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* **Adapting Research into an Article**

ACCESSIBILITY RESEARCH IN SCHOOLS IN RIO DE JANEIRO:

ASSESSMENT METHODOLOGY IN TEACHING SPACES

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SUMMARY

Public education is the foundation of democracy, fundamental to overcoming social inequalities. Therefore, planning educational spaces must allow free access for all segments of society to all sectors and levels of learning. This access should not only mean enabling the poorest segments of the population to attend school, but also the elimination of physical and social barriers for people with disabilities (sensory, physical, intellectual, and mental, temporary or permanent). The research that served as the basis for this article managed to generate strategies to overcome the social inequalities experienced by children with disabilities (those in wheelchairs, visually and hearing impaired, etc.) in public educational spaces. When a single student cannot enter a classroom due to a barrier, the functions of education are immediately jeopardized. In this article, we present an adaptation of the tables Guimarães and Fernandino (2001) created to assess physical accessibility. These tables were adapted and applied to the realities of public schools in two case studies: the Federal

University of Rio de Janeiro (UFRJ) application schools and the State University of Rio de Janeiro (UERJ), both in Rio de Janeiro. Analyzing the results allowed the creation of parameters aimed at the spatial inclusion of people with disabilities (PWDs). This enabled the development of action strategies for creating accessible spaces and the actions to be taken by educational institution leaders and educators.

ABSTRACT

Nobody denies the importance of public education as a base for establishing democracy and weakening social differences. Hence, it is well understood that the purpose of planning educational spaces is to allow free access to all segments of society in every sector and field of study. We think that this access is not to be faced with as the possibility of the low-income population reaching school premises, but also as the elimination of every physical and social barrier to People with Disabilities and with Mobility Difficulty (be it sensorial, physical, intellectual, mental, temporary, or permanent disease). The research we outline in this paper has produced many tools which have generated strategies to diminish social differences suffered by children with disabilities and all kinds of people with any disability in public educational spaces (dependents on wheelchairs, blind and deaf people, and so on). We understand that if a single student is blocked from getting into a classroom because of any kind of hindrance, the social function of the educational realm is under target. This paper presents an adaptation of the many physical accessibility assessment charts (prepared by Guimarães and Fernandino,

2001). These charts have been adapted to the reality and living experience of two different public schools in Rio de Janeiro, which have become our case-studies: the School of Applicableness of UFRJ (CApUFRJ) and UERJ (CapUERJ). The analysis of the results allows us to create parameters that aim at the spatial inclusion of People with Disability or with Mobility Difficulty. In this way, it was possible to sketch up some working strategies either for the creation of accessible spaces or towards attitudes to be embraced by leaders and educators in educational institutions.

INTRODUCTION: ACCESSIBLE TEACHING SPACE TO OVERCOME INEQUALITIES

"A brilliant mind prevented from studying by the simple existence of a staircase... there is no crueler form of social segregation than barriers for people with disabilities!" (Duarte & Cohen)

The Brazilian Constitution states in article 208 that: *"...educational care for people with disabilities is guaranteed, preferably in the regular education system"*; and in article 58 § 3 that: "The *provision of special education, a constitutional duty of the State, begins in the age group from zero to six years, during early childhood education"*.

However, a large portion of the Brazilian population lacks access to education, particularly for people with disabilities. This is due to inadequate physical layouts, but also to a lack of awareness among professionals, planners, and managers about the access

needs of people with physical, motor, intellectual, and/or sensory disabilities. Schools are still not prepared to accommodate these physical differences among individuals.

The lack of coexistence between differences tends to perpetuate prejudice and the consequent situation of social inequality in which people with disabilities find themselves in our country. Throughout our research on accessible spaces, we have found that children are free from prejudice and naturally accept differences. Encouraging coexistence among "different" children in public schools can reduce inequalities and integrate people with disabilities socially and culturally into the panorama of Brazilian social development.

School is where children interact, far from the direct influence of family members already "contaminated" by prejudice. Many parents contribute to the consolidation of these prejudices because, in an effort to "protect their children from discriminatory gaze," they end up preventing their children with disabilities from playing with others, perpetuating the cycle of exclusionary culture. Even parents of children considered it "normal" to avoid socialization and the encounter of their children with physical and social diversity.

Photo 1 - *source: assembly by the authors based on a photo available at http://pro.corbis.com/*

The development of projects that address physical and social inequalities in educational settings addresses the need to eliminate one of the cruelest forms of segregation we see across all social classes: the exclusion of people with physical, sensory, and/or mental disabilities.

If built spaces are essential in overcoming inequalities between people, we consider that spaces are particularly important at the elementary school level.

Thus, the research underlying this article focused on the power of coexistence without prejudice and the social function of public education as a strategy for integrating differences and overcoming inequalities for future generations.

THEORETICAL BASIS

The analysis in the baseline research for this work focused on user experience and social sustainability. To this end, our theoretical framework was based on the concepts of "Accessibility," "Universal Design," and "Accessible Route."

To allow for an understanding of the precepts of our analyses, we present an outline of these concepts and a basic bibliography on them.

Access and Accessibility: The concept of Access was developed in a very comprehensive manner by Kevin Lynch as one of the elements to achieve a good city form; Françoise Choay (1988) gives a much broader and more holistic vision of accessibility in her 'Dictionary of Urbanism' and the works

developed by Mettetal-Dulard (1994) and Guimarães (1991) also provide some subsidies for approaching the issue.

Accessibility presupposes the " *possibility and condition of using, safely and autonomously, buildings, space, furniture and urban equipment* " (ABNT, NBR 9050). Thus, accessibility to built space should not be understood as a set of measures that would benefit only people with disabilities - which could even increase spatial exclusion and segregation of these groups - but rather technical-social measures aimed at welcoming all potential users (Duarte and Cohen, 2004-b).

Universal Design and Inclusive Space – The terms "inclusive architecture," "inclusive design," and "inclusive project" are already adopted in specialized literature, encompassing the concept and philosophy of "Universal Design" (accepted as a literal translation of Universal Design, which encompasses the broader notion of universal design and planning). The concept of "Universal Design" encompasses the idea of products, spaces, furniture, and equipment for a wider range of users. In our opinion, this concept represents a positive vision, as it is not restricted to the architectural object, largely transcending its boundaries, whether physically, culturally, or socially.

Accessible Route – The concept of "Accessible Route" refers to a path free of any obstacles from one point to another (origin and destination) and encompasses a range of accessibility measures. In other words, to consider a school accessible, it's

pointless, for example, to indicate the existence of a "ramp" and a "library with shelves at an appropriate height" if there is a turnstile or revolving door between them. The "Accessible Route" has been considered a preponderant factor in classifying inclusive spaces.

Spatial Experience and Spatial Exclusion - We pay special attention to the multiplicity of ways of apprehending space and the specificities that influence the different relationships of affection that people develop in relation to spaces, according to studies by Tuan (1983).

The experience of spaces structures identification patterns between the individual and the environment. According to Tuan (1983: 10), *"to experience is to learn, to understand; it means to act on space and be able to create from i ."* Therefore, the cognitive process must develop through the perception and apprehension of space so the individual can know and act upon it.

The issue of affection for place is, therefore, clearly linked to the experience one can have in this space. Thus, we are interested in the capacity of the *educational space* to accommodate forms of spatial experience and the possibilities for people with disabilities to create emotional bonds and identify with the school where they study.

METHODOLOGY

When we began our studies on educational spaces, we already had instruments and a conceptual and methodological foundation built on previous research. This allowed us to go into the field confidently and with the correct methodology. This methodology included the following steps: a) conceptual design and literature review; b) study of spatial specificities and barriers for the visually impaired, hearing impaired, and various motor disabilities; c) data collection, completion of tables; d) route observation; e) interviews and questionnaires; f) iconographic survey and mapping; g) analysis of the data obtained in the previous steps based on the defined concepts; h) proposals for strategies to overcome inequalities for people with disabilities through access to education. Some of these methodological tools are described below.

Route Description Table

One tool that proved quite effective was the route description table. This table selects simple, viable routes and describes them further to verify accessible routes. The routes are numbered so they can be followed using schematic maps (floor plans of the building with the route marked). This tool proved useful for revealing the true state of routes, as there are often locations with easy access but without a truly accessible route between the point of origin and destination, making it impossible for users to operate independently.

Figure 2: Example of a route description table. On average, 7 tables were created per building.

Accessibility assessment tables

Based on the Accessibility Assessment Criteria table created by Guimarães and Fernandino, another important assessment tool for our research was established. The tables were adapted to the school environment and applied in different schools to adjust them to the needs of the object of analysis.

The tables, after adaptation, were directed to the evaluation of the following school spaces (one table for each type of space): a) classrooms; b) library/media library; c) recreation area and passive leisure area; d) administrative sectors/pedagogical coordination/management; e) kitchen and canteen; cafeteria; f) art and music rooms; g) laboratories; h) theater/conference

room/presentation room and annexes; i) restrooms/changing rooms; j) vertical circulation (ramps/stairs/elevators); l) internal circulation; external circulation and surrounding routes. The figure below exemplifies one of the several tables we used in the research.

Biblioteca / Mediateca
Planilha de avaliação de acessibilidade em Bibliotecas e Mediatecas
(desenvolvida pelo Núcleo Pro-acesso com base em Guimarães e Fernandino, 2001)

Pesquisador:
Data:
Local:

N°	Legislação		E/R/P	quesitos de acessibilidade	em conformidade?		n°. da Foto	obs
	Lei/ Norma	Item / artigo			Sim	Não		
2	9050-04	8.7.2	R	Há pelo menos 10% do total de mesas adaptáveis para PCD?				
3	9050-94	6.2.2	E	Há uma área mínima equivalente a um círculo de 1,50m de diâmetro dentro da biblioteca para uma rotação de 360° da cadeira de rodas?				
4	9050-94	6.2.1	R	Há um espaço com largura mínima de 0,90m para a circulação da cadeira de rodas entre as fileiras de armários de livros?				
6	9050-04	9.5.2.1	E	O balcão de atendimento possui uma altura de no máximo 0,90m em uma extensão mínima de 0,90m de sua superfície?				
7	9050-04	9.5.2.2	E	O balcão possui altura livre inferior de no mínimo 0,73m do piso acabado, para permitir aproximação frontal?				
15	9050-04	7.4.2	E	A altura dos armários (prateleiras) está entre 0,40m e 1,20m de altura do piso acabado?				
20	N.Pró-acesso		R	Há alguma indicação com piso de alerta próximo ás prateleiras ou outros obstáculos?				
21	N.Pró-acesso		R	Há iluminação suficiente, a fim de permitir leitura labial? (maior que 200 lux)				
22	N.Pró-acesso		R	Os computadores possuem sistema de sintetizador de voz? (Ex: Dosvox)				
23	N.Pró-acesso		R	Existem exemplares digitalizados?				
24	N.Pró-acesso		R	As indicações de títulos e temas nas prateleiras estão em letra e tamanho visível?				
25	N.Pró-acesso		R	Existem indicações em Braille na organização da bibliografia?				
27	9050-04	5.7	E	A sinalização sonora está associada à visual?				
41	11.666-1994	3°	E	As portas têm vão livre mínimo de 0,90m?				

Figure 3: This table is for illustrative purposes only. In this example, several evaluation items (46 in the library table, for example) have been removed for readability.

Using the Commented Path Method

To study the UFRJ Application College, the "COMMENTED ROUTE METHOD" (méthode des parcours commentés) developed by Jean-Paul Thibaud was used, with the participation of two wheelchair users, an elderly lady, and a student with low vision.

Thibaud's method involved following students' paths both within and around the school itself. Students with disabilities were invited to walk a specific route, recording everything they saw in terms of physical characteristics and what they felt as they moved. All senses were required to be activated, and in addition to kinesthetic descriptions, sounds and smells were also required . The researchers simply followed the informants, silently recording their reactions. A conversation then ensued between researchers and informants, which proved quite fruitful in obtaining perceptual results. Interviews were then conducted to obtain details about what was perceived while walking.

In this way, we were able to understand better the movement perception of children with disabilities, or the three basic activities of the method: walking, perceiving, and describing. Following Thibaud's methodology, the aim was to investigate perception within a given physical, social, cultural, and temporal context.

Interviews

Research was conducted *with some people with disabilities,* which provided a more detailed understanding of their perceptions of the spaces. The informants invited to participate

in the CAp/UFRJ evaluation considered the situations they are subjected to in the school spaces to be embarrassing.

We also interviewed several architects involved in the renovation and maintenance departments at UFRJ (to which CAp is affiliated). This allowed us to assess their awareness levels and the measures being taken to incorporate accessibility into their plans and projects. These interviews revealed a combination of factors, ranging from a lack of in-depth technical training on accessibility and commitment from administrators at all levels of the university to a lack of genuine political will to address these issues.

## ACCESSIBILITY ASSESSMENT AT THE UFRJ APPLICATION COLLEGE

We chose the UFRJ Application College (CAp/UFRJ) and the UERJ Application College (CAp/UERJ) to study elementary school settings. This choice is due to their public nature and the diversity of programs offered at these schools. In this article, we will present only the case of the UFRJ Application College.

CAp/UFRJ is located in an interesting location for analyzing the surroundings, since it is located next to a church, behind a public hospital, a square, and a theater school.

The Surroundings

We evaluated the school's surroundings based on potential user routes, plotting from the school's main exit to the four

nearest bus stops, the taxi stand, and the only nearby disabled parking space. All routes studied were based on the concepts of Accessible Routes, Accessibility, and Universal Design, as described above.
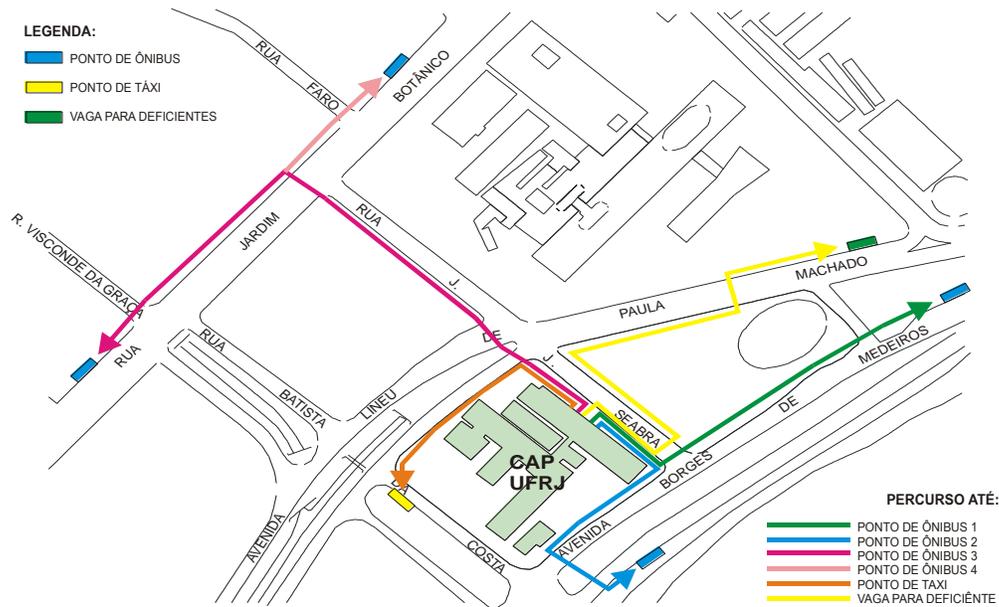
The area surrounding the CAp proved inaccessible, presenting, among other problems: damaged and poorly maintained sidewalks, often cobblestone, with an uneven surface. In several sections, the sidewalk has been destroyed by tree roots. We found bollards that make it difficult to pass, and in other spots, the sidewalk is taken over by restaurant tables and potted plants. There are no guide or warning surfaces, and traffic signals are silent. Pedestrians often must cross a median, which is used for illegal parking. On the other hand, we found corners without ramps, and when there are ramps, they are sometimes blocked by posts or signs.

The closest designated parking space to the school entrance is located on Av. Lineu de Paula Machado, more than 600 meters away. Furthermore, the space is marked only by a sign, with no markings on the ground or a nearby ramp.

Figure 5 (above) sidewalks with holes and tree roots in CAp;

Figure 6 (beside) parking blockers on the sidewalks in front of the bus stop used by students;

Figure 7 (right) – narrow sidewalks, only 45 cm wide in some sections.

The CAp/UFRJ Building

The building housing the UFRJ Application College has two floors. The first floor houses the recreation area, cafeteria, laboratories, and administration, and the second floor houses the classrooms and library. Access to the second floor is via a staircase and a ramp that do not meet accessibility standards, making it impossible for people with disabilities and those with mobility difficulties to access the upper floor.

Although the doors are sized according to accessibility standards (minimum 80 cm wide), so everyone can move freely and independently, most have steps at the entrance, preventing access for people with disabilities.

Cases requiring more basic modifications were evaluated and catalogued, such as: poorly adapted restrooms, narrow access points; non-existent special parking spaces or spaces with irregular access points; uneven paving, high counters; lack of guide floors and/or warning floors for the blind; access points to libraries with turnstiles, elevators without Braille information or without sounders indicating the stopped floors; fire alarms that only sound (which are one of the greatest fears of the deaf), and lack of bibliography consultation systems with voice synthesizers.

Another obstacle encountered is access to the second floor. The ramp, which connects the lower to the upper floor, lacks adequate signage and begins with a step about ten centimeters high, making the accessible route impossible and hindering autonomy.

FINAL CONSIDERATIONS

Since the results we obtained are too extensive to be covered in detail in this article, we believe the most important thing to note is that no route is categorized as fully accessible. Without accessible routes, the building does not allow for accessible circuits from the arrival point to the desired destination within the school. In other words, there is always a need for assistance at some point along the route, and students cannot act independently or autonomously.

When analyzing the school's spaces, we realized that its accessibility is deficient, a legacy of a building constructed in a time When people with disabilities were not considered as users of such spaces, many teachers, when interviewed, emphasize the lack of funding and tend to justify the lack of importance given to accessibility by the fact that " *there are few students with disabilities enrolled at the school* " (sic.). This doesn't mean we should postpone the implementation of measures such as adapting bathrooms, lowering counters, or building ramps in areas with uneven surfaces. Users with physical and sensory limitations go far beyond wheelchair users: would a student with a broken leg, for example, be unable to access the institution until their recovery because they feel discouraged climbing steps several times a day?

To overcome bureaucratic and attitudinal barriers, the measures to be taken must comply with accessibility standards, be monitored by professionals, and embrace the notion that adaptations must be considered for future users with physical and sensory limitations who enter the school. When accessibility is considered from the beginning of the project, there is no risk of encountering intractable problems later.

The accessibility assessment tools used in the research proved effective not only for understanding the physical conditions of the school building but also for understanding the school's operations more holistically. Once mapped, access points and

routes provided important clues about spatial preferences and the social mechanisms that operate within a school building.

Based on the adopted methodology, the CAp analysis allowed for an assessment of perspectives for action in the urban and architectural fields. The conceived space, its understanding, and its appropriation were emphasized as having a preponderant role in the construction of the identity of the professional working in education.

On the other hand, in order to support teaching projects that integrate space and society, contributing to the processes of building full citizenship for all users, as well as supporting the creation of new inclusive urban and architectural design paradigms, we seek to suggest some measures that, briefly, we transcribe below:

1. In a learning space that needs to be adapted, never just check whether the classroom is adapted, but also consider the "accessible route." To accommodate wheelchair users, it is necessary to investigate the existence of desks that allow for accommodation and the layout that does not segregate "special spaces";

2. As a readjustment strategy for everyone, it is important to be concerned about the noise level and ensure sufficient and

constant lighting for students with hearing sensory impairment, to allow them to view classes clearly.

3. Suggest that school principals offer awareness-raising and information courses for teachers. Simple actions by more informed teachers can make a huge difference for students with disabilities, such as facing students when speaking to them and not turning away so that a very bright light source might allow people with hearing impairments to lip-read, etc.;

4. Faculty should be instructed to prepare materials that can be transcribed into a medium other than traditional ones. It can take some time to transcribe a book into Braille, but speech synthesizers now allow files to be read in text editors.

5. Facilitate access to all teaching, research, and extension spaces, such as level-controlled classrooms, auditoriums with ramps, accessible restrooms with grab bars, cafeterias, and other services. This will facilitate the daily lives of people with any mobility impairment and enable their integration into academic life.

6. Definitively and effectively insert a mandatory discipline on accessibility in architecture teaching, direct interdisciplinary research, including broad publication of its results with a view to disseminating these ideas.

7. Access to teaching spaces must be ensured, as far as possible, without discrimination or exclusion, for all categories of users (students, teachers, and staff), and it is necessary to consider the characteristics and requirements of citizens with special needs.

In the case of elementary school settings, we see that schools play a socializing role, fostering mindsets with the power to multiply. School architecture itself plays a role in this socialization, since, by uniting differences, it allows contact with diversity and knowledge of the Other. Thus, if children with disabilities have easy access to the educational space, they will understand that not all children have the same aptitudes, physical, mental, or sensory abilities, but all have the need to be integrated into school and recreational activities, studying and playing with other children, and feeling like one of them.

We know that the inability to experience a space in the same way as another student represents a barrier to relationships. This barrier can, in many cases, be considered greater than the physical obstacles of the school building. This impacts academic performance and distances PWDs from ideal learning and socialization conditions. This idea underpins the concept of Spatial Exclusion (Duarte and Cohen, 1995): spaces become the materialization of segregationary practices and society's worldview. These inaccessible spaces thus act as actors in a silent

apartheid that ultimately generates, among people with physical limitations, the awareness of belonging to a minority excluded from society.

In this context, all educational spaces must be democratized so that they can be understood and used by citizens with special needs. It is up to those responsible for educational spaces to determine whether appropriate technical solutions are adopted to achieve this goal.

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