

What is the literature chapter of scientific paper?

The literature review chapter of a scientific paper is a critical component that provides an overview and evaluation of the existing body of knowledge and research on the topic being investigated. It serves several purposes, including:

- **Contextualizing the research:** The literature review establishes the background and context for the study. It outlines the current state of knowledge, highlights key theories, concepts, and previous research related to the research question or problem being addressed.
- **Identifying research gaps:** By reviewing existing literature, researchers can identify gaps or unanswered questions in the field. These gaps serve as the motivation for the current study and justify its relevance.
- **Evaluating existing research:** The literature review critically examines and evaluates previous studies. Researchers assess the methodologies used, the strengths and limitations of previous findings, and any conflicting or contradictory results. This evaluation helps establish the need for further research and informs the approach taken in the current study.
- **Establishing theoretical framework:** The literature review often involves the identification and discussion of relevant theories or conceptual frameworks that underpin the current research. This provides a theoretical foundation for the study and helps guide the research design and analysis.
- **Supporting research hypotheses or objectives:** The literature review connects the existing knowledge to the specific research hypotheses or objectives of the current study. It provides evidence and rationale for the research questions and hypotheses proposed by the researchers.
- **Citing relevant studies:** The literature review chapter includes extensive citations of previous studies, which helps to acknowledge the work of other researchers, demonstrate the researchers' familiarity with the field, and provide readers with resources for further exploration.

In summary, the literature review chapter of a scientific paper is a comprehensive synthesis and analysis of relevant research and scholarly works that contextualizes the study, identifies research gaps, and supports the rationale for the current research.

How to write the literature chapter of scientific paper?

Writing the literature review chapter of a scientific paper involves several key steps. Here is a general guide on how to approach this section:

- **Identify the scope and purpose:** Determine the specific focus and purpose of your literature review. Clearly define the research question or problem you are addressing and the objectives of the review.
- **Conduct a comprehensive literature search:** Begin by conducting a systematic search for relevant scholarly articles, books, conference papers, and other reliable sources. Utilize academic databases,

search engines, and reference lists of relevant papers to gather a wide range of sources. Keep track of the sources you find, including the author(s), title, publication year, and key findings or main points.

- Evaluate and select sources: Evaluate the quality and relevance of each source. Consider factors such as the credibility of the author and the publication, the methodology used in the study, and the relevance of the findings to your research question. Select the most significant and reputable sources that contribute to the understanding of your topic.
- Organize the literature: Group the selected sources into thematic categories or subtopics based on their similarities or relationships. This organization helps you present a logical flow of information and highlight the main themes or concepts emerging from the literature.
- Summarize and synthesize the literature: Begin writing concise summaries of the main findings, arguments, or key points from each source. Focus on the aspects that are most relevant to your research question. Look for commonalities, patterns, and trends across the literature and synthesize the information to form a coherent narrative.
- Critically analyze the literature: Evaluate the strengths, weaknesses, and limitations of the studies you reviewed. Identify any gaps, inconsistencies, or unresolved issues in the existing literature. Critically assess the methodology, sample size, data analysis, and other relevant aspects of the studies to determine their reliability and validity.
- Structure the literature review chapter: Organize your literature review in a clear and logical manner. Start with an introduction that sets the context and provides an overview of the topic. Then, present the main themes or subtopics you identified, providing a summary and synthesis of the literature within each theme. Use topic sentences and clear transitions to guide the reader through the review.
- Include citations and references: Properly cite all the sources you have used within the literature review chapter. Follow the appropriate citation style guidelines (e.g., APA, MLA, Chicago) specified by your target journal or academic institution. Make sure to create a comprehensive reference list at the end of the chapter, listing all the sources cited.
- Revise and refine: Once you have completed a draft of the literature review chapter, review and revise it for clarity, coherence, and logical flow. Ensure that your arguments and conclusions are supported by the evidence presented in the literature. Seek feedback from peers, mentors, or supervisors to improve the quality of your review.

Remember that the literature review is not merely a summary of existing research but a critical analysis that highlights the significance of your research and the gaps you aim to fill. It should demonstrate your understanding of the field and establish the rationale for your study.

Topics

- Architectural Barriers for disabilities
- Virtual Reality Simulations

Links _ Architectural Barriers for disabilities

1 _ Architectural Barriers to Persons With Disabilities in Businesses in an Urban Community

- Abstract

It is the purpose of this study to determine the frequency of architectural barriers to persons with disabilities in businesses in a small urban community in central Virginia. The survey was conducted by a trained volunteer using a one-page checklist. Only 27% of the businesses had no architectural barriers to individuals with disabilities. The most common architectural barrier for individuals with disabilities was the interference with parking and entrance into the business (65%). Faced with these architectural barriers, all individuals are encouraged to identify the architectural barriers in businesses and to file letters of complaints to the Department of Justice requesting their removal.

- Keywords

Disabled, persons disability, community, frequency of architectural barriers, common barriers, parking, entrance, America.

- Citation

Ahn, H.C., McGovern, E.E., Walk, E.E., Edlich, R.F. (1994) Architectural barriers to persons with disabilities in businesses in an urban community. *The Journal of Burn Care & Rehabilitation*, Volume 15, Issue 2, Pages 176–179, <https://doi.org/10.1097/00004630-199403000-00014>

2 _ Architectural Barriers: a Perspective on Progress

- Abstract

Over the past twenty-five years, laws have been enacted mandating that buildings be designed and constructed to be accessible to persons with handicaps. The implementation of these laws with barrier-free design standards, which also developed in this period, has led to significant process in the involvement of disabled persons in the fabric of American society. Accessible design is currently in an age of implementation. It is apparently on a projected course where "handicapped design" will ultimately be so fully integrated into the creative process that it will be part of "universal design" in which architects and designers maximize the number of users and their experiences in a facility.

- Keywords

Architectural barriers, laws, barrier-free design standards, accessible design, America.

- Citation

Charles D. Goldman, ARCHITECTURAL BARRIERS: A PRESPECTIVE ON PROGRESS, 5 W. New Eng. L. Rev. 465 (1983), <http://digitalcommons.law.wne.edu/lawreview/vol5/iss3/8>

3 _ The perspective of children and youth: How different stakeholders identify architectural barriers for inclusion in schools

- Abstract

Recent inclusive policies are promoting the involvement of individuals with disabilities in identifying

barriers that limit their full participation and inclusion in public spaces. The present two studies explored the contributions provided by different stakeholder groups in the identification of architectural barriers in elementary and secondary schools. In each school, the principal, special education resource teacher and a student independently identified architectural barriers using an observational walkthrough method. The first study consisted of 29 schools where the student evaluator had a physical disability and the second study consisted of 22 schools where the student evaluator did not have a disability. The results of both studies showed that students identified the greatest number of barriers and principals the least. The type and location of identified barriers are explored and the conclusions are examined in relation to person-environment congruence. The results highlight the efficacy of youth involvement and provide support for collaborative assessments that equitably involve all stakeholders in inclusive environmental assessments.

- Keywords

Inclusive environmental assessment, child and youth participation, children with disabilities, architectural barriers, accessibility, schools.

- Citation

Pivik, Jayne. (2010). The perspective of children and youth: How different stakeholders identify architectural barriers for inclusion in schools. *Journal of Environmental Psychology*. 510-517.
https://www.researchgate.net/publication/222824936_The_perspective_of_children_and_youth_How_different_stakeholders_identify_architectural_barriers_for_inclusion_in_schools

Pivik, J. R. (2010). The perspective of children and youth: How different stakeholders identify architectural barriers for inclusion in schools. *Journal of Environmental Psychology*, 30(4), 510–517.
doi:10.1016/j.jenvp.2010.02.005

4 _ Public space without architectural barriers as friendly and accessible for people with disabilities

- Abstract

Accessible public space for people with disabilities is the space where there are no barriers that prevent them from normal functioning in a given place. In this paper, there was collected a number of examples of most common barriers and design guidelines needed to plan or transform space into the accessible one. There was also described type of barriers and factors that affect on the accessibility of the public space.

- Keywords

Universal design, designing for disabled, accessibility, public space, architectural barriers, common barriers examples, design guidelines, plan or transform, type of barriers, factors that affect accessibility.

- Citation

Rawski, K. (2017). Public space without architectural barriers as friendly and accessible for people

Beyond Architectural Barriers: Building a Bridge Between Disability and Universal Design

Abstract

The paper is focused on the evolution of the concept of accessibility, by considering data of the World Health Organization (WHO) and of the Istat (Italian statistical institute). From these data it emerges that the population (worldwide and in Italy) dealing with disability represents an important share of the total. These disabilities are linked not only with disease, but also with other situation due to age, size, language, culture, job, etc. For this reason, this paper analyses how the way of seeing and dealing disability is changed over time, starting from the Italian Standard evolution. Then the action of the WHO is analyzed. The two WHO focus points are: i) disability is a health condition in an unfavorable environment; ii) disability is not a problem of a minority group within a community, but an experience that everyone, in their lifetime, can experience. All of these analyses underlined the importance of the environment influence on life of every person. Finally, the concept of Universal design UD is investigated, highlighting the importance of recognizing and understanding that human beings will have different steps in their abilities throughout their life. The originality of this research is the shifting of the attention also to people normally served by poor services, such as people of small stature, the elderly, pregnant women, parents with children in strollers, people who speak different languages and more.

Keywords

Accessibility, disability, universal design, World Health Organization, architectural barriers, Italy

Citation

Pinna, F., Garau, C., Maltinti, F., Coni, M. (2020). Beyond Architectural Barriers: Building a Bridge Between Disability and Universal Design. In: , et al. Computational Science and Its Applications – ICCSA 2020. ICCSA 2020. Lecture Notes in Computer Science(), vol 12255. Springer, Cham. https://doi.org/10.1007/978-3-030-58820-5_51

Raising Awareness about Accessibility

Abstract

Every citizen has to right to move throughout a city safely and independently. The term accessibility refers this right in built environment mostly for public uses. In the beginning of 20th century, accessibility started from a restricted application but nowadays it became more comprehensive due to a better understanding of physical barriers in the world. According to a recent research, designers are not aware of how architectural barriers restrict accessibility for different users. It should not be forgotten that accessibility for everyone will increase the whole citizens' quality of life. Thus, the paper tries to show importance of raising awareness in design studios for better implementing accessibility for all people. In our urban design studio, a strong relationship has been found between accessible design solutions and students' awareness about physical barriers. The paper concludes that there is an immediate need to elaborate design courses with universal design principles.

Keywords

Accessibility, design curriculum, universal design

Citation

Ayşe Nilay Evcil, Raising Awareness about Accessibility, Procedia - Social and Behavioral Sciences, Volume 47, 2012, Pages 490-494, ISSN 1877-0428. <https://doi.org/10.1016/j.sbspro.2012.06.686>.
(<https://www.sciencedirect.com/science/article/pii/S1877042812024226>)

Wheelchair accessibility to public buildings in Istanbul

Abstract

Background. Accessibility to public environment is the human right and basic need of each citizen and is one of the fundamental considerations for urban planning.

Purpose. The aim of this study is to determine the compliance of public buildings in central business districts (CBD) of Istanbul, Turkey, to wheelchair accessibility to the guidelines of the instrument and identify architectural barriers faced by wheelchair users.

Methods. This is a descriptive study of 26 public buildings in CBD of Istanbul. The instrument used is the adapted Useh, Moyo and Munyonga questionnaire to collect the data from direct observation and measurement. Descriptive statistics of simple percentages and means are used to explain the compliance to the guidelines of the instrument and wheelchair accessibility.

Results. The descriptive survey results indicate that wheelchair users experience many accessibility problems in public environment of the most urbanised city (cultural capital of Europe in 2010) in a developing country.

Conclusion. It is found that the major architectural barrier is the public transportation items with the lowest mean compliance (25%). Beside this, the most compliant to the instrument is entrance to building items with 79% as mean percentage. It is also found that there is an intention to improve accessibility when building construction period is investigated. This article describes the example of the compliance of public buildings accessibility when the country has legislation, but lacking regulations about accessibility for the wheelchair users.

Keywords

Wheelchair accessibility, public buildings, urban planning, design

Citation

A. Nilay Evcil (2009) Wheelchair accessibility to public buildings in Istanbul, Disability and Rehabilitation: Assistive Technology, 4:2, 76-85, <https://doi.org/10.1080/17483100802543247>

8 _ Wheelchair accessibility of public buildings: a review of the literature

- Abstract

Purpose. The purpose of this review was to examine the wheelchair accessibility in public buildings and discuss the role of professional in this practice area.

Method. Of the 85 originally identified publications from a search of major electronic bibliographic databases, 12 studies relating to wheelchair accessibility in public buildings were selected. The compliance rates with wheelchair accessibility in different areas were summarised.

Results. No study reported 100% wheelchair accessibility despite the enforcement of existing laws and regulations. Parking had the lowest compliance rate among all facilities in terms of accessibility, while entrances had the highest.

Conclusions. A global review is needed of both new and old buildings regarding wheelchair accessibility. Professional in this practice area has an important role to play in advocating wheelchair accessibility and assisting wheelchair users to participate fully in all areas of the community.

- Keywords

Wheelchair use, barrier-free environment, community, public buildings, literature review, parking, plan or transform.

- Citations

Nandana Welage & Karen P. Y. Liu (2011) Wheelchair accessibility of public buildings: a review of the literature, *Disability and Rehabilitation: Assistive Technology*, 6:1, 1-9, <https://doi.org/10.3109/1748f3107.2010.522680>

Disability Law in Germany: An Overview of Employment, Education and Access Rights

Abstract

Under German law, people with disabilities are entitled to help and assistance in order to avert, eliminate or improve their disability. The general goal is to overcome, as much as possible, the disability's effects and to enable the disabled to participate in all areas of society, especially in the labor market and in community life. The Federal Government is obliged to a barrier-free design and construction of public buildings, streets, etc. and to provide barrier-free access to communication, especially in the field of administrative Internet sites, official forms and notifications. In the area of public transportation, all facilities and means of transportation (bus, train, aircraft) are also required to be barrier-free. The same applies to restaurants.

Keywords

Citation

Kock, M. (2004). Disability Law in Germany: An Overview of Employment, Education and Access Rights. *German Law Journal*, 5(11), 1373-1392. <https://doi.org/10.1017/S2071832200013286>

What about the people? Developing measures of perceived accessibility from case studies in Germany and the UK

Abstract

As a primary objective in transport planning urban neighbourhood accessibility plays an essential role in the sustainable transformation of cities and their infrastructure. In most studies, accessibility is objectively measured using aggregate travel time or generalised costs as an indicator of the separation of people from places. However, this approach does not reflect perceptions of residents, which ultimately shape mobility decisions and represent the “lived reality” of accessibility. This paper addresses this research gap, adding to a growing evidence base on understanding the relationship between perceived and objective measures of accessibility, and discusses opportunities for incorporating perceptions into measures of accessibility. We offer suggestions for how and why individual perceptions of accessibility differ from objective measures using data from Germany and the UK.

Keywords

Perceived accessibility, urban mobility, comparative research, sustainable access.

Citation

Anna-Lena van der Vlugt, Angela Curl & Dirk Wittowsky (2019) What about the people? Developing measures of perceived accessibility from case studies in Germany and the UK, *Applied Mobilities*, 4:2, 142-162, <https://doi.org/10.1080/23800127.2019.1573450>

22 _ Evaluation of building use scenarios by crowd simulations and immersive virtual environments: a case study

- Abstract

Virtual reality (VR) is becoming common in the AEC/FM industry, closely linked to BIM implementation. VR tools can be used to anticipate operational issues, simulating them in a virtual prototype since early design. The paper investigates such a topic in relation to access, space and use performance of an existing hospital facility. A case study has been developed considering a pavilion where both medical and food spaces are located, causing a clash between flows of end-users in critical time-slots. Crowd simulations and immersive virtual environments have been tested as occupancy evaluation tools. Post-occupancy evaluation (POE) data have been translated into a dynamic simulation of the existing occupancy conditions within the BIModel of the pavilion and considering various profiles of end-users. Subsequently, both the BIModel and the crowd simulation have been imported into a game engine to be visualised and experienced in a VR headset, switching from the analysis of flows to the perspective of end-users (i.e. able-bodied users, person in a wheelchair, visually-impaired person). The use of VR enables a clear visualisation and communication of the existing conditions. Moreover, POE data translated into a dynamic simulation of the building use scenario could be applied for the pre occupancy evaluation of internal layout reconfigurations. Finally, the combined use of crowd simulation and immersive VR enables the users to perceive crowding in the occupancy evaluation and adds the user experience as design input, representing an innovative approach that goes beyond traditional resources such as personal experience and regulations.

- Keywords

Occupancy evaluation, virtual reality, crowd simulation, immersive virtual environment, building performance.

- Citations

Mastrolembo Ventura, S., Hilfert, T., Archetti, M., Rizzi, M., Spezia, A., Tagliabue, L.C., Oliveri, E., Ciribini, A.L.C. (2018). Evaluation of Building Use Scenarios by Crowd Simulations and Immersive Virtual Environments: A Case Study. <https://core.ac.uk/download/pdf/162433282.pdf>

23 _ The capabilities of people with cognitive disabilities

- Abstract

People with cognitive disabilities are equal citizens, and law ought to show respect for them as full equals. To do so, law must provide such people with equal entitlements to medical care, housing, and other economic needs. But law must also go further, providing people with disabilities truly equal access to education, even when that is costly and involves considerable change in current methods of instruction. The central theme of this essay is what is required in order to give such people political and civil rights on a basis of genuine equality.

- Keywords

Capabilities, civil rights, cognitive disability, constitutional law, economic entitlements, education, equality, human dignity, justice, mental dis-ability, political entitlements, Rawls, social entitlements.

- Citations

Nussbaum, M. (2009), The capabilities of people with cognitive disabilities. *Metaphilosophy*, 40: 331-351. <https://doi.org/10.1111/j.1467-9973.2009.01606.x>

Topics

Terminology

The common access pathways are defined as routes. [8]

Ensuring inclusion requires compatibility between the person or group's functional capacity and their environment, in other words person-environment congruence. Person-environment congruence is generally defined as the degree of fit between an individual's needs, capabilities and aspirations and the resources, demands and opportunities provided by the environment. [3]

Elementary ergonomic design aims were defined as: a technical compensation for inability to normal function in society for disabled people, eliminating any external barriers (e.g. architectural) that hinder the daily existence of people with disabilities. [4]

Architectural barrier according to universal design: any object in a public space that causes mobility problems or reduces access for any group of users (disabled, elderly, low and high persons, travelers, people with wheelchairs, pregnant women, cyclists etc.). [4]

Disability concept

Disability concept

An increasing number of people with disabilities is a significant problem. It has been noted that from year to year number of disabled people in the whole world are rising up. There are many factors that may be responsible for this situation. Among these are civilizational diseases, road and sport accidents, aging society, and psychological burden related to stress. According to World Health Organization disabilities is an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations. Thus disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives [4]

Central Statistical Office of Poland (GUS) based on National Census of Population and Housing 2011 estimates, that in Poland about 12,2% people from the entire population have various dysfunctions, that is about 4,7 million people . Of course, some of these dysfunctions do not interfere so much with normal functioning and are not conducive to the spread the phenomenon of social exclusion. Despite this, people responsible for spatial planning should include disabled people in designing process. [4]

Type of disabilities

Biophysical impairments (cerebral palsy, spina bifida, cystic fibrosis, muscular dystrophy, paralysis, arthritis or rheumatism), with one student identified as "legally blind". The majority used assistive devices (manual wheelchair, electric wheelchair or crutches/walker). [3]

In order to better understand needs of people with disabilities, the knowledge about the types of their diseases is useful. The biggest problems with moving around the public space have people with: vision disabilities (blind, visually impaired), physical disabilities (moving in wheelchairs, chronic diseases of internal organs), hearing disabilities (deaf) and mental disabilities (cerebral palsy, mentally retarded). [4]

Common barriers / types of barriers

three major areas of activities that were affected, namely parking and entrances, goods and services and restrooms. A later study also singled out parking and entrances. [8]

wheelchair accessibility in different areas of public buildings, and most assessed parking, routes, ramps, entrances, restrooms, phones, water fountains and elevators, which are the facilities most commonly used by visitors, including both wheelchair users and the general population. [8]

parking facilities, which were found to have the least degree of compliance with wheelchair accessibility requirements. [8]

The compliance rates with regard to wheelchair routes (including the width of route turns and curbs) ranged. [8]

Accessibility to water fountains. [8]

food courts and dressing rooms in shopping centres. [8]

restaurant accessibility by examining table height and knee clearance. [8]

Common barriers / types of barriers

accessibility of grocery and convenience stores by assessing the height of racks and the width of aisles. [8]

Five major areas have been identified as important areas of accessibility, namely parking, routes, ramps, entrances and restrooms. [8]

Parking lots have no assigned parking spaces for individuals with disabilities. Van-accessible parking places are a rarity. [1]

Sidewalks without a curbcut, making it impossible to cross the street. [1]

Access to buildings. [1]

Stairs without an accessible ramp. [1]

The aisles in the stores are so narrow that they prevent access to an individual in a wheelchair. [1]

The products sold in stores are positioned on shelves that cannot be reached by individuals with disabilities. [1]

check-out aisles in the stores are usually not accessible. [1]

Public restrooms for individuals in wheelchairs are often not accessible. Without an elevated toilet and grab bars, persons with disabilities cannot transfer to the toilet without assistance. [1]

The most common architectural barrier for individuals with disabilities was the interference with parking and entrance into the business (65%). [1]

The most common architectural barrier for individual with disabilities was interference with parking and entrance (65%), followed by those in goods and services (40%), and then by those in restrooms (42%). (listed in order of priority according to priority) [1]

Title III of the ADA has established the following three suggested priorities for barrier removal. First, remove barriers from parking areas, sidewalks, and entrances to the public accommodations so that a person with a disability can get through the door. Second, remove barriers where goods and services are provided. Third, remove barriers to restroom facilities when they are open to the public. [1]

A series of focus group sessions with 15 students with mobility impairments, asking them to identify the barriers at their schools. The students identified accessibility barriers associated with doors, ramps, hallways, elevators, classrooms, washrooms, playgrounds and fixtures such as lockers and water fountains. [3]

Barriers existing in public space may be related to communication paths, overcoming height differences, entrances to the buildings, equipment elements and the infrastructures associated to transport. [...]

Most commonly encountered barriers on the communication paths:

- bad technical condition,
- unhardened surface,
- uneven or too slip surface,

- too narrow sidewalks,
- lack of tactile paving for blind people.

Guidelines for removing these barriers:

- main pedestrian routes should be rectilinear and changes of its directions should be as close as it possible to the right angle;
 - the longitudinal slope should not exceed 6% (to provide more comfort for people moving in wheelchair even 5%), and cross slope maximum 2%
 - the path width should be not less than 150 cm, (its allowing comfort manoeuvring of the wheelchair), it can be reduced to 120 cm, if the length of this part does not exceed 20 m;
 - the width of main avenues with bigger traffic on both sides should be at least 200 cm to provide comfortable passing by [Kowalski 2011];
 - the surface must be flat and rough enough to eliminate the possibility of stumbling or slipping [Czarnecki and Siemiński 2004];
 - additional elements on surfaces – tactile paving, that have a different factures depending on its functions (attention, directional and warning) should be provided for the blind people in strategic places;
 - it is recommended to use durable materials to provide good technical condition
- Most commonly encountered barriers related to overcoming height differences:

- lack of ramps or elevators at the stairs,
- too steep wheelchair ramps,
- unmarked lower and upper edges of stairs, no handrail at the stairs,
- construction of steps in areas with a slight difference in terrain,
- bad technical condition

Guidelines for removing these barriers:

- instead of designing stairs, a long smooth slopes should be planned when is impossible, when it is not, in addition to the stairs should be also included the ramps;
- usable width of the wheelchair ramp must be at least of 120 cm;
- if it is necessary to use longer ramps, they should be divided into shorter sections (single section can-not exceed 9 m) utilizing landings, that cannot be shorter than 1.4 m, (in case of change direction, there should be ensured movement area with minimum dimensions of 1.5×1.5 m);
- at the end and the beginning of the ramp, it has to be placed flat manoeuvring area;
- on both sides of the ramp should be designed a handrail at heights of 75 cm and 90 cm, parallel to the surface [Budny 2009];
- allowable slope of the ramp depends of the height differences and its location (outdoor or indoor);
- single steps should be avoided; in case of more than 10 steps in flight of stairs, there must be applied landings;
- the most comfortable steps are between 12 to 15 cm high and depth about 35 cm;
- there is no need to design railings, when the height difference is less than 0,5 m;
- flight of stairs should be at least of 1,2 m, and the railings should be attached at of 90 cm, (pair of railings at 75 and 90 cm is not obligatory).
- the first and last step should be marked with a contrasting stripe;
- it is recommended to design 0,5 m of tactile pavement (warning field) 0,6÷0,8 m before and after flight of stairs

Most commonly encountered barriers related to space equipment:

- placement of elements within the sidewalks gauge,

- insufficient maneuvering space nearby the devices or lack of that,
- badly designed height of usable elements (too low or too high),
- wrong placed or too weak lighting

Guidelines for removing these barriers:

- equipment should be grouped together and form rows, that are parallel to the main axis of the path [NDA 2002];
- designed elements should not reduce the usable width of the path;
- information boards should be placed outside the paths and follow the rules of safe arrangement;
- parking meters should be placed to be available for people with disabilities and its nearest space should be enough for manoeuvring;
- functional parts of devices cannot be higher than arm of person in wheelchair can reach what is estimated as 130 cm maximally;
- important informations at the equipment in public space should be also written in braille language and the space before it should be marked by tactile pavement (field of attention);
- fountains must be separated from the pedestrian parts with utilizing belt of greenery or through the use of warning components

Most commonly encountered barriers related to infrastructures associated to transport:

- narrow bus stops;
- bus stops with unpaved platforms;
- badly designed bus bays (access to the edge of the platform is impossible); lack low curbs;
- unspecified passage through the road; □ no warning tactile fields at the pedestrian crossings;
- pedestrian crossings without refuge islands on two-way multi-lane roads;
- lack of parking places dedicated to the disabled

Guidelines for removing these barriers:

- car parks should contain wider (3,6 m) parking places for disabled (their amount depends on the amount of all places);
- curb higher than 2 cm, should contain ramp with a maximally 5% slope;
- blind and visually impaired people need tactile warning fields before pedestrian crossings in contrasting colour and located along the street with at least 0,5 m width;
- traffic light should make audible signal and include buttons that activate green light located on height from 0,9 to 1,1 m;
- bus stop shed (with depth about 150–180 cm) should be distant from the warning tactile paving min. 80 cm to allow passage of wheelchair;
- tactile warning lane over the entire length of the platform should be 30 or 40 cm wide at a distance of 80 cm from the edge of the platform;
- it is recommended to raise the platform to a height of 20cm to make easier get in the bus for wheel-chair users;
- the edge of the platform should be marked by contrast strip (yellow recommended) with a width of 7 or 10 cm on the entire platform length; [4] |

| The existence of barriers in public space also depends on the proper management of given space. Well planned accessibility may be lost over time due to lack of maintenance of key components. Seasons can also have influence of the space accessibility. Bad weather conditions can contribute to creation of new barriers, especially in the winter. To name a few, bad snow shoveling, snowdrifts and icy surfaces can be the big obstacles for disabled. [4] |

Wheelchair accessibility to public buildings is often regulated by the legal system. An example of this would be the Americans with Disabilities Act (ADA) of 1990, which was an outcome of the independent living movement and the disability rights movement. In 1993, the United Nations General Assembly adopted standard rules to equalise opportunities for persons with disabilities. Rule 5 specifically targets accessibility, declaring that 'states should introduce programmes of action to make the physical environment accessible'. In addition, individual governments have taken steps to ensure accessibility for disabled persons, and a gradual reduction in architectural barriers has occurred as a result. However, difficulties still remain for wheelchair users in using public building facilities throughout the world. [8]

Ramps are an important element of building accessibility and their absence obviously makes it much harder for wheelchair users to enter buildings and perform required activities. A ramp slope should have a 1:12 gradient for independent wheelchair propelling, and a level landing area at both the top and bottom is essential. [8]

accessibility to building entrances [...] it was mentioned that doors were often too heavy, or in the case of double doors, the width of one leaf was less than the ideal width of 32 inches. [8]

accessibility to restrooms [...] The major problems were narrow doorways, narrow spaces for wheelchair maneuvering, lack of grab bars or reachable hand driers, and lack of designated restrooms. [8]

accessibility to elevators for wheelchair users [...] freight elevators, so their locations were not convenient for wheelchair users or passengers in general. These elevators usually had several unsatisfactory features; for example, they frequently had heavy manual doors, and the height of the controls, the entrances, and the levelling of the elevator to the outside area were often not suitable for wheelchair users. With advances in technology, features suitable for wheelchair users can be built in, such as automatic doors and spacious room inside the elevators. [8]

ADA criteria of public telephone. However, wheelchair accessibility to public telephone facilities is less essential today given the widespread use of cellular telephones. [8]

Americans with Disabilities Act (ADA) is the World's first comprehensive civil rights legislation for people with disabilities, and it was a historic benchmark and milestone in America's commitment to full and equal opportunity of all of its citizens. Title III (of the ADA) forbids discrimination by public accommodations and services, affecting all the business in our country. [...] As a public accommodation, the business must not discriminate against a person with a disability in the goods, services, facilities, and accommodations provided by the business. [1]

The ADA requires the business to remove architectural barriers to access when it is "readily achievable" to do so. The ADA defines readily achievable as easily accomplishable and able to be carried out without much difficulty or expense. The standard does not require business to remove barriers when extensive restructuring or burdensome expense is involved. Requires barrier removal for a particular business will depend on its financial resources and no other resources. The readily achievable standard is intended to be a flexible one on a case-by-case basis. [1]

On the basis of Polish law and literature related to universal design and accessibility standards, there was de-fined architectural barriers in public space and types of them. There were also collected a number of guidelines for design new or transform already existing places in public space into more accessible for the people with disabilities. These guidelines were divided by their type and they concern parameters related to: communication paths, height differences, space equipment, infrastructure associated to transport. [4]

Need of ensuring equality to all the people, including those with disabilities is mentions in Polish Constitution (Art. 30, 32, 68 and 69) and also the international normalizations. In 1982 „World Programme of Action Concerning Disabled Persons” was formulated and adopted by resolution of United Nations. This programme assumes meeting three major objectives: Prevention, Rehabilitation, Equalization of opportunities. It was granted that tasks from these areas should be realized in many levels, involving many fields of knowl-edge, in particular technical, medical and humanistic and also in cooperation with different professionals like architects or town planners. [4]

At least where primary and secondary education are concerned, adequacy does appear to require something close to equality, or at least a very high minimum (perhaps allowing for divergences in aspects of education that are not firmly linked to basic opportunity and political participation). Whether higher education and nonessential health care are matters in which we may accept unequal shares as compatible with the threshold of adequacy, remains a question that societies will have to hammer out.[23]

Education [for people with cognitive disabilities] is somewhat more complicated and controversial, since equal respect recommends policies that are very expensive. Here, however, law has gotten in ahead of us, and the analysis I recommend is already not just statutory law, under the Individuals with Disabilities Education Act (IDEA), but is also supported by constitutional law [in the United States]. [...]

At least where primary and secondary education are concerned, adequacy does appear to require something close to equality, or at least a very high minimum (perhaps allowing for divergences in aspects of education that are not firmly linked to basic opportunity and political participation). Whether higher education and nonessential health care are matters in which we may accept unequal shares as compatible with the threshold of adequacy, remains a question that societies will have to hammer out. [...] The guiding idea of the Disabilities Education Act (IDEA) is that children with disabilities are individuals, equal in dignity to “normal” children, and that, in consequence, education should be based on a careful individualized consideration of a child’s educational needs. I’ve said that equal protection and equal respect do not require equality of educational outcomes. In that sense, the approach in education has a good deal in common with the approach in the area of mobility, and thus it might seem to be an adequacy approach, not an equality approach. The whole point of the approach, however, is to ensure that no special disadvantages accrue to children with disabilities in virtue of their disability. They are equally placed in the education process, and equally supported—which, in their case, requires a lot of affirmative measures and extra expense. After that, like all children, they will achieve at different rates and attain different levels. So the equality is in the concern, and the strenuous requirements it imposes. [23]

Participation in barriers identification

Participation in barriers identification

Students with disabilities reported more barriers in their schools than either their principal or the SERT. [3]

Unexpected result of students without disabilities reporting more barriers than either their principal or SERT, the data was further explored to determine the type of barrier (mobility, visual, hearing). [...] The students who had disabilities (where most had a mobility disability) reported the greatest number of mobility barriers; For example, many described items not identified by any other group, such as locker hooks which are too high, inaccessible counters or the fear of being trapped during a fire, need for visual strips on stairs for those with balance problems. [3]

The plant supervisors were not evaluating, and thus missing, barriers associated with classrooms, passageways, stairs, water fountains, libraries, science labs, music rooms and recreational facilities. [3]

In their search for architectural barriers in schools, students, SERTS and principals saw the same environments differently. This

finding provides support for the theory that one's role in the environment may be useful in the examination of differential perception. [...] Of particular interest is the greater number of barriers identified by the students in both studies compared to the other two stakeholder groups. These studies clearly highlight the capabilities of youth in conducting an inclusive environmental assessment. [...] Further, these two studies confirm previous findings that youth provide a unique perspective in evaluating environments compared to adults. [3]

The fact that students significantly identified the greatest number of barriers for recreational facilities reinforces the importance of social and recreational inclusion as a valued factor for inclusive assessments. More surprising was the significant difference in the number of

identified barriers between students without disabilities and their principals and SERTS. Possible explanations include: 1) students routinely visit more areas of the school than the principal or SERT and thus have greater familiarity; 2) the students paid more attention to the task; 3) students were less concerned about a negative evaluation; or, 4) the students had greater disability awareness. The fact that the principals mostly identified barriers near their offices (e.g., entranceway and front door) and students from both studies identified more barriers in the classrooms, libraries and recreational facilities, suggests that familiarity as a result of motoric exposure may have played a role. [3]

It was believed that principals would identify more barriers in those areas that related to potential litigation. [...] SERTs appeared to focus on these barriers instead of those associated with learning environments such as classrooms and libraries. This suggests that the role of SERTs focused more on physical inclusion and less on educational support. [3]

The results of these studies support collaborative environmental assessment methods and inclusive planning efforts. Differences

between stakeholders in the same environment were found for the total number of barriers identified and in some cases, where they were located. With principals identifying the least number of barriers in the typical walkthrough format and students identifying barriers not reviewed by plant supervisors, the current system is lacking. A collaborative assessment

method would provide a more comprehensive evaluation by incorporating feedback from all relevant stakeholders within the environment. [...] User involvement in design planning, results in greater satisfaction with the environment by meeting the user's needs and values and providing a sense of mastery and competence. [3] |

| The possibility to support user-centred design processes and stakeholder engagement by immersive technology has been considered. [...] Immersive VR could be an effective tool to analyse the accessibility of building spaces, going beyond codes, regulations and computable parameters and implementing the dynamic simulation of how the building is/will be used. [...] Immersive VR could be used as a training tool to learn how a person with disabilities moves and acts within the space. [...] The combined use of crowd simulation and immersive VR, in fact, enables the users to perceive crowding in the occupancy evaluation and adds the user experience as a design input, representing an innovative approach that goes beyond traditional resources such as personal experience and regulations. This application may support the validation of design proposals, the evaluation of current in-use scenarios and a better understanding of how end-users perceive the space and its performance in meeting their needs [22] |

Accessibility concept / evolution / goals

achieve full social participation. [8]

users' participation in community activities [8]

Four studies found that recently constructed buildings were more compliant with wheelchair accessibility requirements than were older buildings. [8]

All these four studies showed the trend of increasing compliance rate when buildings were constructed in recent years. [8]

It was encouraging to see that action was taken by building management when they were notified of the identified deficiencies: 25% of the buildings underwent renovation based on the studies' suggestions and recommendations. Thus, professional in this practice area and/or designers such as architects or urban planners can play a key role in advocating the importance of a barrier-free environment to the lives of people with disabilities and thus help to bring about change. [8]

With the enforcement of international disability acts, public buildings are undergoing gradual renovations to become more wheelchair accessible. [...] Nevertheless, the findings of this review show that architectural barriers to wheelchair users persist in public buildings despite wheelchair accessibility being a legal requirement in many countries. [...] enforced accessibility guidelines would be necessary to ensure that wheelchair users have the opportunity for social integration and access to community resources. These areas are essential for wheelchair users to be able to enter buildings and participate in required activities [8]

Community integration involves multiple concerns, including environmental, psychological and social factors. In terms of environmental factors, restrictions on mobility may be the most common way of handicapping individuals with disabilities. To create a barrier-free environment is not only important for wheelchair users but also for other people with disabilities, as well as the elderly population, pregnant women and mothers with infants. [8]

Accessibility concept / evolution / goals

People with disabilities have been faced with restrictions and limitations, subjected to a history of purposeful unequal treatment, and relegated to a position of political powerlessness in our society. Our nation's (USA) proper goals are to ensure quality of opportunity, full participation, independent living, and economic self-sufficiency for persons with disabilities. The law itself notes that the continuing existence of unfair and unnecessary discrimination and prejudice denies people with disabilities the opportunity to compete on an equal basis and to pursue those opportunities for which our free society is justifiably famous. This denial costs the United States billions of dollars in unnecessary expenses, resulting in dependency and nonproductivity. The purpose of the Americans with Disabilities Act is to provide clear and comprehensive national mandate for the elimination of discrimination for individuals with disabilities. [1]

Accessibility Concept Evolution

Accessible design is currently in an age of implementation. It is apparently on a projected course where "handicapped design" will ultimately be so fully integrated into the creative process that it will be part of "universal design" in which architects and designers maximize the number of users and their experiences in a facility. [2]

Accessibility awareness

What is Accessibility

The term 'accessibility' refers to the degree to which an environment (e.g., a site, facility, workplace, service or programme) can be approached, entered, operated in, or used safely and with dignity by people with disabilities. [8]

The United Nations (1993) defines accessibility is an "equalization of opportunities in all spheres of society" (5th Standard Rule on the Equalization of Opportunities for Persons with Disabilities). The Canadian Standards Association (1995) defines accessibility as "a program, activity, meeting, hearing, or other event or process that is readily usable by an individual, regardless of his or her abilities. When used in reference to a building or facility, it means that a facility can be approached, entered and used by any individual, regardless of his or her abilities". For the purposes of the present studies, accessibility is defined as "the absence of barriers or anything that prevents a person with a disability from fully participating in all aspects of society because of his or her disability, including a physical barrier, an architectural barrier, an information or communications barrier, an attitudinal barrier, a technological barrier, a policy or a practice" (Ontarians with Disabilities Act, Ministry of Citizenship, 2001). Relatedly, environmental barriers refer to obstacles impacting participation and activity by individuals with disabilities in physical or natural spaces. [3]

Accessible public space for people with disabilities is the space where there are no barriers that prevent them from normal functioning in a given place. [4]

Accessibility impact

Access to public buildings is important for people with disabilities as it could enhance their active participation in the community and allow them to contribute both socially and economically. [8]

Accessibility impact

Architectural barriers are discriminatory in that they deny qualified persons their most basic of rights: access to and participation in society. Accessibility permeates all other aspects of disabled persons' civil rights. Without access, rights to equal employment opportunity, rights to be "abroad in the land," and the full panoply of protections and duties can be rendered meaningless. [2]

I.M. Pei notes the need to go beyond mere access: "Spatial relationships need to be experienced. Persons with disabilities must be

able to enjoy the psychological aspects of a structure, not only the individual points or planes within it. This is a concept that will develop over the next few years. [2]

Inaccessible schools are a particularly salient issue for children with disabilities, considering the amount of time spent in these environments. [...] Schools that have students with disabilities are still riddled with accessibility barriers and stigmatizing attitudes by others [3]

A biopsychosocial conceptualization of health highlights the role of the environment as a crucial determinant in functioning and development; where access restrictions can have a negative impact. [3]

Architectural barriers have very important influence to life quality of the people with disabilities. In many cases, the existence of such barriers hinders or even prevents them from using public services. [4]

Accessibility measure/evaluation

It is commonly quantified using the percentage of compliance, which is calculated as the number of facilities complying with wheelchair accessibility requirements over the total number of facilities measured. [8]

Inclusive environmental assessments use a variety of methods to identify barriers to accessibility and participation, including:

objective checklists, subjective assessments such as questionnaires, surveys, focus groups or interviews of stakeholders or a process called post-occupancy evaluation. [3] |

| subjective assessment tool is The Facilitators and Barriers Survey [...] Post-occupancy evaluations [...] One popular method for direct observation is the "walkthrough method" which involves walking through the environment and noting those elements which contravene building codes, association standards or users' needs. [...] Objective assessments can provide a level of standardization across different spaces, however, the evaluation is static and may miss unique elements specific to that space (that are not included on the checklist). Subjective assessments typically include feedback from relevant stakeholders; however, the information is often retrospective and dependent on recall. Post-occupancy evaluations, while extensive, can be costly and timeconsuming, with the conclusions usually based on the perspective of the architect or planning professional. [3] |

| The subjective barrier assessment instrument simulated the typical method used for assessing barriers within schools. Namely, participants were instructed to walk through their school and list all accessibility barriers noticed. The given definition of an accessibility barrier was "things which stop or make it difficult for a person with a disability from doing what everybody else can or cause a person to be treated differently because of a disability. [...] Scoring consisted of recording the number of barriers identified in

the following categories: entranceway, ramps, doors, passageways, washrooms, signage and safety, water fountains, elevators, classrooms, stairs, libraries, recreational facilities, and other, as well as the total number of barriers found per school. An objective checklist was used as a template to determine if an item was a barrier. [3] |

| CEs have highlighted the possibility to experience building spaces from the perspective of the endusers as positive input in the decision-making process. [22] |

Universal Design

Design to accommodate persons with disabilities was and has continued to be primarily conceptualized for the ambulatory-impaired person, particularly one in a wheelchair. An emerging theme is that of universal design. There is a recognition that design which is functional for persons with handicaps is also utilitarian for the elderly, the very young, and the temporarily disabled. Curb cuts and ramps serve baby strollers as well as wheelchairs and serve as channels for pedestrians. The Handicapped Affairs Office of San Antonio has found that fifty-six percent of the community benefits from barrier free design. [...] There is a growing awareness that disability does not denote inability, that disabled persons are users rather than abusers, and that the individual with a disability pays taxes as does any other citizen. [...] Persons with disabilities are increasingly participating in the design process, bringing unprecedented firsthand knowledge. [...] These groups attest to the benefit of having disability experienced groups participate in the design process. [2]

Congressman Paul Simon, chairman of the House of Representatives Post Secondary Education Subcommittee, has observed the change in attitudes in the higher education community. Representative Simon notes that there is a "recognition of the reality of the need for accessibility. He believes that to adapt to this change of attitude, architects need to become creatively realistic in devising access changes. [2]

Itzhak Perlman, a most creative musician, believes that with rich imagination, aesthetics and accessibility can be blended. Accessibility is compatible with other design considerations. [2]

Consumers and their organizations are moving to protect their hard-fought gains, fearful that the economy will be used as an excuse by those unfamiliar with or opposed to accessibility. This movement has put a premium on the issuance of a clear, uniform standard for accessibility that can be easily understood and implemented. As understanding increases, the costs of implementation decrease because errors are avoided with the use of standard design practice. [...] Architect Ron Mace has a similar perspective, recognizing the need for a clear uniform standard that can be supported and then implemented. A clear uniform standard will be assimilated into accepted architectural practice. Accessibility specifications that are part of a universal design standard will be implemented readily because the design features will be available on a

mass produced, rather than special effects, basis. [...] A true uniform standard will catalyze more consistent design practice and, in turn, greater voluntary compliance. [2]

As more persons with different disabilities enter the mainstream, technology will be challenged to meet their needs. The focus will be on a greater number of people experiencing a building and a recognition of the practicality of universal design, which benefits all citizens for the same cost. [2]

Universal Design

Department of Rehabilitation, is seeking to implement universal design. The designs will be functional for the able-bodied and disabled. The grade level entrance that serves the mobility impaired also serves the baby carriage brigade. The design features add nominal cost to the structure, which has a longer useful life for its occupant. Lamentably, the older people get, the less able-bodied they become. The adaptability features enable people to make accommodations as disabilities occur. The features are aesthetically pleasing and make the house more marketable as it is suitable for the total range of buyers, not only those who are able-bodied. [2]

A critic recently wrote: "Each and every building is a product of numerous forces--economic, social, cultural, political, functional, and aesthetic-and must be evaluated in terms of how well it has responded to all of these forces. There is little doubt that handicapped persons and barrier free design are forces which are now and should continue to be significant factors in the totality of building design. As the building design process evolves towards greater accessibility, legal issues will inevitably arise. [2]

Every person have the same right to use the public space, that is why barrier-free design is so important. However, the individual elements of space for one disabled can be an obstacle, and for others not. [4]

Universal design based on seven principles: 1. Equitable use (providing the same means of use for all users), 2. Flexibility in use (providing a choice in methods of use), 3. Simple and intuitive (eliminating unnecessary complexity and providing consistency with user expectations and intuition), 4. Perceptible information (using different modes for additional presentation of essential information and increasing its legibility), 5. Tolerance for error (arranging elements of design to minimize risk and errors and providing fail safe features), 6. Low physical effort (allowing user to maintain a neutral body position with minimum fatigue while using the design), 7. Size and space for approach and use (independently from user's body size or mobility provide adequate access, reach and use). [4]

"takes into consideration especially the needs of persons with visual impairments, blind persons, persons with hearing impairments (deafness, late-onset deafness, hard of hearing) or with motor impairments, and persons using mobility aids and wheelchairs. Other groups, such as persons of short or tall stature, persons with cognitive impairments, older persons, children, and persons with baby carriages or luggage, will benefit from some of the requirements of this standard. [Guideline: Accessibility in Building Design, pag. 51]

Participation in Design

Studies by the National League of Cities and the United States General Accounting Office have led to an acceptance of the proposition that accessibility features cost less than one percent, often less than one-half of one percent of the cost of new construction. Alteration projects can be more expensive, depending on the exact nature of the work involved. [...] The phasing-in of accessibility has been found to ease the cost burden. [2]

Questions

- Number of wheelchair users/blind/deaf/... in Europe/Germany/Baden-Württemberg
[cfr. 1.6 million wheelchair users live in the community in the USA. This means

that approximately 1 in every 200 community dwellers require the use of a wheelchair. Although no exact figures exist for developing countries, the number of wheelchair users may be similar to or even exceed that of the USA.]

Reading Progress

Number	Title	Obtained	Read
1	Architectural Barriers to Persons with Disabilities in Businesses in an Urban Community	Yes	Yes
2	Architectural Barriers: a Perspective on Progress	Yes	Yes
3	The perspective of children and youth: How different stakeholders identify architectural barriers for inclusion in schools	Yes	No
4	Public space without architectural barriers as friendly and accessible for people with disabilities	Yes	Yes
5		Yes	No
6		Yes	No
7		Yes	No
8	Wheelchair accessibility of public buildings: a review of the literature	Yes	Yes

Links _ Virtual Reality Simulations

Abstract

Keywords

Citation