Jahangirnagar University Planning Review ISSN 1728-4198
Vol. 18, June, 2020, pp. 75–92

Planning Issues for Inclusive Design of Public University in Bangladesh: Accessibility of the Students with Disabilities

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Abstract

Accessibility of university campus for physically challenged students is a worldwide concern. Every student with disability has the right to equal enjoyment and access in the university.In Bangladesh, numbers of students with disabilities have beenincreased in higher educational opportunities. However, the government has also imposed some legal rules and regulations for ensuring education as well as inclusive design of educational institutions for differently abled students.This paper describes the worldwide planning practices of inclusive and universal design for ensuring accessibility for the disabled students in different universities. Beside this, the legal issues relating to accessibility of disabled students in Bangladesh also have assessed. An overview of planning strategies of some countries like USA, England and India have been comparatively analyzed here. The studyemphasizes onthe issues relating to physical structures affecting universal accessibilities in university campus. Actually, inclusive design is a fundamental need and the rights of the students with disabilities in the university should be protected as well. More specific and potential planning instruments are needed to address this accessibility issue of physically challenged students in universities in Bangladesh.

Keywords: Inclusive design, accessibility, disability, physically challenged, planning standard

Introduction

The provision of universal education is found not only in the developed countries but also in the developing world. Bangladesh is a small country in Asia where universal education is developing gradually (Ahsan & Burnip, 2007). In recent times the Government of Bangladesh has drawn up plans and schemes for educating more students with disabilities (Kibria, 2005). In 1990, Bangladesh government made a declaration on "Education for All" and initiated 'Compulsory Primary Education' through constitutional means (Alam, 2006). The UNESCO also emphasizes on universal education as an essential tool for the country's development. Universal Higher Education can ensure the provision of equality and social inclusion (Barnes, 2007). Now, accessibility for disabled is considered as a human rights concern (CRP, 2002). According

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to the 2011 census, there are 1.41% disabled persons in Bangladesh of the total population. Currently, there are only 2.72% disabled students completed or are in HSC or higher level. It is apparent that disability is an impediment towards receiving education and attaining development (BBS, 2015). However accessibility in buildings has been made mandatory in the "Dhaka Mahanagar Imarat Nirman Bidhimala, 2008". It gave assurance that 'Universal accessibility must exist in all buildings and accessibility for the disabled and all others must essentially be ensured'. The constitution of Bangladesh promised equal treatment of every citizen, but the present scenario is not optimistic in terms of dealing with disablities(Kabir, 2017). In reviewing services to students with special needs, higher educational institutions have to consider progress in removing both physical barriers and social barriers for disabled students (Sergent et al., 1987). The needs of students with disabilities are different, depending on the type and condition of disability. So the physical design should focus on the needs of these special categories of personalities (Hill, 1991). The built environment should offer some activity and environment to ensure that the learning and working in university campus is more pleasant; such as, a good pedestrian network around the campus should be accessible and friendly for all users including disabled persons (Hazreena, 2006). Actually, building facilities and respective designs generally influence students' learning efficiency in the higher level educational institutions (Natasha et al., 2012). Disabled people in Bangladesh face severe difficulties in accessing services, facilities and opportunities.The origin of the problem is lack of awareness regarding disability and general apathy to the needs of disabled people (BBS, 2015). International treaties and conventions, such as the UN Convention on the Rights of Persons with Disabilities have largely recognized the inclusion of all people in society. The frameworks for universal designs offer unique ways to build inclusiveness especially in the educational institutions (Dalton et al., 2019).

In this backdrop, this paper assesses current planning policies regarding the physical design of University for physically challenged students. This research has concentrated on accessibility of physically challenged students in the campus.Major research question for this study is – '**What are the planning considerations and guidelines in providing accessibility for physically challenged students in University?'**The general objective of the study is to identify the planning laws and standards in response to accessibility in physical structure for physically challenged students in the University from national and international context. There are many perspectives to explore the research like social value and cultural outlook, management services etc. However this study only focuses on inclusiveness of physical design of the campus and also highlights some legal issues and policies to understand the legal rights of the physically challenged students.

Methodology

This research is actually done on the basisof secondary literature. To fulfill the objectives of the research, effective series of systematic steps have been followed. The work has been focused onreviewing the literatures, plans and guidelines for ensuring the

accessibility of physically challenged students in the built environment in a public university in Bangladesh.This research paper has described some literatures to establish what are'inclusive design', 'disabilities and disabled students' and how both are related and important in university campus.This research paper also explored how globally inclusive design in university campus for disabled students has been practiced andwhat are recommended or guided in the policies of Bangladesh. However, finally this research paper has attempted toanalyze the planning issues and planning policies regarding inclusive design.

In this study, only street and buildings have been considered and their planning standards have been evaluated. Footpath of walking area (street) and 10 structures of buildings are assessed in this regard. Some of the selected structures are –footpath, floor materials, opening on floor, ramp, entrance, ground surface, doors and windows, protruding objects from walls, reaching range, table, chair, bench, bed, toilet and bathing system, alarm and signage and elevator and stairways.

Literature Review

Concept of Inclusive Design

This term 'Inclusive Design' is mostly used in the UK where it is also described in the British Standard. Inclusive design bears similarities to 'universal design' and 'design for all'. One of the definitions of inclusive design is- "The design of mainstream products and services those are accessible to, and usable by, as many people as reasonably possible on a global basis, in a wide variety of situations and to the greatest extent possible without the need for special adaptation or specialized design" (Keates, 2005). Inclusive design provides buildings and environments that are convenient and enjoyable to use for everyone. People's opportunity to use all elements within the site, including the inside of buildings is crucial (Fletcher, 2006). Inclusive or universal design is a concept which removes obstacles in a space or product accommodating people with different disabilities. The model below shows the relationship between the accessible design, barrier free designs, life span designs and adaptable designs in developing a universal design concept (Deardorff& Birdsong, 2003).

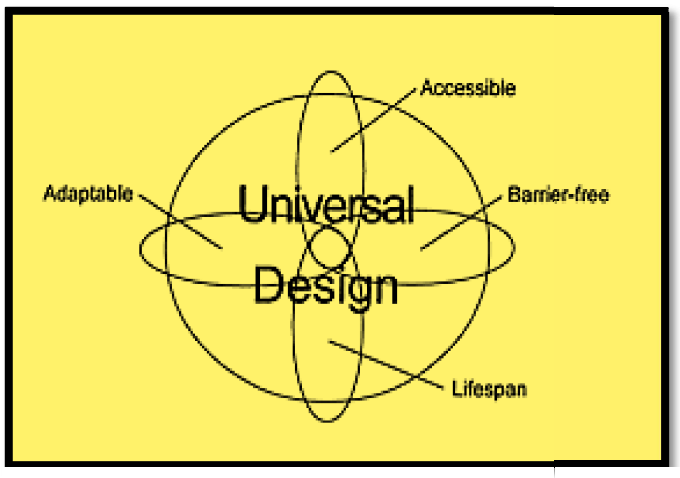

Figure 1: Concept of universal design
Source: Deardorff & Birdsong (2003)

Inclusive-designed structures are built from the beginning to accommodate the widest

spectrum of users, including those with disabilities. Actually 'Inclusive Design' does not imply 'one size fits all' but rather acknowledges the need for alternatives to suit many different people's needs (Rose and Meyer, 2000). Howeverin providing accessibility,wheelchair user-friendly design ensures that it will be large enough to be accessible for other peoples also including both disabled and non-disabled(Ojo, 1987).

Inclusive Design in Public University

A public university is a university that is in state ownership or receives significant public funds through a national government. Public universities are the foremost choice of the majority students seeking higher education (Monem, 2010). Students with mobility impairments, visual, hearing, or speaking impairments and people who suffer from asthmatic and allergic diseases often face barriers in accessing the universities' built environment and services. Inclusive university campus is a combination of a provision of adequate physical access for all students, and ensuring the provision of equitable services and that all students will have a proper comprehension of the environment (Panagiotis, 2012). When considering inclusivity in higher education building design, thought should be given to the various environmental and cultural barriers that can be encountered. Barriers can include inaccessible campus buildings, circulation areas, accommodation, social spaces and amenities, and poor teaching and learning environments (Equality Challenge Unit, 2009).

Concept of Disability and Physically Challenged Students

The concept of 'Disability' is widely and variedly argued by different disciplines. In medical science, to psychologists, to sociologists, to planners and architects disability is diversely defined. Earlier, disabled children were called 'moron' or 'imbecile' or 'idiot'. But later people addressed them as 'special child' and it is being used widely now (Begum, 2003).At present, disability is a human rights concern (Hossain, 2002). However, Bangladesh Disability Welfare Act, 2001 has also defined disability in its own way- "disability refers to any person who is physically crippled either congenitally or as a result of disease or being a victim of accident, or due to improper or maltreatment or for any other reasons become physically incapacitated or mentally imbalanced". But, disability is not something one has, it is something that happens when one group of people create barriers in designing the world only for their style of living (Sharma et.al. 2003).

Disability is a result of the barriers faced by an impaired person. Due to the inter link between all the three disability barriers, namely "Environmental", "Attitudinal" and "Institutional", removal of "Environmental Barriers" can be explained as a multidisciplinary approach led by "Barrier Free Design". "Environmental Barriers" are massive constraints for impaired persons in being independent and to empower themselves (Badungodage & Amirthalingam, 2015).

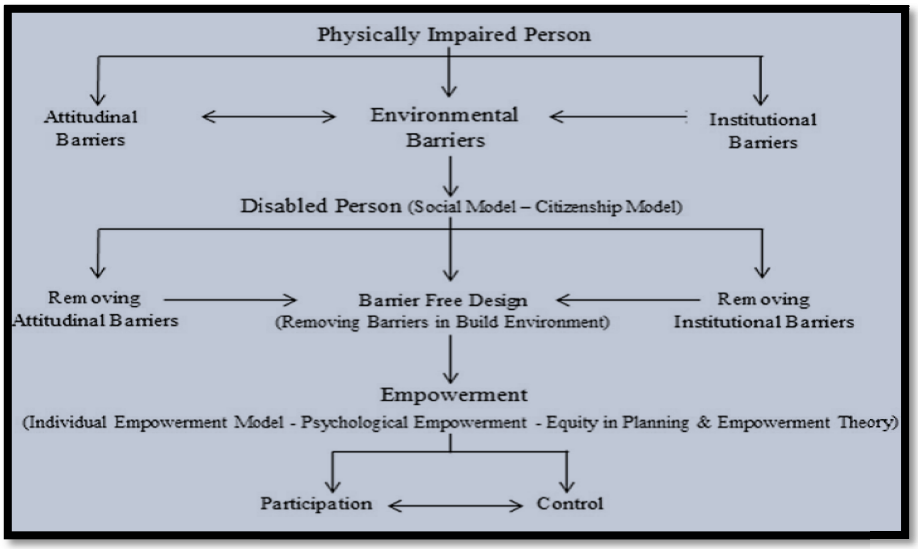

Figure 2: Types of barrier faced by physically impaired person

Source: Badungodage & Amirthalingam (2015)

Social model of disabilities emphasizes on the social barriers than the person's disabilities (Islam & Cojocaru, 2015). In this regard, Yokotani (2001) mentioned that the social model puts emphasis on the sociopolitical context, and strongly suggests that problems are situated in the social structure which tends to exclude disabled people. It is because of both physical and institutional inaccessibility.

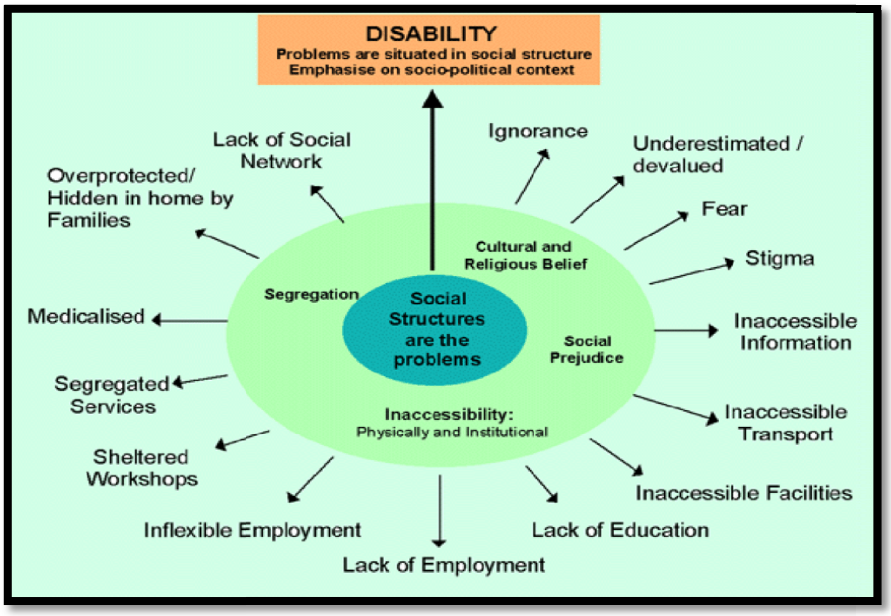

Figure 3: Social model and disability

Source: Yokotani (2001)

Physically Challenged students are students with some physical or mental impairment that substantially limits one or more major life activities (US Legal, 2019). A student with a disability is defined as "a student with mental retardation, hearing impairments, speech or language impairments, visual impairments, serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities; and who, by reason thereof, needs special education and related services" (NCES, 2019).

The Importance of Inclusive Design in University

The introduction of laws and regulations in many countries has imposed to protect the rights of students with disabilities and the number of students enrolled in institutions of higher learning has increased (Hill, 1992). Students with disabilities need to feel welcome on campus (Fichten et. all, 1990) and given accommodations to learn (Nelson, Dodd, & Smith, 1990). Education in general and post-secondary education in particular, is a predictor of gainful employment in meaningful occupations, opening opportunities for career development, hence for quality of life (Dutta, Scguri-Geist, & Kundu, 2009). Accessibility to higher educational institutions is therefore especially important for people with disabilities (Rimmerman & Araten-Bergman, 2005). There are three primary motives for obtaining a postsecondary education, regardless of whether or not the student has a disabling condition. They include: (a) fulfilling personal goals, (b) allowing for effective competition in the job market, and (c) contributing to independence and financial security. For the student with disability, higher education is more important. Individuals with a disability, who graduate from university, spend less time seeking employment (Fichten, 1988).

Result and Discussion

The Requirements of Physically Challenged Students in University Campus

In ACTUS Guidebook, Panagiotis (2012) suggested some needs of the students with disabilities; the application of simple and logical design in the built environment in the university. In that research, disabled students are categorized in four types and design-guidelines have been provided for every category of disabled students. The four types of physically challenged students are mobility impairments and wheelchair users, visual impairments and low vision, hearing impairments and speech impairment.

General Requirements for Accessibility to Transport and Roads

- Accessible transport services connecting students' residents
- Clear signage with good contrasts between text/symbols
- Extensive use of pictograms
- Text information using simple language

General Requirements for Accessibility to Buildings

- Firm and even surfaces should be used, easy to maintain and slip resistant
- Automatic or easy-to-operate wide doors, free spaces in front of doors, elevators etc.
- Lift to all floors, suitable for use of wheelchair users
- A minimum width and spacious corridor is preferable
- Steps should be minimally used and a ramp or lift should be constructed
- Staircases with landings at every 10-12 step and suitable handrails at both sides
- Suitable restrooms for people with disabilities
- Easily accessible emergency exits
- Appropriate grab bars and handrails installed, at long corridors, staircases, ramps etc.
- Accessible toilets with shower and proper equipment
- Accessible libraries with accessible desks, computers etc.
- Use of info kiosks, visible, audible and tangible information in signs etc. (e.g. Braille)
- Audible info and visual alarm in case of an emergency
- Good lighting conditions
- Extensive use of pictograms
- Low physical effort
- Safe and comfortable design

Legislation and Regulations for Disabilities

Global Context

Now it is important to look into, what is happening all around the world mostly relating to accessibility in recent days. There have sufficient laws and regulations for protecting the rights of physically challenged people. Laws of America, England and India relating to disabilities have been assessed. These laws are summarized and described in below-

Americans with Disabilities Act, 1990 (Amended in 2014)

The ADA is a civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life and all public and private places that are open to the general public. The purpose of the law is to make sure that people with disabilities have the same rights and opportunities as everyone else. The act includes-

1. Outlines requirements for disabled-friendly planning; making reasonable modifications of policies and practices to avoid discrimination; identifying architectural barriers etc.,

2. Prohibits places of public accommodation like privately owned, leased or operated facilities from discriminating against individuals with disabilities and
3. Sets the minimum standards for accessibility for alterations and new construction buildings to remove barriers.

Equality Act, 2010 (England)

The Act makes provisions regarding the requirement to make reasonable adjustments for disabled people in relation to services and public functions, premises, work, education and associations. The act provides a duty to make reasonable adjustments for disabled peoples. The duty comprises three requirements which are-

1. Changing the way things are done,
2. Making changes to the built environment and
3. Providing auxiliary aids and services.

Rights of Persons with Disabilities Act, 2016 (India)

The RPWD Act, 2016 provides that "the appropriate Government shall ensure that the persons with disabilities enjoy the right to equality, life with dignity, and respect for his or her own integrity equally with others." The summarized description of this act, as rights and entitlements government has to take some initiatives-

1. To ensure that the persons with disabilities enjoy their rights equally with others,
2. Accessibility to inclusive education and employment of disabled persons and buildings, campuses, and various facilities are to be made accessible by the PWD,
3. Additional benefits such as reservation in higher education (not less than 5%), government jobs (not less than 4 %) etc. have to be provided for persons with benchmark disabilities,
4. Every child with benchmark disability between the age group of 6 and 18 years shall have the right to free education and
5. Government funded educational institutions as well as the government recognized institutions will have to provide inclusive education to the students with disabilities.

National Context

Here, the law by government of Bangladesh has been reviewed. The law is summarized and described in below-

Persons with Disabilities Rights and Protection Act, 2013 (Bangladesh)

The Constitution says that Bangladesh should make sure persons with disabilities have equal rights like everyone else. These include the right to recognition of equal citizenship, right to proper health service, right to use sign/own language and communication, right to 'accessibility' in the community, right to use accessible transportation, right to

education and training and right to discrimination-free employment opportunities. 'Accessibility' refers to opportunities given to persons with disabilities to access all facilities without any obstacles. According to the Constitution, the Government should take necessary steps for the disabled persons especially in educational facilities and these are given below-

1. Provide equal lawful recognition and justice in all levels of education, favorable facilities in the institution and participation in general and co-education,
2. Ascertain active participation in social, economic and national levels according to the types of disability and legal facilities and necessary environment for education,
3. Ensure inclusive education and provides reasonable accommodation to students with disabilities within educational institutions,
4. Provide physical accessibility into all premises (public and private buildings) and
5. Ensure unrestricted access to opportunities and services, information, data, technology and any form of communication.

The National and International Standards and Guidelines for Disabilities

It is important to look into, what is happening all around the world mostly relating to inclusive or universal design in recent days. Accessibility scenario of physically challenged people in the world is not up to the standard in the least developed and developing countries.

International Standards and Guidelines

"ADA (Americans with Disabilities Act) Standards for Accessible Design" by Department of Justice, America (2010)

The Department of Justice published revised regulations for 'Americans with Disabilities Act of 1990' (ADA) in the Federal Register 2010. The planning Standards set minimum requirements, both scoping and technical for newly designed and constructed or altered State and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities.

"The Building Regulations: Access to and use of Buildings" by HM Government, England (2010)

The Building Regulations 2010 are developed by the UK government. Building regulations for access to and use of buildings provides a baseline for accessibility in the built environment.

"Guidelines and Space Standards for Barrier Free Built Environment for Disabled and Elderly Person" by Central Public Works Department, India (1998)

The main objective of the "Persons with Disabilities Act, 1996 was to create barrier free environment for disabled persons to make provisions of them into the social mainstream.

With this intention it was imposed and this document had been provided for the purpose of developing comprehensive guidelines for barrier free built environment.

National Standards and Guidelines in Bangladesh

Dhaka Metropolitan Building Construction Rules (DBCR), Bangladesh (2008)

Dhaka Metropolitan Building Construction Rules, 2008 seek to control development plot-by-plot and case-by-case. It controls development by imposing conditions on setbacks, site coverage, construction of garages, access to plot, provision of lift, land use of that particular plot and height of building, accessibility, universal design etc.

Comparison amongPlanning Standards of Different Countries relating to Accessibility

Comparison among planning standards of some selected structures in America, England, India and Bangladesh has been given below in Table 1. Different structures have been considered here having focus on building and street structures in the university campus.

Table 1: Comparison among Various Planning Standards relating to Accessibility

Structure	Detail Structure	America	England	India	Bangladesh
Entrance	Width of Gate	Min. 32 inches	Min. 32 inches	Min. 36 inches	Min. 48 inches
	Ramp Size	Max. 1:12	Max. 1:20	Max. 1:12	Max. 1:12
	Ramp Width	Min. 36 inches	Min. 60 inches	Min. 36 inches	Min. 48 inches
	Height of Handrails from floor	34-38 inches (need when ramp rise is > 6 inches)	36-40 inches	32-36 inches	32-36 inches (need when ramp rise is > 6 inches)
	Diameter of Turning Space	Min. 60 inches diameter	Min. 60 inches diameter	Min. 60-80 inches diameter	Min. 60 inches diameter
Ground Surface	Floor Materials	slip resistant	slip resistant	slip resistant	slip resistant
	Size of Opening	Max. 0.5 inch	Max. 1.2 inches	Max. 0.5 inches	-
	Height of Change in Levels from floor	Max. 0.25 inch	Max. 0.25 inch	Max. 0.75 inches	Max. 0.25-0.5 inches
Doors and Windows	Width of Door	Min. 32 inches	Min. 32 inches	Min. 36 inches	Min. 32 inches
	Door's Angle	90 degree	90 degree	-	-
	Height of handles, latches, locks from floor	34-48 inches	30-40 inches	Max. 55 inches	34-36 inches
	Maneuvering Clearance Size	Min. 60 x 50 inches	Min. 60 x 50 inches	Min. 56 x 48 inches	Min. 60 x 48 inches

Structure	Detail Structure	America	England	India	Bangladesh
	Window's Height from Ground	27-80 inches	32-40 inches	24-56 inches	-
Walking Corridor	Width of Corridor	Min. 72 inches	Min. 70 inches	Min. 70 inches	Min. 48 inches
	Diameter of Turning Space	Min. 60 inches diameter	Min. 60 inches diameter	Min. 60-80 inches diameter	Min. 60 inches diameter
Protruding Objects from Walls	Height from Floor	27-80 inches	-	24-80 inches	27-80 inches
	Width from Walls	Max. 4 inches	-	Max. 4 inches	Max. 4 inches
Reaching Range	Height from Floor	15-48 inches	16-40 inches	15-50 inches	-
	Width from Walls	0-25 inches	-	0-24 inches	-
Table, Chair, Bench, Bed	Height from Floor of Table	Max. 24-34 inches	-	Max. 30-34 inches	-
	Height from Floor of Chair, Bench & Bed	17-19 inches	Max. 19 inches	14-18 inches	-
Toilet and Bathing System	Mirror Height from Floor	40-74 inches	24-64 inches	28-56 inches	Max. 34 inches
	Shelves Height from Floor	40-48 inches	32-40 inches	54-68 inches	Max. 34 inches
	Basin Height from Floor	Max. 34 inches	Max. 30 inches	Max. 38 inches	Max. 34 inches
	Toilet Seat Height from floor	Max. 17-19 inches	Max. 19 inches	Max. 19 inches	-
	Flush Control Height from floor	Max. 36 inches	Max. 30 inches	Max. 28 inches	-
	Grab-bars	Needed	Max. 32 inches from floor	Max. 28 inches from floor	Max. 32-36 inches
	Height from Floor of Bathing Seat	Max. 17-19 inches	Max. 19 inches	Max. 19 inches	-
Alarm and Signage	Fire Alarm, Braille Signage & Audio Signage	Should be provided	Should be provided	Should be provided	-
Elevator and	Height of Call Button from floor	15-48 inches	36-44 inches	Max. 36 inches	35-48 inches
	Signal Types	visible and audible	visible and audible	visible and audible	-
	Lift Car size	-	Min. 44 x 56 inches	Min. 44 x 78 inches	Min. 48 x 60 inches
	Size of Risers	4-7 inches	6-7 inches	Max. 6 inches	5-7 inches
	Size of Treads	Min. 11 inches	11-17 inches	Min. 12 inches	Min. 11 inches
	Angle of Risers	30-90 degree	60-90 degree	-	

Structure	Detail Structure	America	England	India	Bangladesh
Stairways	Height of Handrails from floor	34-38 inches (need when ramp rise is > 6 inches)	36-40 inches	32-36 inches	32-36 inches (need when ramp rise is > 6 inches)
*Footpath	Running slope	Max. 1:20	Max. 1:40	-	-

*Footpath also includes floor materials, size of opening, height of change in levels from floor, width of walking surface, ramp size

Source: Prepared by Author, 2020

Data Source: ADA (2010), The Building Regulations (2010), Guidelines and Space Standards (1998) and DBCR (2008)

Worldwide Practices of Barrier-free University Campus

In developed countries there are many barrier-free and accessible options in universities. Some of the examples of accessible and universal-designed university havebeen described in below-

University of California at Berkeley (America)

University of California at Berkeley is a pioneer in serving students with disabilities (Shapiro, 1995). In 2019, Segaren described that UC Berkeley assists disabled students with everything they require, from finding appropriate housing to helping with route planning. They also provide accessible furniture for students in the classroom. Some other popular disabled-friendly universities in America are University of Arizona, Indiana University Bloomington, University of Michigan, and University of Illinois at Urbana-Champaign etc.

Figure 4: University of California at Berkeley, America

Source: Segaren, 2019

Brunel University London (England)

Award-winning disability and dyslexia services like the one at Brunel University are leading the way in improving disabled students' experiences. Brunel also encourages sport for people with disabilities. Wheelchair Basketball is the fastest improving Sports Club at Brunel and funds are constantly funneled towards disability sport at Brunel (Kellie, 2019). In 2014, Taft described some of the popular disabled-friendly universities in England that are Queen Mary University of London, University of Nottingham, University of Lancaster and University of Birmingham etc.

Figure 5: Brunel University London (England)

Source: Brunel University London website, 2020

Status of Barrier-free University Campus in Indiaand Bangladesh

Universities in India: Not even one per cent of Indian educational institutions are user-friendly for disabled persons.There are 789 universities in India. Fifty percent of persons with disabilities are under 25 years of age, yet none of the universities are truly accessible (Nayak, 2017).

Universities in Bangladesh: The accessibility of physically challenged students to various facilities in university is extremely poor compared to physically able people (Dulal, 2003). Inaccessible building design is the major constraint in getting education for the physically challenged students. Touhid (2012) revealed that 94.7% educational institutions do not have any ramp or lift facilities to access the buildings.

Key Findings and Issues

It is observed that developed countries are well ahead than developing countries in providing the accessible university and rights to the disabled students. In reviewing policies and acts, developed countries concentrate and emphasize on more specifically on

the built environment, the design and their accessibility. Butin case of Bangladesh, the law provides the assurance of equal rights and access in all sectors for the disabled persons. In the policy mechanisms, there are some drawbacks regarding universal accessibility in Bangladesh. There is no particular guideline or planning standard for disabled-friendly building design and city planning in Bangladesh. There are no specific standard measurements for table, chair, bed, toilet, signage, footpathand many more important structures for ensuring universal accessibility in Bangladesh. However,Government of Bangladesh has promised for ensuring the rights of equal accessibility in universities or educational institutions for the students with disability by various laws, acts and policies. Besides their 'rights', accessibility or inclusive design is the fundamental need of the disabled students as well.

Figure 6: Legal perspective of inclusive design for disabled students in University

Source: Prepared by Author, 2020

Conclusion

This paper focuses on the policy mechanism relating to disable students and inclusive design in university campus. The importance of designing accessible university for the physically challenged students has influenced the emergence of planning and design considerations in buildings and built environments. However, the government of Bangladesh has provided the legal basis to remove physical barriers to ease mobility for the students in educational institutes with the planning laws, althoughthere is no specified and clear planning regulation or standard in Bangladeshto design accessible university or tertiary level educational institutions. It has been found that inclusive design should be considered as basic rights ofthe students with disabilities. Disability rights is a major concern in developed countries, whereas this study found that this important element is utterly missing in the design of the buildings in the universities in Bangladesh.Therefore barrier free development should be strictly practiced in planning process and building design for ensuring universal accessibility for disabled students. Hence the value and social attachment of the disabled students may be rightly ensured that will strength their self-esteem and empowerment.

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