintenance problems creating further problem of dogs. The students with vision impairment in particular face difficulty to use facilities due to these dogs. The spillover of water near water facility makes the ground slippery. A small pathway with soft landscaping, adjoining to seating area of canteen reduces the travelling distance between two hostels Periyar and Kaveri (both are boy's hostels). Both entries of the pathway is blocked by chains to restrict two wheeler entries, becomes obstruction for everybody to access this area.

These obstructions were documented and discussed with administrative authorities along with participant samples selected for study. The design solutions for these issues in Indian context need customization, as these campuses are a host to a diverse range of student populace. UDIP as a contextual approach becomes the most appropriate guiding tool to improvise access and support inclusion in educational spaces.

## 4. Discussions

Inclusion in education systems has deep and layered connotations especially in an Indian education scenario where it spans between equitable opportunities to cultural diversity and socio economic gaps to diversity of human abilities. Inclusion through informal spaces in this particular example meant to initiate a dialogue to look at it not as a subject of seclusion but a concern of access that relates to all.

Mapping the needs of students with disabilities from diverse cultural perspectives and a UDIP spectacle of this context provides a rich insight into an evaluative perspective such that most of the countries in the world follow the UD principles designed by USA. India is a country with diverse culture and traditions. The Seven Principles of Universal Design (USA) have an overarching acceptance globally as a reference point. However, UDIP are developed to complement these principles and contextualize them to address regional requirements in India [2]. To address the needs of diverse Indian users across ability, age, socio-economic strata and culture, UDIP were developed by an interdisciplinary team of designers and architects [6]. These principles value equality for all and address social and cultural diversity due to change in languages, cultures, economics and regions of India. The five guiding principles as laid by the UDIP interdisciplinary team (corresponding author included) are given in Table 2.

**Table 2.** Universal Design Indian Principles [2]

S.No.	Principles	Description
1	Equitable	The design is fair and non-discriminating to diverse users in Indian context
2	Usable	The design is operable by all users in Indian context
3	Economy	The design respects affordability and cost considerations for diverse users in Indian context
4	Aesthetics	The design employs aesthetic to promote social integration among users in Indian context
5	Cultural	The design respects the cultural past and the changing present assist all users in Indian context

#### 4.1. *Equitable*

Equity in informal campus spaces could be achieved through equity in approach, parking and provision of amenities that facilitate all stakeholders. Designated parking area with reservation for Persons with disabilities, guiding blocks with adequate colour contrast and clear graphic signage would help students with diverse abilities, linguistic and cultural backgrounds to orient, use and participate equitably in the campus informal spaces.

#### 4.2. *Usable*

Usability implies an efficient and convenient use of space by all. For the campus informal zones, enhancing usability would require provision of accessibility features like finished ramp as per guidelines for ATM, leveled surfaces, adequate door width and access provisions for banks, low counter heights with knee space in banks and general stores, guiding path with tactile cues on circulation pathways, etc. The ramp as shown in Figure 4, is a retrofit design solution to improve access and usability of the ATM facility. Social transitions in parking behavior and space usage require participatory ways of sensitization amongst peer groups about the needs of individuals with special needs.

#### 4.3. *Economy*

Economic interventions to retrofit informal spaces for improved access, forms an important decision making criteria for accessibility in Indian context. An economically feasible design solution shall remain important criteria for affordability in India contexts. Indigenous, low cost assistive technology and human interdependence form other facets of affordable solutions for access in the given context. Stone paving with tactile guiding blocks as illustrated in Figure 5 forms an economically viable alternative for improved access in informal spaces through UD principles.

#### 4.4. Aesthetics

The universal sense of aesthetic in space in an Indian culture is usually echoed by basic upkeep, hygiene and a contextual use of material and form in the given space. The aesthetic dimension of an inclusive informal campus spaces can be best catered by incorporating natural materials with low maintainability like leveled stone pathways, sensory landscape, etc. recommended for flooring along with adequate colour contrast to support movement and use by persons with vision impairment. Indigenous aesthetic taste can be catered in campus informal zones by keeping an apt mix of natural ambience with built or furniture elements. Wayfinding signage, a much neglected aspect of our campus environments could contribute significantly to the aesthetic ways of creating access while adding graphic value to spaces.

#### 4.5. Cultural

Culturally vibrant and sensitive informal spaces help create an inclusive environment on educational campuses. JNU campus with its strong cultural mix includes diversity in spirit in its environs. However, for its informal spaces to be inclusive, the cultural experience of disability needs to be added as diversity of human form as a step towards inclusion. Informal spaces if sensitively designed could truly become melting pots of diverse regional and international cultures in educational environments like JNU.

### 5. Conclusions

Access creation in educational campuses requires a sensitive approach with strategic planning. UDIP have established a contextual dimension of UD applications in Indian scenario and are available for wider application. This paper concludes with two major observations. Firstly, introducing access in informal spaces of educational campuses would truly enhance the spirit of inclusion in education and campus living. Secondly, UDIP as a theory can play a significant role in creating access and inclusion as an applied concept. Informal campus spaces, usually an ignored dimension play a significant role in social cohesion through their functioning. The degree of inclusion offered through its informal spaces would therefore be an important measure for campus inclusivity. In a campus context like JNU, the plurality of regional cultures and diversity of human forms need to be comprehended under the term inclusion. It is to emphasize that access improvisation through informal campus spaces could become an important tool to manifest social integration and hence promote inclusion.



**Figure 4.** Retrofit design for ATM facility



**Figure 5.** Improved access through paving



## References

- [1] World Health Organisation, *World Report on Disability 2011*, Malta, 2011.
- [2] Khare. R., Mullick. A., Raheja. G., Universal Design India Principles @ 2011; A Collaborative Process Of Developing Design Principles, *13<sup>th</sup> International Conference on 'Mobility and Transport for Elderly and Disabled Persons' TRANSED 2012*, 2012.
- [3] J.N.U., *Annual Report of 2011-12*, Jawaharlal Nehru University, New Delhi, 2012.
- [4] Iwarsson S., Stahl A., Accessibility, usability and universal design — Positioning and definition of concepts describing person-environment relationships. *Disability & Rehabilitation* 25:2(2003), 57-66.
- [5] Ambati N.R., Ambati H., Paradigm Shift In German Disability Policy And Its Impact On Students With Disabilities In Higher Education, *International Journal of Social Science & Interdisciplinary Research* 2:4(2013), 22-42.
- [6] Khare. R., Universal Design India Principles: A Methodological Collaborative Framework, *Design for All* Newsletter Design for All Institute Publication, India (2011) 6:11.