INCLUSIVE DESIGN AND PRACTICES IN EDUCATION: A CONCEPTUAL LITERATURE REVIEW

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Abstract

Public spaces of the city, where the social relations of the individuals of society take place intensively, have an important role in urban development. In addition to the cultural, economic and technological conditions in constant change and development, the understanding, necessity and usage of public space, are also affected. Along with these changing conditions, new requirements and problems arise such as the inclusivity of these spaces.

Augmenting the quality of spaces by enhancing the inclusivity and hence the quality of university campuses as a public space and spreading this philosophy throughout the whole society in professional life by ensuring the awareness is settled on university students as the main campus users who will provide the development of society, is an approach that will sustain the development of societies&cities.

The aim of this study is to review the literature in a wide range about conceptual of inclusive design in university campuses. In the meantime identifying the problems faced by users in university campuses, exploring the approaches and examples that will enable all users to access campus spaces and services will be handled. In addition, to use the approaches and to develope solutions to the problems will be encountered. In this study literature review based on inclusive design concepts and university design concepts will be done.

**This study was produced from Sahika Ozdemir's doctoral thesis study.

Keywords: Inclusive design, Accessibility, University campus design, Campus climate, Inclusive university campuses

1 INTRODUCTION

Starting from inclusive design, which was launched in America early 1980s and spreading in various countries around the world, every individual of society should be able to benefit from all sources of society equally.

Architects are concerned with the availability of the built environment created by designers, so that individuals can benefit from education, employment, health care and social life. The lack of design results from attempting to overcome problems arising from planning and structural detail deficiencies or errors with technological solutions. Also, if the technological solutions are private, the person who does not have the relevant device will be left out of the solution.

In particular, while the public space is gaining in importance, and with the measures taken by the designer during the planning phase, both more economical and all-inclusive solutions will be emerged.

2 METHODOLOGY

The aim of this study is to review the literature in a wide range about conceptual of inclusive design in university campuses. This paper contains Abstract, Introduction, Methodology, Campus Climate, University Campuses In The Context Of Inclusiveness and Conclusion sections. In this study literature review based on inclusive design concepts and university design concepts will be done.

3 CAMPUS CLIMATE

Three conditions for successful campus design are respectively;

- Common vision: Before the master plan is identified, close dialogue should be established with the people who will be resident there in the future and with the campus neighbours to determine the common vision.
- Complementary program: Designing spaces and supplementary programs for interdisciplinary discourses in campus design is the second key factor. Campus means opening up to different target groups such as "industry partners" who can contribute to create an academic campus and produce their programs. Thus, students and society become part of an institutionalized campus.
- Integrated sustainable concept: Design sustainability, designing architectural master plan and financial strategies is a must for a successful project [1].

Schmitt's planning approach conveys the characteristics of Christiaanse's future campus types, which is thought to be parallel to the resulting campus typology [1], "It is important to create new campus designs that create vibrant and sustainable urban spaces, rather than single function university centers that are both in the public arena and the private arena. In this context, it is necessary to analyze the examples from many places in the world and to analyze the current tendencies of the campus design. In a world where campus design is increasingly important, being able to create a long-lasting and effective campus design strategy that satisfies cultural, political, social and commercial components as well as the academic environment is a prerequisite for future campus design. When designing a campus nowadays, the architect's responsibility is not only to create a good space, but also to create a visionary strategy and communicate between the different components, as the architect now has many socio-economic entities as well as design. This approach is inevitable in terms of the legitimacy and sustainability of the existence of campus structures both within itself and with the city."

The college and the university area provide people an opportunity to learn, meet, explore, think or relax. Campus areas, especially classes, affect the attitudes about education. Everyone has good and bad memories about campus. Nowadays, campus design is adopted to human-centered design with a few thoughts, but human-centered design should be included in the whole process. Human-centered designs start by taking into account the needs of the actual campus users, students and educators, to support the learning transformation of the area.

3.1 Flexibility

Design strategies aimed at achieving "flexibility" can be summarized as providing design flexibility, ensuring continuity during use of the functional need-architectural environment, and meeting technical requirements. According to these statements; it seems that approaches to flexibility are more theoretically possible than permanent-based approaches in terms of achieving each of the three objectives mentioned, since they are based on interchangeability. Flexible architectural strategies can only meet the functional needs-architectural environment continuity while flexible approaches can additionally meet the needs of differentiated needs programs and technical changes during design [2].

"Growth" is a preconceived "whole", a set of pieces built at certain stages and eventually reaching "full", "whole". This means designing, designing the future and goals [3]. When considering the concept of growth in campus planning, campus planning is like a small urban planning, and making predictions about human communities, such as in a city, makes it difficult to solve the problem. However, the needs of the future on the campus are controllable and determinable, helping the designer. In this respect, besides the developments and changes that can be determined in the development of the campus, it is inevitable that those which are uncertain. Campuses develop and change over time, and this is the usual view of science, human nature and community life. Some of the reasons for this change in the campuses, and therefore the growth, are listed by Erkman [4] as follows;

- Change in educational aims and methods,
- Change in research objectives and methods,
- Additions made to existing branches; the development of teaching fields and/or the opening of new teaching fields,
- Establishment of new faculties, institutes and colleges,
- Increasing the number of students.

While campus developments result in growth, developments also require flexibility. Flexibility must be provided at the same time in the general layout of the campus and in the entire infrastructure as well as being a desirable feature in the university buildings. This approach also enables large-scale changes [5].

3.2 Perceptibility

Every object that can be perceived is available in both time and shape. An object can not be perceived from a single point in its entirety. Objects are perceived in a certain process as the result of the current of impressions. Circulation has an important place in the perception of the campus environment. Besides, perception is with all senses, sight, hearing, taste, smell, touch. In addition to these, proportion, order and degree of perception increase [5]. As well as being part of the urban area, the campuses also have an urban area with functions, landscaping, circulation areas and environmental landscapes. In this context, environmental perception can be mentioned to express the perceptibility of the campus.

Selection is the process of decision making as a result of the perception of the environment, the continuity of its recognition and evaluation, the perception of the environment by sensory organs, the recognition of the environment and the recognition of the qualities of the environment. In order to define the environment according to the formal approach of environmental perception, the environment must be grasped as a whole and evaluated as a whole. Each of the parts forming a whole has a distinctive identity. When these separate pieces join together and form the whole, the identity belonging to that region forms. In order for the identity of the region to be precisely identified, the identities must be identified according to the results of the analysis of the parts and the necessary environment must be provided to ensure the sustainability of this definition.

When the campus structures are evaluated from this point of view, the campus gives a whole sense of perception with the education- accommodation-resting-sports units, the green areas and the circulation areas.

Another fact that has an important place in the perception in the planning of the campus is the circulation. As a result of movement within a human environment, the environment is perceived visually, physically and psychologically.

3.3 Accessibility

The perception of the campus environment can be provided by the best planning of the circulation. Furthermore, perception becomes more powerful with the movement, which is the main element of the circulation [5]. The campus transportation system is not restricted to transportation personnel only. The three formulas developed to provide circulation correctly solve pedestrian transport with systems developed independently of each other. These;

• Two-dimensional distinction with horizontal arrangement: The Radburn system, in other words, allows pedestrians and vehicles to move in the same plane. The vehicles reach the center from the main artery and its secondary routes. In this way, the circulation areas in the campus center are reserved, freed from the vehicles, and providing regular and safe movement. (eg Stirling, Surrey, Gaziantep Universities)

• Three-dimensional distinction by vertical arrangement: In this system where evaluation is made on the area where the university is located, it is aimed to use more valuable areas more efficiently. In this system, pedestrian-vehicle separation is provided by the differences in elevation. The system will show advantages and disadvantages according to the position of pedestrians and vehicles in these level differences to be given. (Example: Bochum, Bath, East Anglia and Free Universities)

• Distinction in time dimension and fourth dimension: In this system, the separation of pedestrian-vehicle is provided by time factor. The advantage of this system, which can be used on every university campus, is that it does not require cost [6].

The concept of "accessibility" can be expressed as the physical control of spatial composition within a campus regulation. Physical control; "Belonging to the place in the vicinity of the person; as a point of reference, such as the location of activities, the directional elements, and the point at which they are located "[7].

Especially in the planning of the campus there is a significant difference between the vehicle and the pedestrian. Human beings perceive and perceive physically and psychologically as if this environment

is the visual direction as a result of the movement within an environment on a macro scale. This movement can be thought of as a pedestrian walk because when walking around people can get the best recognition of their surroundings and gain the ability to communicate with other people and objects. It is observed that in the current urban designs, the effort of giving the urban spaces "pedestrian scale", which is free from the flood-driven vehicles, is seen as the forefront. On the one hand, this "pedestrianization" operation is carried out in the existing urban areas, while on the other side, this principle is given great importance in the newly established cities or urban parts. When examining university campuses in this context, an important feature is; [3], which allows a student to move between the two most extreme faculties in 10-15 minutes between two courses.

People look for physical and psychological comfort in their living environment. Judith Heerwagen has worked on how a person affects prosperity and productivity, creativity and interaction. In his work, he focused on four items that should be together to create positive and productive spaces: cognitive activity, social support, emotional functionality, and physical function. In other words, it is important to design all these four items in campus designs.

4 UNIVERSITY CAMPUSES IN THE CONTEXT OF INCLUSIVENESS

In the last 20 years, the number of students with disabilities has tripled in university campuses [8]. Nevertheless, despite the increased presence on campus, it seems that disabled students can not complete their education according to their non-disabled peers [9]. As the group of disabled students continues to grow, faculty and staff should learn about the needs, rights and expectations of students with disabilities to achieve their educational goals.

Given the inclusiveness of higher education building design, various environmental and cultural barriers to be encountered should be considered. Blockers may include inaccessible or unsuitable main campus buildings, recreational areas, accommodation, social areas and facilities, as well as poor teaching and learning environments. Inclusive building design, elimination of obstacles, and environment ensure that everyone can use it without the need for individual customization.

In this study, the campus and accessibility pages of universities such as Washington University, Connecticut University, Minnesota State University, Istanbul Technical University and Mersin University were examined.

4.1 University of Washington

The DO-IT (Disabilities, Opportunities, Internetworking, and Technology) Center is dedicated to empowering people with disabilities through technology and education. It promotes awareness and accessibility—in both the classroom and the workplace—to maximize the potential of individuals with disabilities and make our communities more vibrant, diverse, and inclusive.

The DO-IT Center strives to;

- increase the success of people with disabilities in challenging academic programs and careers;
- promote the application of universal design to physical spaces, information technology, instruction, and services;
- freely distribute online content, publications, and videos for use in presentations, exhibits, and the classroom; and
- provide resources for students with disabilities, K-12 educators, postsecondary faculty and administrators, librarians, employers, parents, and mentors.

4.2 University of Connecticut

This site is the product of grant-funded projects at the University of Connecticut, Center on Postsecondary Education and Disability. Universal Design for Instruction (UDI), the foundation for grant activities, is an approach to college instruction that anticipates diversity of learners and provides a framework for college faculty to incorporate inclusive strategies in their teaching. The FacultyWare site was designed to provide with a broad range of information and tools to enhance the design and delivery of instruction for diverse college students.

A web page called Universal Design for Teaching (UDI) at the University of Connecticut was established and worked on the inclusive design context. UDI Online is a unique collaboration between the Neag Vocational School of Education and the Disability Center and the Center for Handicapped Students in Student Affairs. Previous work at UDI has been expanded through this project by applying the Ninth Principles of UDI to second-level online and technology-blended learning environments.

The UDI Online project focuses on the concept of "designer as a faculty" and aims at electronic teaching "e-Tools", which faculty members can apply in their lessons without the need to support a training or web design team. For this project, e-Tools is defined as digitally presented materials, teaching techniques and / or strategies that can be used or guided by the course instructor to create a learning environment that benefits a wide range of learners. The E-Tools selected for inclusion in the E-Toolbox have been reviewed by the UDI Online project team and have met the criteria for accessibility, availability, effectiveness and implementation of one or more of the UDI Policies. E-Tools was then used and reviewed by faculties in five higher education institutions:

- Keene State College (New Hampshire)
- Middlesex County College (New Jersey)
- Mitchell College (Connecticut)
- Southern Connecticut State University
- University of Connecticut

4.3 Minnesota State University

The University of Minnesota has aimed to ensure that all students with disabilities have equal access to all opportunities. They aimed to serve as a resource for faculty members, staff and the university community to coordinate accommodation for eligible students and provide access for all.

As seen on the campus accessibility map, most buildings on the campus (green ones) are listed as accessible.

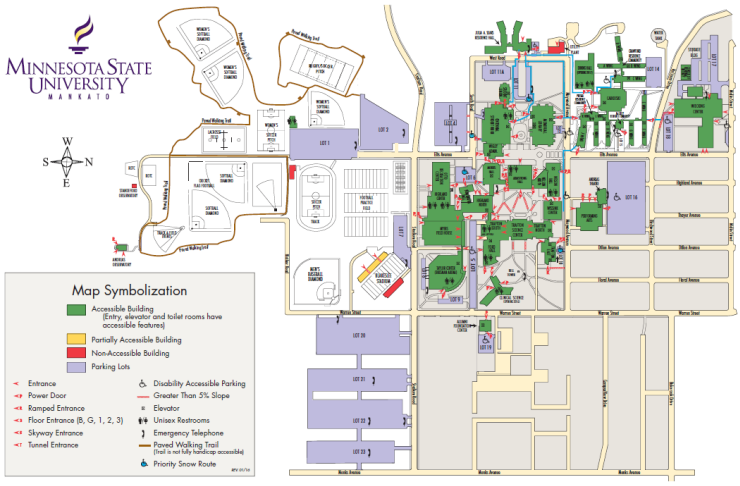

Figure 1: Campus accessibility map located on the web page.

4.4 Istanbul Technical University

There are many different studies within the scope of "Understanding Life without Barriers" in ITU. Both the management cadres and the student clubs are working day by day with new projects and activities. "Voice Steps, Universal Textile Center, Barrier-Free and Pedestrian-Friendly Sidewalks" are examples of work done.

It has launched the first in-door navigation application at a university in Turkey. In closed spaces, bluetooth navigation makes it easy to find places and directions. Within the scope of the project, 120 bluetooth beacons were installed in the corridors of the Faculty of Civil Engineering. With the "Voice Steps" application downloaded to smartphones, location-direction description can be obtained after the desired location is specified. Both written and spoken practice can provide convenience for everyone, not just disabled people. Starting from July 2015, ITU Faculty of Civil Engineering can be

used in all the halls, classes, rooms and other units within the faculty which are defined in the devices. In addition, output ports for bluetooth devices, fire escapes and elevators are also described.

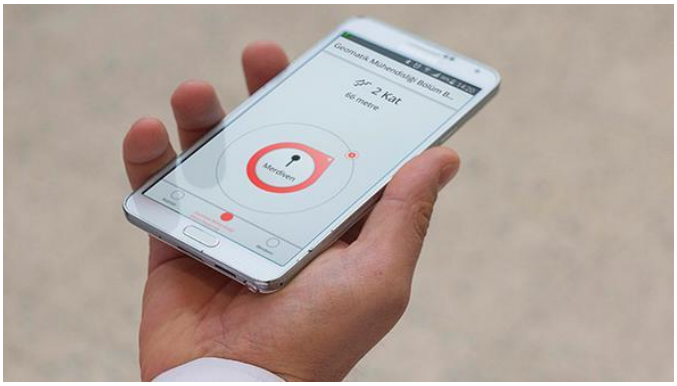

Figure 2: Software interface.

With a barrier-free and pedestrian-friendly, the pavements within the campus have changed. The width of the sidewalks is 3 to 4 meters, while the height is limited to 5 cm and the ramps are made. In this way, it is possible to move easily for the settlement without having to open a special way for disabled people. At the same time, tactile surface studies on pavements continue. In addition, with the application of permeable concrete used in the campus, the formation of water deposits in roads and pavements is prevented.

In the university, there is also a "Universal Textile Design Center" which designs garments based on the needs of people with disabilities.

4.5 University of Mersin

It is the preparation of the campus accessibility map which is one of the works done in the context of inclusion in Mersin University. The campus accessibility map, the Barrier-Free Living Unit web page, provides detailed maps for each individual access.

5 CONCLUSIONS

Identifying the problems faced by users on university campuses, exploring the approaches and examples that will enable all users to access campus equipment and use them as they wish, and developing solutions to the problems encountered.

The concept of inclusiveness goes beyond just providing special features for various segments of the population. Rather, it emphasizes a more inclusive approach at the outset of the design process, which will ask whether a product, graphical communication, building or public space can be done both by aesthetically pleasing, functional and by the greatest number of users [10].

By reviewing the different types of buildings built with the concept of inclusive design and taking into account the various campus examples, it is now possible to create a database of how to use the inclusive design model in the design of university campuses and to create a method by which reference can be made to this topic.

As a result, all users should be based on the concept of "everyone" as the target audience in the design because they may be different from each other in terms of the situation they are in.

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