Accessibility at University Campus in Historical Center

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Abstract. Brazilian legislation, through its Federal Constitution, guarantees to every citizen the right to "come and go" and the right of access to education. Surfing in the legal framework, Brazilian laws and norms ensures a portion of the vacancies in higher public education for a disabled person, as well as, reserves to this public 1% of the vacancies in the board of employees in companies, public or private, with more than one hundred employees, as also minimum dimensions necessary for the use of physical spaces. On the other hand, it is understood that many environments are not accessible and consequently prevent an enjoyment of such rights. It is understood that the university is an environment of vocational training of architects and urban planners and, for this reason, should be seen as a inclusive environment reference. This article presents a study on the campus of the Federal University of Sergipe located in Laranjeiras, a city of great historical and touristic importance to the state of Sergipe and to the whole of Brazil, and where is headquartered the graduation course of architecture and urbanism.

Keywords: Accessibility · Historical center · Public university

1 Introduction

Accessibility is fundamental in the lives of all people, being those that present some sort of disability, the ones that suffer most when there is absence or bad application of accessibility on physical spaces. In Brazil, many face difficulties due to the presence of barriers and/or obstacles that in some cases make possible the displacement, communication, use of equipment and public services, spatial orientation and information retrieval. 23.9% (45.6 million) of the Brazilian population declared to have some disability, and the northeast – region from which the state of Sergipe is a part – stood out as the region with the highest percentage (26.6%), having 21.2% visually impaired, 7.8% physical disability, 5.8% hearing impaired and 1.6% mental or intellectual disability [1].

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It is guaranteed to all citizens regardless of sex, color, age, creed, disability, social or economic condition, the inviolability of the right to life, freedom, equality, security and the right to own a property [2]. The public administration has an obligation to guarantee these rights through laws, decrees, norms, ordinances and public policies, promoting changes in the built spaces, achieving better accessibility conditions, thus enabling the autonomy of all people to carry out any desired activity. In conjunction with state interventions, cultural and attitudinal changes of the general population are needed, mainly people with disabilities, elderly, obese, dwarfs, pregnant women, children, people with strollers and with reduced mobility, temporary or permanent, due to an accident or disease, because these are the ones that are the most harmed with lack of accessibility.

This article presents a study conducted on the Campus of the Federal University of Sergipe located in Laranjeiras-SE, a city of great historical and touristic importance for the state of Sergipe and for the whole of Brazil, and where is headquartered the graduation course of architecture and Urbanism. The choice of the object of study was given as a space for the formation of architects and urban planners and that, for this reason, should be a reference of an inclusive environment.

1.1 Methodology

In this regard, aiming to identify how accessibility conditions, were studied the current norms and legislations concerning the subject, including the following steps:

- Physical and legal survey: measurements were carried out in the built environment, including external and internal areas of the campus, in order to identify compliance with legislation;
- Accessibility experience: practical experience with the students of the course of architecture and urbanism, which simulated difficulties faced by the disabled when circulating through the historic center of the city and on campus;
- Analysis of the results and proposition of interventions for adequacy.

2 Concepts and Definitions

In the course of the last few decades, the world's population is becoming aware of the rights of citizenship of every disabled, increasing the presence of physical spaces, environments and objects that have less difficulty in relation to their use, making them accessible to all [3]. Below are presented some concepts linked to the theme of this article and its definitions.

Universal Design. Suggesting an architecture and a design aimed at the diversity of the human being and establishing criteria that ensure the production of internal and external environments, buildings, urban areas and objects that meet ergonomically the largest Possible quantity of anthropometric, sensorial and age characteristics of users [5].

Accessibility. It is the "possibility and condition of reach, perception and understanding for use, with security and autonomy, of physical spaces, furnishings, urban

equipment, buildings, transport, information and communication […]" (according to the authors) [4].

Barriers. They are "any obstruction or obstacle which limits or impedes access, Freedom of movement, safe movement and the possibility of people to communicate or have access to information" (according to the authors) [6]. They are Classified in the three groups below:

- Physical: Physical components which are present in urban spaces, buildings, supporting furnishings or public equipment;
- Technological: Barriers that are provoked through social evolution or technological progress that do not respect the limitations of part of the population, hindering or preventing access to certain places, Apparatus, objects, communication, among others;
- Attitudinal: They deal with some of the conducts that are caused by the attitudes of the population that cause them. They are caused by lack of knowledge, preparation or ignorance, blocking or preventing any social activity.

Spatial Accessibility. It is related to the possibility of the use and participation of all individuals in the spaces with equality and without discrimination [7].

When there is a need to make modifications to the public buildings already built to ensure accessibility, it is essential to understand all the indispensable needs to carry out activities from the different deficiencies [3].

Its components were classified into four categories [3] possessing instructions that determine spatial characteristics, allowing accessibility in public buildings or showing probable limitations and barriers [8]. These are:

- Spatial orientation: Characteristics that enable the user to recognize the identity and functions of the spaces, defining the strategies that he will use for his displacement and use;
- Communication: Ability to exchange interpersonal information, or exchange of information through the use of assisted technology instruments;
- Displacement: possibility that anyone has to move along horizontal and vertical paths in an autonomous, comfortable and safe way, without;
- Usage: It relates to the effective participation in the carrying out of activities by any citizen, being necessary most of the time to the inclusion of assistive technology equipment.

Many of the disabilities and limitations of people with disabilities do not occur due to the lack of ability to adapt to the environment, but rather to a deficiency of space built up in receiving the various human characteristics. Attesting that the deficiency that people possess is not the cause of immobility; The cause is the lack of adequacy of space [9].

Accessible Route. Continuous path, signaled and without obstructions, connecting the external and internal environments of the buildings being used in a safe and autonomous way by any human being, mainly by people with disabilities [10].

To access a building located in historical sites, the insertion of an accessible route is indispensable, since all the way to the property has to be fit to standalone, safe, free and comfortable use of the user [11].

Deficiencies. Limitation or inability to perform activity [6]. Considering also a person with reduced mobility: one that does not fall within the concept of a person with disabilities, but by some explanation has difficulty of locomotion, permanent or temporarily, generating effective reduction of mobility, Flexibility, motor coordination and perception [6].

It is clear that the architecture and the assisted technology have an indispensable importance for the inclusion of people with different types of disability in the social environment, eliminating and surpassing the present barriers.

3 Campus Laranjeiras

Situated just 22 km from the center of Aracaju, capital of the state of Sergipe, the Laranjeiras Campus is located within the perimeter of the toppling area in the urban center of Laranjeiras. It was inaugurated in 2007, through an initiative of the Monumenta Program of the Federal Government that, in partnership with the Inter-American Development Bank (BID) and the Institute of National Historical and artistic patrimony (IPHAN), restored a set of buildings in ruins to deploy the Campus With the objective of enabling the city's economic stabilization of Laranjeiras, in addition to conserving and maintaining historical heritage recovered [12].

It was developed through analyses made i*n loco,* The discoveries map (Fig. 1), showing through its lines in *dégradé,* of the lighter yellow to the brown the conditions

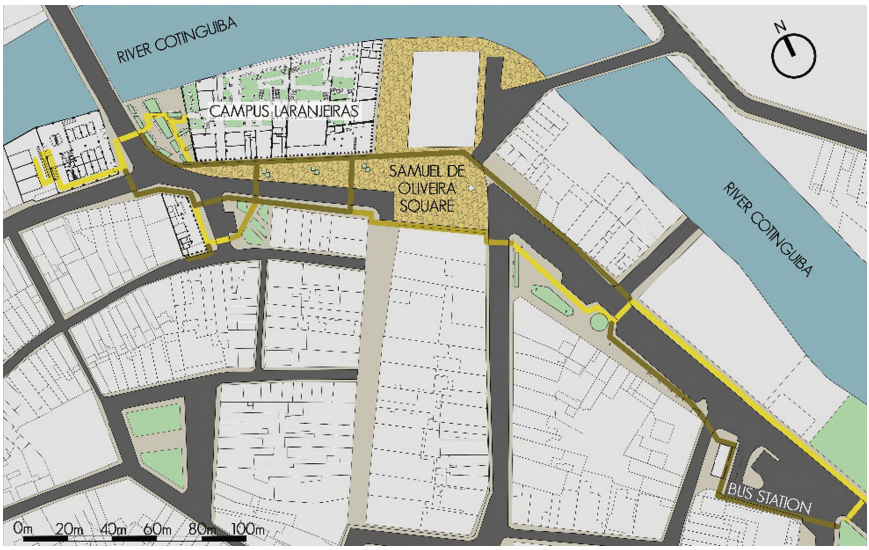

Fig. 1. Discovery map

of the routes that can be performed to reach the dependencies of the Laranjeiras Campus, from the bus station.

- The lighter color represents the snippets with few difficulties for use, such as ramps with a steeper slope than recommended.
- The intermediate color represents snippets requiring small repairs to be used, such as ramp installation and urban furniture relocation.
- The darker color represents snippets that need renovations on the space or the installation of assisted technology equipment.

No analyzed snippet was considered accessible, as there was no lack of difficulties for use, with a disabled person unable to access the campus independently and securely.

3.1 Accessibility Experience

There was in the Laranjeiras Campus and in its surroundings an experience of accessibility (Fig. 2), where the students simulated the difficulties that people with disabilities face to access the campus, as well as circulating through the interior. After the experience, the opinion of all participants was unanimous that a person with disabilities is unable to access the campus autonomously, because travelled routes had several physical and attitudinal barriers, thus affronting the laws and norms that ensure the rights.

Fig. 2. Vivência em Laranjeiras.

3.2 Physical Survey

In the survey, several accessibility problems were found that prevented the autonomy and safety of people with disabilities or reduced mobility. Access to the campus by the four possible ways (school transport, intermunicipal, manned taxi and private car) is hampered, because along the course there are ramps inadequate, absence of vacancies of parking reserved, sidewalks with irregular floors and smaller widths than recommended, besides attitudinal obstacles and barriers that hinder the circulation.

In the interior of the campus is notable the great presence of obstacles and barriers, as for example several uneven levels and ramps with inadequate measures, highlighting the presence of only two bathrooms adapted, one of which is on the top floor, pavement this which is inaccessible due to the lifting platform having defects that made it impossible its use during the whole period during which this work was carried out, thus depriving the use of this pavement by persons with physical disability or reduced mobility.

Another point that aggravates the campus situation is the lack of any equipment, technique, product, service or structure that allows or facilitates the use by visually impaired, hearing impaired, mental or multiple disabilities, making him unfit for this portion of society.

This survey was done through the walkthrough, a method created by Kevin Lynch and widely used in post-occupational evaluation (APO) promoting the familiarization of the observers with the construction in use. It consists of a method of analysis that performs, at the same time, an observation and an interview, making it possible to identify descriptively and to rank the positive and negative aspects of the analyzed environments and/or their uses, highlighting those who deserve more in-depth studies [3].

Complementing this method, it was used the survey worksheets [3] to obtain quantitative information on the situation of accessibility on campus. Spreadsheets have items pertaining to each of the four components: spatial orientation, communication, displacement and usage.

3.3 Results

For verification and tabulation of data, all items answered with “yes”, “no” or “not applicable/inexistent” were considered. These represent a direct question to recognize if the item meets or does not meet the current norms and legislations or when it is not possible to answer “yes” or “no” because there is nothing pertaining to this item to be evaluated. With the results obtained, it was generated to Table 1.

“Displacement” and “Usage” are two components that presented the best positive results but are not significant percentages.

On the basis of the studies carried out for the elaboration of this article, the survey, the analyses carried out in the study object and the data generated through these spreadsheets, it is proven that the Laranjeiras Campus does not present conditions suitable for receiving people with disabilities or with reduced mobility. In this way, this article proposes guidelines to connect the possibilities of access to the campus as well as the use of its environments in an autonomous and secure manner by all people, assuring the right of all citizens.

Table 1. Results found in the application of the survey spreadsheets.

Spreadsheets	Spatial orientation			Communication			Displacement			Usage		
	Yes	No	NA/I	Yes	No	NA/I	Yes	No	NA/I	Yes	No	NA/I
1 - Access areas to the building	0%	38%	62%	0%	0%	100%	4%	36%	60%	0%	7%	93%
2 - Lobbies, reception and waiting rooms.	22%	56%	22%	0%	67%	33%	26%	37%	37%	8%	48%	44%
3 - Horizontal displacement	33%	67%	0%	0%	60%	40%	23%	54%	23%	18%	64%	18%
4 - Vertical displacement	6%	50%	44%	0%	100 %	0%	27%	44%	29%	22%	41%	37%
5 - Toilets for disabled people	0%	83%	17%	0%	100 %	0%	57%	29%	14%	56%	26%	18%
6 - Locations for collective activities	0%	50%	50%	0%	50%	50%	19%	29%	52%	11%	56%	33%

Noting that it is not possible deploy affordable solutions at 100% of the campus, because the same is a historical heritage listed by IPHAN, having characteristics of old buildings that cannot be altered.

3.4 Adequacy Guidelines

Cultural heritage and accessibility are complex issues and demand care, as there are no ready projects or formulas that are easy to apply, and the thorough study of each case is necessary for the elaboration of individual, useful and appropriate solutions that make applicable the right guaranteed by the Brazilian law of access to memory and the city by any citizen, without discrimination.

With the intention of enabling the reach with the security and autonomy of the users in the university, giving conditions of usage of the spaces, furnishings and equipment, eliminating the present barriers, the following guidelines of project intervention concept were elaborated through the analysis and research carried out in the study object, adopting as an example principles already applied and according to Brazilian norms [4, 8, 11], in order to guide the professionals who will be involved in the realization of the projects.

Access. The routes that give access to the buildings must ensure safe and comfortable use, having dimensions, coatings, slopes, visual, tactile and sound signals, in addition to the tactile flooring appropriate; There should be the presence of downgrading of the guides on either side of the public thoroughfare or high track; The identification of the building and its accesses should be seen in a clear and easy way by the users who are on the sidewalk; There should be at least one accessible route between the sidewalk and the main entrance of the building; There should be vacancies reserved near the main entrance; There must be visual information, associated with tactile or sound signaling indicating the functions, accesses or floorings of that place.

Circulations. It must have an accessible route that connects the outer space to the interior of the buildings connecting all the environments of the buildings; In horizontal displacements there should be the presence of informative materials such as tactile maps and visual signaling in contrasting colors; The minimum dimensions, slope, type of knob and the treatment of the floor must be respected; Stairs and ramps should use non-slip, regular and stable floor material, have visual signaling on unevenness in contrasting color, tactile warning signaling, handrails; The elevators must be located on the accessible route.

Spaces and Equipment. Should enable the usage and participation of any person; It must have visual and tactile information indicating the location and usage of the spaces and equipment; There must be at least one accessible toilet by floor properly identified and located on the accessible route; There must be in the auditorium spaces reserved. In addition to suitable place for interpreter of LIBRAS (Brazilian sign Language); The library must have at least one table adapted for wheelchairs and accessible consultation terminal; All common usage environments must be connected to the accessible route and have accessible furniture.

Spatial Information and Services. It must exist in strategic points elements that enable spatial orientation in the building; Usage of tactile alert floor to signal risk situations to the user, guide floor to indicate the paths that should be followed, and contrasts of colors and textures to help people with low vision; Some of the employees should be able to interpret and communicate in LIBRAS.

Security. In the environments and in the circulations it must have light and audible alarm system, which alerts all users to danger and emergency situations; The emergency exits and routes must be easy to identify from the environments present in the building.

4 Conclusion

In this way, the inadequacy of the paving of the external access areas (with unlevel, holes and inadequate/slippery/slip material) was demonstrated, the absence of signaling (visual, tactile or sound information) and the presence of steep ramps. It was also possible to promote the awareness of the students about the importance of the architect in the adequacy of the built environment and the promotion of the fairness of opportunities. It is known that there are numerous limitations for adaptation of this space because it is a heritage listed city by the IPHAN, the Government of Brazil responsible for the preservation of the material and immaterial heritage of the country, because the architectural patrimony cannot be mischaracterized. Although the institute itself proposes some guidelines, it does not apply.

In the case of the studied campus, for the improvement of accessibility, it is proposed the installation of ramps, informational devices (visual, tactile and audible) and circulation tracks with level and anti-slippery paving, solutions that do not harm permanently the Built environment and use contemporary constructive materials and techniques in order not to create a false historical.

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