



APPLICATION OF INCLUSIVE DESIGN PRINCIPLES ON INSTITUTIONAL BUILDINGS IN NIGERIA

(A case Study of School of Environmental Science and Technology Building, Federal Polytechnic, Mubi)

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ABSTRACT- Each human being is different. We differ from each other in terms of sizes, abilities, develop different preferences and continue to change throughout our lives. Most of our public facilities (buildings) are designed to be used only by the able people. Disabled, temporal disabled, pregnant women and old aged people find it difficult to access or use the building which is provided for everybody. The aim of inclusive design is to provide a barrier-free or universal environment that is accessible and useable by all. This paper discusses on the application of inclusive design principles on faculty buildings in Nigeria; the school of environmental complex for Federal Poly Mubi was selected and used as case study. The instrument used for collecting the data is observation with observation checklist. The result shows that the principle of universal design is not well applied on the cased building as only two (2) out of the seven (7) principles seems to be applied on the building, while the most important principles are not applied on the cased building. This makes the building not accessible to all users. A building should be accessible to all users irrespective of age, race, and gender, able or disable people. Designers should also be considering all categories of people (user) in their design as everybody have the right to access and use public facilities.

Keywords: [Inclusive design, Universal design, Accessibility, Disability, Built Environment.]

1. INTRODUCTION

We are all physically disabled at some time in our lives. A child, a person with a broken leg, a parent with a pram, an elderly person, etc. are all disabled in one way or another. Those who remain healthy and able-bodied all their lives are few (Svayam, 2014). As far as the built-up environment is concerned, it is important that it should be barrier-free and

adapted to fulfill the needs of all people equally (Grubu, 2014). Each human being is different. We come in all different sizes, have different abilities, develop different preferences and continue to change throughout our lives; some people develop partial, temporal and permanent disabilities, due accident or aging (Calgary, 2010).

In our institutions, courses, technology, and student services are typically designed for the

narrow range of characteristics of the average student, the practice of universal design considers people with a wide range of characteristics in the design of all products and environments (Burgstahler, 2012). Universal design goes beyond accessible design for people with disabilities to make all aspects of the educational experience more inclusive for students, parents, staff, instructors, administrators, and visitors with a great variety of characteristics (Burgstahler, 2012).

The United Nations identified “accessibility” as a priority in measures promoting equalization of opportunities for persons with disabilities. A substantial body of data documents the universal benefits that accessible and usable environments provide all. Accessible and usable environments are non-excludable - accessibility benefits all - and non-rivalrous – use by one person does not detract from use by others (United Nation, 2013).

Therefore, an environment should be design to accommodate not only the able peoples, even if there is no disable person amongst the expected user of the building or environment.

Historical Background of Inclusive/Universal design

According to Duncan (2007), it is generally agreed that the term Universal Design in a number of countries including USA and Japan the ideas of inclusive design are referred to as universal design. The preferred term in the UK is inclusive design, but the general principles are the same (RIBA, 2009). Universal design first entered into usage in the mid-1980 by United States (US) architect, Ronald L. Mace FAIA. Since then the concept has spread worldwide and has influence and joined related concepts such as Design for All, Life Span Design and Inclusive Design. The US remain principally focused on accessibility; developing regulations, codes, standards, policies and procedure to provide societal inclusion to people with disabilities.

But Designing Building Wiki (2013) argue that however it should be understood that the focus of both universal design and inclusive design is about designing for people and not about design for disabled people, for example CABE’S principle of universal design references ethnicity and circumstances as part of the equation.

Definitions Universal/Inclusive design

Universal and inclusive design has been defined by different authors in different ways;

Universal design is a process that results in inclusive products or environment that can be used by everyone regardless of age, gender or disability (Shiple, 2012) Morrow, 2002 defined universal design as an evolving and complex concept, whose definition can be extended to address not only age, gender and disability, but also race, income, education, culture etc Design relies on a holistic and suitable understanding of the responsibilities, of those who shape the built environment in relationship to those who populate it. (Applying universal design principle to ecotown development, 2009) explained the focus of inclusive design. It seeks to provide all inhabitants – regardless of age, disability, faith or gender; with places where dwelling are responsive to individual need and are located within easy access of employment, services and leisure; where public realm does not exclude people and where all residents are enabled to participate fully in public life and enjoy a real sense of belonging to the community.

But (London legacy development corporation, 2012) viewed inclusive designs as a strategy that does not attempt to meet very individual needs but by considering people’s diversity it is possible to break down unnecessary barriers and exclusion, often achieving superior, solutions that benefit everyone while still delivering a good return on public investment and this extent from inception through detailed design, construction, management and operation.

An inclusive environment is one that can be used by everyone regardless of age, gender or disability. It recognizes and accommodates different in the way people use the built environment and provides solutions that enable all of us to participate in mainstream activity equally, independently, with choice and dignity (RIBA, 2009).

Inclusive design is about making places or environment that everyone can use (Fletcher, 2006).

The Principles of Universal Design

A working group of architects, product designers, and environmental design researchers has identified seven universal design principles for use in evaluating existing designs, guiding the design process, and educating both designers and consumers about characteristics of more usable products and environments.

Equitable Use: The design is useful and marketable to any group of users.

Guidelines:

- Provide the same means of use for all users: identical whenever possible; equivalent when not.
- Avoid segregating or stigmatizing any users.
- Provisions for privacy, security, and safety should be equally available to all users.

Flexibility in Use: The design accommodates a wide range of individual preferences and abilities.

Guidelines:

- Provide choice in methods of use.
- Accommodate right - or left-handed access and use.
- Facilitate the user's accuracy and precision.
- Provide adaptability to the user's pace.
- **Simple and Intuitive Use:** Use of the design is easy to understand, regardless of the

user's experience, knowledge, language skills, or current concentration level.

Guidelines:

- Eliminate unnecessary complexity.
- Be consistent with user expectations and intuition.
- Accommodate a wide range of literacy and language skills.
- Arrange information consistent with its importance.
- Provide effective prompting for sequential actions.

Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Guidelines:

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide adequate contrast between essential information and its surroundings.
- Maximize "legibility" of essential information in all sensory modalities.
- Differentiate elements in ways that can be described (i.e. make it easy to give instructions or directions).
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

Tolerance for Error: The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

- Arrange elements to minimize hazards and errors; most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- Provide warnings of hazards and errors.
- Provide fail safe features.

- Discourage unconscious action in tasks that require vigilance.

Low Physical Effort: The design can be used effectively and comfortably and with minimum of fatigue.

Guidelines:

- Allow user to maintain a neutral body position.
- Use reasonable operating forces.
- Minimize repetitive actions.
- Minimize sustained physical effort.

Size and Space for Approach and Use:

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:

- Provide a clear line of sight to important Make reach to all components comfortable for any seated or standing user.
- Accommodate variation in hand and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.
- elements for any seated or standing user.

Commission for Architecture and the Built Environment (CABE) published and promoted the principles of inclusive design as it relates to the built environment.

Inclusive – so everyone can use it safely, easily and with dignity

Responsive – taking account of what people say they need and want.

Flexible- so different people can use it in different ways

Convenient – so everyone can use it without too much effort or separation.

Accommodating for all people, regardless of their age, gender, mobility, ethnicity or circumstances.

Welcoming – with no disabling barrier that might exclude some people

Realistic - offering more than one solution to help balance everyone's need and recognizing that one solution may not work for all (Designing Building Wiki, 2013).

2. METHODOLOGY

The case-study research approach was adopted. There are number of instrument used for collecting the data, these instruments includes; Observation (with observation checklist) and Interview. The observation checklist was designed to enable the researcher to assess and rate the identified research variables on the cased building successfully.

The Study Variables

The variables are the seven principles of inclusive design promoted by the commission for architecture and the built environment (CABE), they are as follows;

- Inclusive
- Responsive
- Flexible
- Convenient
- Accommodating for all user
- Welcoming
- Realistic

Case Study: School of Environment Technology, Federal Polytechnic, Mubi



Plate I: School of Environmental Main Entrance with No Ramp



Plate II: Steps for the School of Environmental Technology



Plate IV: Showing the only means of vertical movement



Plate III: showing Narrow Verandah with and without protective rail

Table 1.0: Checklist for the Assessment of Inclusive Design Principles on the School of Environmental Complex, Federal Polytechnic Mubi, Adamawa State.

Rating Key: 1=Strongly not Applied, 2= Not Applied, 3=Fairly Applied, 4= Applied, 5=Strongly Applied Source: Researcher, 2017

S/N	VARIABLES	CHECKLIST	LEVEL OF APPLICATION					REMARK
			1	2	3	4	5	
1	Inclusive	Save and easy access for all		√				Not applied
2	Responsive	Satisfy user's need		√				Not applied
3	Flexible	Useable in different ways				√		Applied
4	Convenient	Use without much effort			√			Fairly applied
5	Accommodating for all	Useable to all (Young, old and all gender)		√				Not applied
6	Welcoming	Barrier free		√				Not applied
7	Realistic	Multiple solutions to user's need				√		Applied

Table 2.0: Summary of Score for the Level of Application of the Variables.

S/N0	Variables	Level of Application	Remark
1	Inclusive	2	Not Applied
2	Responsive	2	Not Applied
3	Flexible	4	Applied
4	Convenient	3	Fairly applied
5	Accommodating for all	2	Not applied
6	Welcoming	2	Not applied
7	Realistic	4	Applied

Source: Researcher, 2017

The results from the summary table above shows that out of the seven (7) principles of inclusive design (variables) checked, only two (2), that is, realistic and flexible are applied on the cased building. Four (4) most important principles (inclusive, responsive, Accommodating and welcoming) are not applied on the cased building. While the fourth variable 'convenient' is at the neutral, that is, it is only fairly applied.

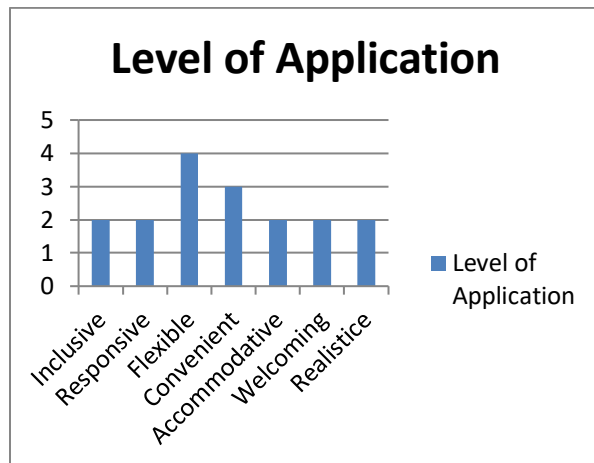


Figure 1: Chart showing the Level of Application

DISCUSSION

Based on the results presented, "Inclusive" is the first variable checked, the result shows that it is not applied on the cased building because the main entrance and the other entrances within the building have change in levels and only steps are provided, which are not suitable to other users. If properly applied, the building will be safe and easy in terms of access for all categories of users. Inclusive is the first principle of inclusive design, the most important principle amongst the seven. The second variable as well as principle of inclusive design is "Responsive" and is also not applied on the building. The "Accommodating" and "Welcoming" are the fifth and sixth principles of inclusive design checked, which are also not applied on the building. Flexible and Realistic are the third and seventh principles, and the only variables that are applied on the cased building.

Convenient is the fourth principle and the fourth variable as well, is the variable that is at the neutral level. It is observed to be fairly applied.

CONCLUSION

Universal/Inclusive design is the best practice of designing new environment today because it embodies two important tenets; sustainable and cost-effective. Making building accessible from the beginning is easier and more cost-effective than retrofitting an existing building. Universally designed projects are built with everyone in mind and can benefit the greatest number of people. Regardless of ability, these environments can be accessible, functional, and aesthetically pleasing. The notion is far from the placement of building components; it is rather a state of being in a context that enables all people of different categories to successfully participate and have a sense of belongingness. It can also be social (interaction), physical (design component and features) and cognitive (learning).

Design professionals should realize that when a disability meets a barrier, it creates a handicap. Designers, architects, planners, or developers should bear in mind that design in these days must also be a universal or inclusive design, which is also an aspect of sustainability. Designers should also avoid making special devices or spaces for one group of people alone; they should make better for all.

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