PERFORMANCE EVALUATION AND DESIGN GUIDELINES FOR EQUITABLE ACCESS OF STUDENTS WITH DISABILITIES IN UNIVERSITY CAMPUS OUTDOOR ENVIRONMENTS

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ABSTRACT

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The primary aim of this study is to develop performance evaluation and design guidelines for the design of university outdoor campus spaces that take into account the needs and desires of students with disabilities (SWDs). Constant performance evaluations of outdoor campus spaces are important in advancing spatial design for the equitable access of SWDs in campus life. Forming a strong relationship between the individual and his/her lived environment, assessments of accessibility performance dimensions depends fundamentally on the notion of user and spatial aspects. This thesis argues that performance evaluations should not only search for physical accessibility issues, but should also respond to equitable access, and in turn, to the social inclusion of SWDs in university spaces.

To achieve the objective of the study, firstly, a case study was carried out to understand the relevant phenomena, involving a systemic approach to observing the experiences of 'real' users in an actual campus setting. Secondly, considering the rights of all

students related to the campus, a study was made of the design of inclusive campus outdoor environments through the field study and the lens of Lynch's normative theory (1981) to help explore, scrutinize and contextualize the performance evaluation parameters. A re-reading of Lynch's performance dimensions from the perspective of equitable access can be considered a valid approach, given their basis on the idea of environmental justice. Thirdly, the Campus Accessibility Evaluation Index (CAEI) is developed with the aid of empirically grounded design parameters in order to test the developed normative framework in the study.

The contribution of this dissertation to the body of architectural literature falls under two aspects. First, it proposes a new contextual framework that follows, questions and interprets universal architectural and planning theories within a local context, emphasizing that an in-depth look at a local sample will broaden architectural theories. Second, the thesis raises arguments that aim to close the gap between normative and theoretical design parameters and architectural practice, highlighting that priority should be given to efforts to bridge this gap. The development of the CAEI for application in architectural practice nationwide is the most noteworthy contribution of this thesis, forming a strong relationship between the practical and theoretical aspects.

Keywords: Performance Evaluation, Equitable Access, Accessibility, Campus Outdoor Spaces, Kevin Lynch.

ÖZ

ENGELLİ ÖĞRENCİLERİN ÜNİVERSİTE YERLEŞKESİ DIŞ MEKÂNLARINDA EŞİT ERİŞİMİ İÇİN PERFORMANS DEĞERLENDİRME VE TASARIM ÖLÇÜTLERİ

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Bu tezin amacı, üniversite yerleşkesi dış mekânlarının tasarımında engelli öğrencilerin gereksinim ve beklentilerini karşılayacak performans değerlendirme ve tasarım ölçütlerini geliştirmektir. Engelli öğrencilerin kampüs yaşamına eşit erişimini destekleyen mekânsal tasarımın gelişiminde, kampüs dış mekânlarının performans değerlendirmesi önemli yer tutar. Erişilebilirlik performans ölçütlerinin değerlendirilmesinde, birey ve onun yaşadığı çevre arasındaki ilişki temelinde fiziki çevrenin kullanıcı ve mekânsal boyutuyla ele alınması önemlidir. Bu tez performans değerlendirme yaklaşımının teknik erişilebilirlik normların yanında, engelli öğrencilerin üniversite mekânlarına eşit erişimlerine cevap veren ve bu yolla onların sosyal katılımlarını destekleyen nitelikte olması gerektiğini savunmaktadır.

Bu tezin amacını gerçekleştirmek için, *öncelikle*, sistematik bir yaklaşımla, üniversite yerleşkesinde 'gerçek' kullanıcıların deneyimlerini gözlemleyerek, derinlemesine anlamak amacıyla alan çalışması yürütülmüştür. *İkincisi*, üniversite yerleşkesinde tüm

öğrenciler için eşit eğitim hakkı vurgusuyla, alan çalışması ve Lynch'in normatif teorisi (1981) merceğinden kapsayıcı kampüs dış mekanları tasarımı için performans değerlendirme ölçütleri geliştirilmiş, incelenmiş ve kavramsal bir çerçeve sunulmuştur. Bu tez kapsamında, çevresel *adalet* fikri temelinde kurgulanan Lynch'in performans ölçütlerinin, eşit erişim açısından yeniden okunması geçerli bir yaklaşım olarak kabul edilmektedir. *Üçüncüsü*, çalışmada geliştirilen normatif çerçeveyi test etmek için, ampirik temelli tasarım parametreleri yardımıyla Kampüs Erişilebilirlik Değerlendirme İndeksi (CAEI) geliştirilmiştir.

Bu tez, yerel bağlama derinlemesine bakışın mimari kuramı geliştireceğini vurgulayarak, evrensel mimari ve planlama teorilerini yerel ölçekte sorgulayarak ve yorumlayarak yeni bir kavramsal çerçeve önermektedir. Ayrıca, normatif ve teorik tasarım parametreleri ile mimari uygulama pratiği arasındaki boşluğu doldurmaya öncelikle önem verilmesi gerektiğini vurgulayarak, bu alanda argümanlar öne sürmektedir. Pratik ve teorik alanlar arasında güçlü bir ilişki kurmayı hedefleyerek, ulusal ölçekte mimarlık pratiğine katkı sağlayacağı düşünülen CAEI'ın tasarımı bu tezin mimarlık alanında en önemli katkısıdır.

Anahtar Kelimeler: Performans Değerlendirme, Eşit Erişim, Erişilebilirlik, Kampüs Dış Mekânları, Kevin Lynch.

To my lovely daughters,
Bilge and İlke
and
my love,
Burak

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CHAPTER 1

INTRODUCTION

1.1 Aim and Scope of the Study

Equitable access to post-secondary educational built environments for students with disabilities (SWD) has become a widely discussed and valued issue in both national and international circles. Since universities are seen as pioneering institutions in a community in their contribution to the social, cultural, economic, political and technological development of a country, they should take a leading role in society in supporting and taking measures to ensure the successful equalization of opportunities for all, including SWDs. The shift in the approach to disability from an individualistic to a social-based perspective and the changing framework of legislation aimed at equal rights in relation to the transformation of the disability approach are crucial issues for equitable access of SWDs in Higher Education Institutions (HEIs).

In Turkey, the right to equitable access to higher education for SWDs began to be addressed in 2005 with the enactment of Disability Law no 5378. This law brought about the adoption of the '*Regulation on Collaboration and Coordination of Higher Education Institutions for Persons with Disabilities*' (YÖK, 2006; 2010), launching discussions of how to best meet the needs of SWDs to ensure their equal participation in post-secondary educational environments. Specifically, the related regulations contained technical design specifications that were to be applied in all public spatial environments, including university campuses. In particular, the '*Regulation for*

Monitoring and Controlling Accessibility' (ASBP, 2013) listed a number of design standards and provided a checklist do define whether a design can be stated as accessible or inaccessible. This proposed way of evaluating the design of the built environment has some significant gaps that have resulted from the habit of providing accessibility through piecemeal design applications, rather than considering the equal participation of the users in community life. While the role of the technical design standards cannot be overrated, the primary goal should be the formation of an integrated design approach that influences the efficiency of use of all community members. Due to a lack of such a design and evaluation approach, equal access in campus built environments, like other public spaces, remains as an on-going challenge for SWDs in Turkey, despite the significant legal arrangements targeting equal rights for all made over the last decade.

The level of accessibility for SWDs in the physical environment of a university campus depends on *the fit* between the proposed facilities, services and activities of an institution and the spatial needs of SWDs. In this respect, the design should promote this bilateral relationship, regardless of whether it is a new setting being designed, or an existing setting being redesigned. To achieve this, conceiving effectiveness of the pre/post occupancy of a campus setting in terms of equal access to all spaces should be addressed in the earliest phases. On this point, comprehending the practical concerns of the real life experiences of the users is crucial when aiming to ensure equal participation in campus life. It is vital that a comprehensive understanding of local needs is obtained, as this can lead to the most suitable planning approach for the focal spatial environment.

This thesis aims primarily to develop evidence-based national performance evaluation design criteria for the holistic design of open spaces in campuses to promote the independent and equal participation of SWDs in post-secondary educational facilities, resources and activities, arguing that this in turn will ease their social interactions. To achieve the objective of the study, *firstly*, a case study was carried out to understand

the practical lived experiences of SWDs in their own educational setting, Middle East Technical University (METU). The sample comprised students requiring the use of wheelchairs and those with severe visual impairment. The main reason for choosing these two groups of users is that their experiences are based on extreme living scenarios (Cassim, 2013), which will provide insight into how the built environment can meet the wide range of spatial needs holistically. It emphasizes that a deep comprehension of the phenomena of 'real' user' experience will contribute to a comprehensive understanding of spatial experiences in an evidence-based approach. *Secondly*, the performance dimensions established by Lynch within the normative theory philosophy he proposed for "a Good City Form", being *vitality, sense, access, fit and control,* served as a valuable source for exploring, scrutinizing and contextualizing the performance evaluation parameters of a campus built environment for this study. Considering a good city as an *open* one that is *accessible, adaptable, and tolerant to experiment*, Lynch highlights the need of a city to enhance the *continuity* of a culture and the *survival* of its people, increasing the *sense of connection* in time and space, and permitting *individual growth,* on an equal basis (Lynch, 1981, pp. 116–117). In view of the arguments about the right to equal participation in the spatial environment of a higher education facility, a look at the design of a campus built environment for all through the lens of Lynch's normative theory would appear to have a substantial conceptual relevance.

In recent times, the integration of the theme of accessibility into the *Performance Evaluation (PE)* concept has been strongly emphasized, addressing the need to sustain the development of social as well as physical integration into public life. The PE concept has been built around the interactive relationships between people and the physical environment in which they experience (Preiser & Vischer, 2005, p. 3). In this sense, it is based on the bilateral relationship between "activities" (regarding user preferences) that a postsecondary institution offers and the opportunities for "participation" (regarding design measures) by SWDs in the offered facilities and services in a campus setting. The Performance Evaluation concept has been addressed

since Lynch (1981) put forward his normative theory. I believe that exploring normative design principles on a national scale through an interpretation of Lynch's good city performance dimensions can contribute significantly to the issue of expanding accessibility in higher educational spatial environments from a different perspective. This thesis eventually asserts that the proposed performance evaluation design criteria would contribute 1) to advancing the performance evaluation approach from the perspective of accessibility of the outdoor spatial environment of a university campus in an empirically grounded way; and 2) to extending designed-based guidance to assist HEIs in taking a strategic accessibility design approach that ensures the inclusion of the entire campus community.

1.2 Method and Structure of the Study

This thesis is founded mainly on the relationship between the equalization of opportunities in a post-secondary educational environment and the design of its built environment, and is based on supporting "the right to education for all students" argument. Founded on this main argument, in the first chapter, the introduction, the existing discussions of *right to access in higher education* from *attitudinal, legal*, and *architectural* dimensions, on both a national and international scale, are presented. All three of these interrelated themes are considered vital for the success of the rightful inclusion of SWDs in higher education. In shifting the design approach from an "accommodation model" to "inclusion model", this chapter asserts the need for a holistic design evaluation perspective that may lead eventually to the (re)design of open spaces on campuses, appreciating the diversity that exists among students, including SWDs.

The second chapter makes an analysis of the large and growing body of literature to make a comprehensive presentation of the conceptual position of this study. It starts with a discussion of the main argument related to the accessibility of public spaces,

taking into account the concepts of *inclusion* and *justice*. The design of the outdoor physical environment of a campus, as a spatial environment that is used by all, urges discussion of its relationship with the notion of social inclusion and justice. The issue of "how the relationship between people and the environment should be comprehended through the design and evaluation studies" is dwelled upon with the support of relevant literature. The emphasis of the discussion is based on the interactive relationship and the fit between the *person* and the *environment*, associated strongly with *disability* and *design.* Herein, this chapter elucidates how the commonly used spaces between buildings contribute to the physical and social inclusiveness of students in enhancing the spatial fit between the built environment and the spatial needs of SWDs. Having given the motivation behind the development of a holistic user-centered performance evaluation framework, this chapter goes on to emphasize a holistic design and performance evaluation framework for the design of inclusive open spaces on campus.

The third chapter dwells specifically on the theoretical and practical aspects of the proposed evaluation and design guidelines. A comprehensive analysis is made of the theoretical and methodological perspectives of other design evaluation studies, contributing to the establishment of the theoretical and methodological framework for the proposal of performance design guidelines. Emphasis is on the growing requirement for integrated and evidence-based design evaluation guidelines the built environments of a campus at a national level, facilitating the establishment of consistent planning strategies.

In support of the arguments put forward in the previous chapter, the fourth chapter presents a field study in which the aim is to understand the lived experiences of SWDs, utilizing a mixed method research design involving qualitative and case study methods. The data collection process includes three stages: (1) an analysis of the physical environment, including the behaviors of its users and activities; (2) a visual documentation of the design elements that influence physical access; and (3) conversational walkabouts with SWDs, utilizing a participatory action research

approach. Through a one-day tour with students in wheelchairs and those with visual impairments in their own educational environment, the METU campus, *face-to-face in-depth interviews* and *participative observations* were carried out to understand the spatial factors affecting the participation of SWDs in diverse activities on an equal basis. At the end of the data collection process, the gathered qualitative data, garnered from real user experiences, is analyzed in the content analysis. A comparative analysis of both the visual and narrative data is made to enhance the reliability of the field study by validating the experiences of the space as described by the participants.

In the fifth chapter, the analyzed findings are opened to discussion with reference to Lynch's *performance dimensions* for *A Good City Form* (1982), as well as a number of fundamental person-environment studies in literature. In this regard, the aim is to compile a contextual framework for holistic performance evaluation design parameters so as to permit a comprehensive evaluation of open spaces on campus from the perspective of SWDs. The study concludes with the review and discussion of the findings of the research.

CHAPTER 2

'EQUITABLE ACCESS' TO UNIVERSITY EDUCATION FROM INTELLECTUAL, ARCHITECTURAL AND LEGAL ASPECTS

This chapter presents a comprehensive evaluation of the attitudinal, architectural, and legal aspects that are seen as inter-related contexts in assuring the inclusion of students with disabilities (SWD) in a higher education environment. The realization of a campus plan that can enhance the social and cultural opportunities of SWDs and can provide them with an academic education that is equal to that provided to the able-bodied depends on the success of all aspects in unison.

2.1 Impairment, Disability and the Physical Environment: Philosophies and Models

Historically, understandings of disability have been characterized according to three different disability models, which are the *morality model,* the *medical model* and the *social model of disability*. The Morality Model, which has the longest history, is based on "culturally and religiously-determined knowledge, views and practices" (Oliver 1996; Seelman, 2007), in which communities tend to put people with disabilities in a position that may range from human to non-human in terms of implications of cosmology, social organization and other factors (Seelman, 2007). The Medical Model, known also as the Individual Model, is established upon scientific views and practices, and views the nature of the "problem" to be a result of individual

inadequacy, inability and abnormality (Oliver, 1996; Barnes & Mercer, 2010; Barnes, 2012). Taking a medical perspective, focus is on accommodating individuals in the physical environment by asking for support and opportunities in an individualistic aspect. This results in partial design practices that fail to advance the provision of equal access to all types of public spaces (Oliver, 1996; Block et. al. 2006, p. 117).

As a result of the negative impacts of individualistic disability approaches, social action was needed to tackle the problem and to provide the necessary alterations to ensure the full participation of people with disabilities in all spheres of community life, which is substantially the common duty of the community (WHO, 2001, p. 21). In this sense, international disability movements challenging the conventional approaches to disability and the human rights issue have come to the forefront. People with disabilities started to ask for their rights in the late 1960s and 1970s through the Civil Rights and Women's Right Movements (Oliver, 1996), which also influenced a shift in political strategies (Shakespeare & Watson, 2001). The "Disability Rights Movement", "Normalization Activity" and "Independent Living Movement" at those times were important drivers in the development of the human rights issue, bringing about an increase in social efforts in Western countries. The international movement of people with disabilities of the late 1960s brought about a gradual transformation of medical-based identification to one that was more socio/political, referred to as the "Social Model" of disability (Oliver, 1996; Barnes, 2012; Shakespeare & Watson, 2001).

For the Social Model, in contrast to the Medical Model, the problem is related to institutional, environmental and attitudinal barriers rather than individual impairment (Oliver 1996; Barnes, 2012; Strange, 2000, p. 20). Having implied this social-based disability approach, Kroeger (2010) states that:

> Disability activists and scholars emphasize that the primary cause of the problem is because of society's failure to value and appreciate disability and design

> environments that are welcoming and inclusive rather than individual limitations or biological differences. (Kroeger, 2010, p. 3)

In this description, Kroeger, like many other researchers (i.e. Gill, 1994; Block et al., 2006, p. 117), places significant emphasis on poorly designed environments as a key factor in the problem of discrimination.

Even though the powerful and effective role of the Social Model, which is central to the disability movement, has received considerable support in disability literature, some claim that its success has been weak. To illustrate, Shakespeare and Watson (2001) criticize its inadequacy in a way that it could be reduced to a simple slogan: '*disabled by society not by our bodies*' (Shakespeare & Watson, 2001, p. 3). They suggest an embodied ontology as the best starting point for disability studies, claiming that this would lead to a more adequate social theory of disability. In this approach, "there is no qualitative difference between disabled people and non-disabled people, because *we are all impaired*." Hence, it includes all dimensions of the experiences of disabled people as the inherent nature of humanity (bodily, psychological, cultural, social and political) rather than being limited to either a medical or social approach (Shakespeare & Erickson, 2000, p. 6-10). That is to say, this embodied notion of the disability model indicates that disability is, in fact, experienced at a personal level, although experiencing disability cannot be limited only to the human body.

Efforts to break the dividing line between "normal" and "disabled" [meaning impaired] and to see disablement [impairment] as *the normal condition of humanity* rather than unique to a specific population have been supported for a long time (Zola, 1989 cited in Imrie, 2004, p. 280; Sutherland, 1981, cited in Shakespeare & Erickson, 2000, p. 11; Gillies & Dupuis, 2013, p. 196). Based on this embodied position, the World Health Organization (WHO) proposed the *International Classification of Functioning, Disability and Health (ICF)* in 2001 as a comprehensive system for the consideration of disability. Taking a multi-faceted approach, the ICF categorizes

health and its related domains with regards to the body, society and individual context (Figure 1). It assembles systematically a wide variety of domains in viewing disability as a universal human experience by "mainstreaming" the experimentation of disability (WHO, 2001). While doing this, it addresses environmental factors that can limit activities or restrict participation, as well as personal factors (WHO, 2001). This way of looking at disability seem to help describe it in a more unified, non-discriminative and social-based way.

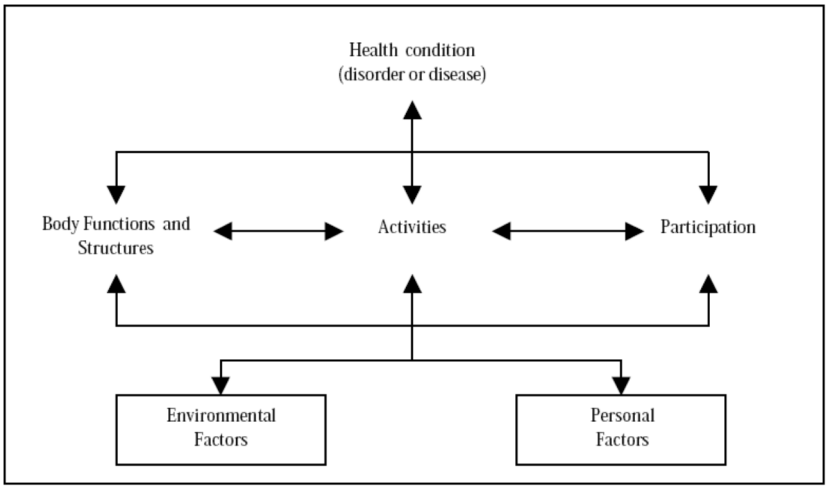


Figure 1: How disability is viewed in the ICF system (WHO, 2001, p. 18).

The bulk of environmental studies in literature, as in other fields (such as social, educational and political), focus on the need to transform the idea of disability from medical-based towards an embodied social constructivist position. In this respect, Barnes addresses the need to shift the perspectives and assumptions of disability towards a unified social-based approach, and to reflect this on the design field (Barnes, 2011, p. 55). In this right-based approach:

> The responsibility falls on designers of the environment or those in power to affect change in that environment, and not the person with a disability. Thus, this model promotes the social responsibility of all persons in creating an environment that is usable by the highest number of people possible – whether it is a physical, informational, curricular or social environment. (Block et al. 2006, p. 117)

The realization of this responsibility of designers should be the central concern of architecture, with the aim of promoting *active citizenship*, *democratic participation*, and in turn, the *inclusion* of all community members in public life. This is valid also for post-secondary education environments, meaning the full time involvement and accommodation of all students, regardless of (dis)abilities, as well as enhancing the supportive environment for participation in all activities. However, in the real world, SWDs are still under-represented in higher education.

In higher education institutions (HEIs), the responsibility of the creation of an inclusive educational environment belongs to each body within an entire institution, ranging from the users of the physical environment to governmental authorities. As part of a specific effort, disability service professionals should have a crucial role in bringing about a paradigm shift in attitudes and promoting actions that change the focus from individual accommodation to the removal of all spatial barriers in the everyday life of the campus (Block et al., 2006; Loewen & Pollard, 2010).

The literature review highlights two main problems that can be identified as results of the negative disability understanding of HEIs. *Firstly*, disability service providers in HEIs have been unsuccessful in forming human right-based values and beliefs related to disability, which should guide their work (Kroeger, 2010, p. 3; Beauchamp-Pryor, 2007, p. 1). This indicates a reluctance or ignorance in securing equal participation of SWDs in campus life. *Secondly*, the indifference to the issue has resulted in a lack of training and adequate knowledge about the legal norms related to their responsibilities (Katsiyannis et al., 2009, p. 36). While citing related studies examining the experiences of SWDs, Katsiyannis et al. (2009) emphasize that since ideological values underpin

the policy mechanism of institutions, the current policy instruments become meaningless. As a result, disability is perceived largely as an individualistic issue, which results in focus on *care* rather than *equality* (Drake, 1999, Katsiyannis et al., 2009, p. 36). In the case of Turkey, disability service providers tend to lack social insight into the issue of disability, and have little knowledge of support mechanisms that could secure the inclusion of SWDs in educational life. Furthermore, Turkish universities tend to resolve problems related to the integration of SWDs into campus life only because of the impact of legislations and the increasing population of SWDs who are looking for their needs to be met. The "Inclusive Universities Workshops" that have been held every year since 2007 with the participation of all local national stakeholders have been important in supporting this process. However, although a social right-based discourse has been shared among researchers from sociological (Burcu, 2007), political (Çağlar, 2012) and architectural disciplines (Ergenoğlu, 2013), in practice, problems resulting from the individualistic view of disability have been the main drivers in the enhancement of services for SWDs in physical post-secondary educational environments (EÜÇ, 2013; EÜÇ, 2014).

The social theory of disability in the embodied notion of *education for all* would influence considerably the level of inclusion of university students who are in need of divergent support in their educational environment, which is supported also by the study of Powell (2013). The following sections indicate how architecture and legal conventions all point to a significant transformation in disability paradigms in the disability models of medical and social theory in the light of the changing sociological paradigms, but highlights a need for more efforts to succeed in practice.

2.2 Architectural Aspects to Enhance Access in Built Environments for Higher Education

About 15 percent of the world's population live with some form of disability, based on 2010 global population estimates (WHO, 2011, p. 29). In Turkey, this figure was put at 12.29 percent in the "2002 Turkey Disability Survey", which is a unique national data source of the disability population census (DİE, 2004). These numbers show, more or less, the heterogeneity of the human population. In any case, in the global architecture movement, which embraces respectfully the experiences of people with diverse abilities, it is essential not to exclude any community members from society. Recent architectural studies define accessibility as a pre-condition for democratic public life all around the world. For Barnes and Mercer, a lack of access to the built environment is one of the primary challenges faced by disabled people in their social exclusion from public life (Barnes & Mercer, 2010, p. 117). Universities, as pioneering institutions in a democratic society, deserve more attention in this regard. Accessibility to the built environments in HEIs, is a central issue that should be addressed to enhance and guarantee an equally welcoming physical environment for all, including SWDs (UN, 1993; UN, 2006).

Association on Higher Education and Disability (AHEAD),[1] founded in 1977, highlights the need for an inclusive higher education campus life. It has established goal-oriented guidelines for the creation of welcoming campus environments all over the world, raising the value of the Universal Design (UD) paradigm (AHEAD, 2014; Block et al., 2006, p. 117). The issue of inclusiveness has been discussed in depth in the process of accrediting institutions of higher education. Furthermore, the need for all architecture candidates to possess accessibility and life safety design accreditation

[1] AHEAD is a professional organization with more than 2700 members from all over the world. It aims to meet the needs of people with disabilities in all areas of higher education by taking an active role in all facets of the promotion of their full and equal participation in higher education (AHEAD, 2014).

has also been brought to the agenda by international and national architectural accreditation boards, given the central role of architects in the design of inclusive built environments on university campuses. The National Architectural Accrediting Board (NAAB), established in 1940 in the United States, and the Architectural Accrediting Board in Turkey (MİAK), established in 2006, both emphasize the importance of inclusive learning environments to architecture students, and also the acquisition of the necessary knowledge, skill and competence in inclusive design among students for the accreditation of architectural degree programs (NAAB, 2013; MO, 2006).[2]

Such worldwide efforts to advance the rights of individuals with disabilities has brought about an increase in efforts to establish policies and planning and design practices that enable SWDs to access the benefits of a postsecondary education on an equal basis (Gillies & Dupuis, 2013, p. 193).[3] There are two important tasks to be incorporated into these practices, and thereby, to ensure the rightful integration of SWDs into campus life. Firstly, providing specialized services is essential in maximizing the ability of students to participate equally in their chosen course of studies; and secondly, campus spaces should ensure their physical and social involvement (Hill, 1992, p. 49; Çağlar, 2012, p. 92).

The physical settings of HEIs are generally different from those of primary or secondary schools. It is during post-secondary education that individuals begin to learn life skills, and it is in this period that significant contributions are made to personal growth and as well as professional training, preparing people for a working life (Riddell & Weedon, 2014, p. 38), and in turn, increasing their quality of life. Moreover, informal on-campus learning opportunities outside classroom, which are

[2] Ergenoğlu has been compared with the missions of NAAB and MİAK in terms of responsibility in the design of inclusive spaces in an institutional and student-oriented manner. For further information, see: Ergenoğlu, 2013.

[3] The study of Gillies and Dupuis (2013) enhances a review of the efforts and shortfalls of universities around the world for the realization of equitable access in higher education. For more information, see: Gillies & Dupuis, 2013, pp. 193-194.

mostly social and extra-curricular, help students to broaden their knowledge, viewpoints and worldviews on various issues by promoting sharing with one another. In brief, universities offer more than just academic training, being places where people live, work, eat, play, socialize and develop (Gillies & Dupuis, 2013, p. 199). Shedding light on this culture of campus life, Keast explains the nature of a campus plan as follows:

> An important criterion for evaluating campus plans would be to ask whether the campus plan encourages the maximum number of impromptu encounters with other students, with other faculty members, with visitors, with works of art, with books, and with activities with which one is not himself a regular part … the efficiency of a campus plan is not merely to provide the physical setting in which the formal activities of the university are to take place. Much of the education of anybody occurs outside and separate from the formal courses in which he is registered, and only if the plan has the kinds of qualities which will stimulate curiosity, prompt causal encounters and conversation … will the atmosphere which it produces be truly educational in the broadest sense. (Keast, 1967, p. 13 cited in Marcus & Wischemann, 1998, p. 175)

From these perspectives, the communal areas of a campus should provide diverse and unbroken commonly used activity lines, not just within the buildings, but also in the outdoor spaces. The nature of human behavior have characteristics of a *ramification* of movement, which can result in a gradation of publicness in campus life for SWDs. Hence, to provide equal opportunities for all students, including those with disabilities, all activities in all common outdoor areas in post-secondary facilities should be accessible for all on an equal basis. In this way, the entire site, with its all built elements, can also become a learning resource (Peker, 2010).

In Turkey, with the increasing awareness and consciousness of equal rights to full participation in society for people with disabilities, the number of students with

disabilities enrolling in universities has seen a gradual increase.[4] Despite the establishment of national policies to create an inclusive built environment, as mentioned above, both new and old universities alike still disregard and discourage SWDs with poorly designed spatial environments.

As a result of the indifference to accessibility in the initial phases of the design process, a retrofitting of the physical environment is needed after the construction and occupancy processes have been completed. This brings about the challenge of how to transform a spatial environment into one that is accessible and inclusive for all students. In this sense, the evaluation and re-design of the design perspective and the organizational mechanism of the campus space, and the implementation of an adopted design strategy, become important.

2.2.1 Philosophical Dimensions

In a traditional accommodation model, a disability service practitioner seeks to fulfill the accommodation needs of a student with impairments for each condition (Huger, 2011, p. 5). In this individualistic view, an SWD rarely communicates with the faculty, departmental administrators, etc., to ask for problem-solving mechanisms that will allow them access to university facilities; instead, they generally see themselves as a part of the general student population (Huger, 2011, p. 5; EÜÇ, 2013). They may need to minimize their participation in certain programs, or their engagement in spontaneous interactions or explorations due to physical barriers, which leads to decrease in their sense of belonging in the institution (Getzel & McManus, 2005, cited in Huger, 2011, p. 5). This shows that an institution embraces an individualistic view which certainly results in discrimination; and so they are required to take a new approach that eliminates all discriminative situations, enhancing equal rights to ensure equal

[4] The number of students with disabilities who continue their primary and secondary education has seen a rapid increase thanks to the national education policy (ASPB, n.d.), meaning that students with disabilities in higher education will increase to a meaningful level in the future.

participation for all in the built environment of the university campus. Such efforts should reflect the notion of social disability theory in the light of the concept of embodiment. This new right-based approach, catering for the post-secondary needs of SWDs, is represented by the *Inclusion Model* of Huger (Huger, 2011, p. 7). For Huger, such a model dwells upon an inclusive physical and social campus environment that allows all students to interface equally with the community in a *seamless* and *real-time manner* (Huger, 2011, p. 5). In a similar way, Loewen and Pollard (2010) reinforce this embodied notion, relating it to a social justice perspective in serving for the inclusion of post-secondary SWDs, based on the belief that 'full participation is a right, not a privilege' (p. 13).

The realization of the *Inclusion Model* is dependent on the adoption and application of an accessibility strategy based on the *right to equitable access for all* to the greatest extent possible. That said, ensuring the spatial environment of a campus meets all of diverse needs of all at the same time and in the same manner could be considered utopian, as expressed by Shakespeare and Watson:

> … removing environmental obstacles for someone with one impairment may well generate obstacles for someone with another impairment. It is impossible to remove all the obstacles to people with impairment, because some of them are inextricable aspects of impairment, not generated by the environment. (Shakespeare & Watson, 2001, pp. 9-10)

Herein, the crucial point is to embrace the ideal that ensures participation in all proposed post-secondary activities for all students, to the greatest extent possible. The choices of SWDs should depend on their personal decisions, intents or wills rather than on obstacles in the physical environment, as the main influencing factors in their participation in the diverse aspects of campus life. This corresponds with the perspective of celebrating *diversity* among students. Since universities accommodate a wide range of transient users, meeting as many diverse needs to the greatest extent possible becomes more important (Salmen, 2011, p. 13), diminishing the need for

individual accommodations, and thereby creating a truly inclusive built environment (Huger, 2011, p. 4). Even, the realization of the design of a full accessible campus spatial environment can transform the apprehension and attitude of a campus community by means of enlightenment, which is the foremost goal when seeking to change public attitudes. Bryan and Myers explain how societal attitudes can be advanced in the light of this philosophical framework:

> We can provide equal access for students with disabilities and help them find their voice, allowing them to advocate for themselves. These student advocates could then teach others, including their peers, to serve as disability advocates. (Bryan & Myers, 2006, p. 19)

The important design philosophies put forward by "Universal Design" (Ostroff, 2011, p. 1.3) and "Inclusive Design" (Clarkson et al., 2003) shed light on the approach of the "Inclusion Model" These design approaches would contribute greatly to the development of an integrated approach to effective planning among all responsible units in higher education institutions. To ensure an appropriate response to the ideals of these user-friendly design approaches, a more flexible and coordinated design process should be adopted, rather than a mere literal compliance with the standard rules (Lissner, 2007, p. 166). From the perspective of the social approach to disability, it should be noted here that design principles should be viewed with a *right-based approach* rather than just *compliance*, although focus is all too often on '*what must be done*' rather than '*what can be done*'. (Project Pace, 2009, n.p., cited in Loewen & Pollard, 2010, p. 5)

Universities in Turkey, whether older or more modern, have, on the whole, tended to comply with the legal requirements in support of SWDs. Enhancing supportive services for the accommodation of SWDs on an individualized basis is seen as a valid way of complying with the legal requirements. This indicates an effort to adopt traditional accommodation models in enhancing the services and spatial arrangements related to SWDs (EÜÇ, 2013; EÜÇ, 2014). In this way, SWDs are expected to

approach the Disability Support Office (DSO) to introduce themselves and to express their needs; although students may be reluctant to ask the DSO for appropriate design applications to eliminate any physical barriers they may face (EÜÇ, 2014; Huger, 2005). That said, delivered requests from students are not enough to bring about a (re)design of the campus built environment in the light of an inclusive approach.

Focusing on the notion of "what is compliance" is also valid in architectural efforts. In Turkey, as standards have not been appropriately applied in practice, and there have been no up-to-date applications of the standards in many parts of the built environment, people with disabilities are still disregarded, both in mainstream public life, and in the educational environment. Although there have been inclusive design applications in some areas, they remain insignificant, being specific case-based responses, and thereby fall short of providing unity and continuity in design implementations (e.g. adding to a ramp or a parking spaces for wheelchair users, or attaching detectable surfaces to pavements for people with visual impairments). Although these efforts have increasingly been endorsed, they are generally isolated, piecemeal actions rather than being part of an overarching plan. As such design applications cannot provide uninterrupted travel, they remain invaluable and meaningless (Vozikis, 2009). As a result of design problems, SWDs spend so much "time" just getting to class and dealing with their essential needs, which is detrimental to their academic success. In this regard, the condition of the built environment on a campus may cause SWDs to abandon their education, preventing not just, SWDs but all students from experiencing an uninterruptible, easy and safe circulation of the campus built environment.

Compliance with what is required based on legal norms and individual-centered demands, without dealing with the on-going and diverse requirements of the entire population, will always result in failure. To overcome this problematic situation, every HEI needs to develop a unified and normative framework that can serve as a consistent guide for the monitoring and evaluation of design processes. Gillies and Dupuis (2013) express this point in the following way:

> … without strict and broader accessibility and inclusion guidelines, universities may not have the information or support necessary to be proactive (or even reactive) in striving to make their environments accessible and equitable to all of the citizens who study, work, live and visit the university. (p. 194)

This unified framework demands the best organizational efforts if it is to achieve the goal of an inclusive educational environment for all. The following section addresses this process.

2.2.2 Organizational Attempts

In ensuring practical success in the design of a true inclusive campus environment in higher education, the greatest necessity is administrative will and intent. The successful accomplishment of this process rests on two main subjects. Each HEI, *initially,* should frame a unified strategy, defining the aims, missions and policy statements of the responsible bodies within its structure (Lissner, 2007; Burgstahler & Moore, 2009, p. 156; Demir-Mishchenko et al., 2010, p. 95). This strategy should follow a social-based approach that appreciates the equalization of opportunities in the built environment, and should minimize the need for present and future accommodations as much as possible (Lissner, 2007; Burgstahler & Moore, 2009; Loewen & Pollard, 2010; Demir-Mishchenko et al., 2010; Gillies & Dupuis, 2013). In Turkey, since national legislation falls short of covering all aspects of the campus accessibility issue, it is essential to describe a clearly declared policy statement for each university authority, although a review of the official websites of several universities in Turkey, it is apparent that very few (i.e. Middle East Technical Uni., İstanbul Technical Uni., Boğaziçi Uni.) have directives, and present their own mission and objectives concerning equal rights for SWDs in the physical settings of their campuses.

For *the second stage*, university authorities should establish appropriate bodies, services and mechanisms for the implementation of its policy statements. Burgstahler

and Moore (2009) express the need to overcome the following challenges in this procedure:

> Researchers have reported that many individuals in these positions have little experience with students who have disabilities and are not sufficiently familiar with the legal issues of access, do not know what policies and procedures they should employ, what specific accommodations are appropriate and ensure that academic standards are maintained, what their role is in making accommodations, how to communicate with students who have disabilities, and what campus and community resources are available. (p. 156)

Disability Support Office (DSO) are seen as effective mechanisms in facilitating the individual and collective efforts for the education of the campus community in issues of human dignity, equal opportunity and personal empowerment through independence (Loewen & Pollard, 2010, p. 14), thereby eliminating the above challenges as much as possible. They are also appropriate entities for the gathering and confirmation of disability documentation, and for the determination of equitable access for SWDs (Bryan & Myers, 2006, pp. 18-19). However, improving accessibility should not be only their responsibility, as the institution as a whole should take responsibility. Although these support services are useful in allowing the equal participation of SWDs in educational environments, a problematic situation may occur in the traditional accommodation framework when an institution concentrates only on them (Gillies & Dupuis, 2013, p. 194). Accordingly, the DSU can be considered an important structure, organizing all responsible stakeholders in an institution and guiding efficient operational mechanisms towards the creation of an inclusive campus life (Bryan & Myers, 2006; Loewen & Pollard, 2010; Huger, 2011). They can provide a prosperous road map for an institution, promoting a cultural shift to ensure the full participation of all students (Huger, 2011, pp. 3, 4, 10).

Many evidence-based studies have shown that the participation of all stakeholders in decision making related to the accessibility of the spatial environment is a top priority, ensuring the creation of a democratic atmosphere that can lead to a fully inclusive

campus culture (i.e. Gillies & Dupuis, 2013; Raheja & Suryawanshi, 2014). This all-inclusive planning process includes architects and planners, as well as administrators in relevant offices, faculties, and student representatives with diverse disabilities and other student leaders. All parties should be informed about the importance of an inclusive design approach that appreciates the full and equitable participation of SWDs. This is a cyclic system that can include also future needs. Through these collaborations an inclusive environment can be possible, and what is more, they bring the potential to increase cultural competences related to disability and diversity.

Disability services in Turkish universities vary widely from case to case in terms of the way services are enhanced, which is related closely to the structure and the education of the staff who work in those offices. Each university, as a legal obligation, should establish a disability support service department to arrange the documentation, planning and implementation process based on the findings of collaborative studies (YÖK, 2010). That said, the constituted structural mechanisms of many disability services lack the potential to fulfill the overall process of enhancing access for SWDs in a campus environment due to the lack of all-inclusive collaborative insight. As a result, many universities provide only social and psychological counseling services, with few of them actively and efficiently supporting SWDs with on-campus support facilities aimed at eliminating any structural or attitudinal barriers through a devoted office.

A lack of insight and collaborative effort among the stakeholders in an institution can have a detrimental effect on the success of design and construction for accessibility efforts. A major issue here is the failure to adopt a right-based approach that appreciates the importance of an inclusive design approach that addresses the full and equitable participation of SWDs in all educational activities. It is apparent that HEIs should make a review of how to best serve this population as part of an inclusive design process. An inconsistency exists in the fact that although there have been developments in the approach to disability that have been reflected in legislation

related to accessibility, the application of accessibility design principles has remained insufficient. This point is discussed in depth in the following section.

2.3 Design Evaluation Strategies

Studies have identified the significance of holistic and participatory performance evaluations of public spatial environments, showing how such efforts can improve the public life of the entire community (Preiser, 2011; Mehta, 2014). In a similar manner, such efforts provide the additional benefit of improving the learning environment in a democratic manner. Advocating the impact of holistic and participatory performance evaluations on the inclusive design process of a spatial campus environment, Preiser (2005) highlights specifically the need to adopt an embodied approach in a design evaluation:

> … no single type of follow-up measurement is mandated: in addition to measuring instruments, evaluators may interview users, question them on psychosocial factors, such as employer-employee relations, and on the requirements of their tasks, which are typically far from uniform. Other techniques of introducing feedback into the building design and construction process are through checklists, building codes and standards requirements, and design guidelines emanating from other sources. (p. 11)

In the light of Preiser's findings noted above, the active participation of users in any accessibility planning process, whether an evaluation of occupancy or the creation of new design decisions that take into account their essential spatial needs, ensures the creation of a built environment that meets the needs of all users to great effect, regardless of their (dis)abilities. This means that the entire experience of the environment should be addressed as part of the design evaluation process, both qualitatively and quantitatively. The more attention is paid to the comprehensive body of theoretical and practical knowledge on person-environment relationships, the more successful and efficient will be the design solutions. Herein, one basic prerequisite is

to embrace the embodied notion of the disability experience, since there is still substantial ignorance, unawareness and inconsistency in both the design process and practice. In response to the lack of considerations in architecture related to the disability experience, a study of Heylighen et al. (2013) proposes an embodied design evaluation method that reveals a richer understanding of what architecture is. By accompanying people with sensory or physical impairments through a museum, the authors aim to understand their overall spatial perceptions, which are then evaluated comparatively with the insight of the architects. (Heylighen et al. 2013, p. 7)

There have been a number of recent studies in relevant literature promoting and advancing the holistic and participatory performance evaluation approach in the university built environment context. While some emphasize need to incorporate disability experiences into any accessibility assessment procedure, others dwell specifically on understanding the disability experience.

Following the former approach, Burgstahler (2012) presents general guidelines to make campus services more welcoming, accessible and usable in his article, “Equal access: Universal design of student services: A checklist for making campus services welcoming, accessible, and usable”, aiming to develop a holistic institutional approach. This is significant in its implementation of a general framework for the holistic evaluation of services on a campus, in addressing also the issue of campus planning and evaluation. Burgstahler’s guidelines involve answering a number of yes-no questions on five topics: a) Planning, Policies, and Evaluation, b) Physical Environments and Products, c) Staff, d) Information Resources and Technology, and e) Events. (Burgstahler, 2012) Although proposing a possibly better way of looking at the evaluation of campus facilities, the guidelines fail to provide an evidence-based approach. Lissner’s expressive study (2007) “Universal Design in the Institutional Setting: Weaving a Philosophy into Campus Planning” takes up the issue, suggesting a holistic campus planning approach that follows Universal Design principles. He describes how the ideal of an inclusive design approach can be settled by developing

a holistic institutional approach to ensure effective campus planning and design, based on his own experiences as an American with Disabilities Act (ADA) coordinator during the campus planning process of Ohio State University. In such a process, not just consultant and technical groups, but also the users of the educational environment have a core role in the creation of inclusive educational spaces, facilities and services. (Lissner, 2007)

The ACTUS (Accessible Network for Turkish and Greek Societies) Project, carried out in the 2008–2010 period by Mersin University, Turkey and Thessaloniki University, Greece is another study that draws a wide-ranging picture of an accessibility strategy for the implementation of a holistic institutional approach to the creation of an inclusive campus environment (Demir-Mishchenko et al., 2010). The study proposes strategies in support of all aspects of higher education life, aiming to enhance and sustain the *education for all* concept. Those proposed strategies range from the establishment of an institutional policy statement to the creation of all-inclusive organizational mechanism within the body of a university. Continuous consultation with SWDs is highly appreciated in all phases of the process. (Demir-Mishchenko et al., 2010)

Following a similar approach to the ACTUS project, İnalhan and Sungur-Ergenoğlu (2011) set out the ABLE (Accessible Barrier-free Learning Environments) Project, the purpose of which is to establish a comprehensive and conceptual framework for the formulation of inclusive policies, programs, project development and implementation within the context of Turkish higher education. With emphasis on the need for comprehesive and unified guidance aimed at advancing academic and physical facilities in higher education up to a democratic level, the authors propose a six-stage approach that includes: 1) Prompts, inspirations and diagnoses; 2) Proposals and ideas; 3) Prototyping and pilots; 4) Sustaining; 5) Scaling and diffusion; and 6) Systemic change. As part of the framework of the project, a “toolkit” guide to accessibility in

the campus is being prepared for implementation within the scope of the Turkish Higher Education Council's drive for campus accessibility and accessible education. All of the above works are important in terms of their support for the creation of an inclusive built environment, made possible through a holistic and participatory performance evaluation approach that is not limited to physical conditions and functional aspects, but extends also to environmental and social issues. Within this holistic approach, it is essential to focus comprehensively on understanding the spatial experiences of disabled people, on which there is a vast body of previous literature.

Following such an approach, Mishchenko et al., 2010 developed a systematic design assessment methodology for a campus as part of the ACTUS Project. In their study, the accessibility of buildings and outdoor spaces in the campuses of both universities (Mersin University, Turkey and Thessaloniki University, Greece) was evaluated from the perspectives of SWDs by means of two separate checklists, which were created following a review of national and international design standards (Demir-Mishchenko et al., 2010; Demir-Mishchenko et al., 2012).

Demir-Mishchenko, in another article, aim to develop a deep understanding of the environmental problems faced by users with disabilities on the Mersin University campus, aiming to influence campus planning with an inclusive approach (Demir-Mishchenko, 2013, p. 33). In the study, two different methods were utilized to evaluate the level of inclusiveness of the campus environment: firstly, the current barriers to inclusiveness were identified objectively using a checklist developed in the ACTUS Project mentioned above (Demir-Mishchenko et al. 2010); and secondly, the same issues were evaluated based on the subjective opinions of users with disabilities during workshops, meetings and *charettes* (Demir-Mishchenko, 2013, p. 34). At the end of the study, Demir-Mishchenko concluded that both technical and subjective evaluation procedures should be implemented in the construction of an evidence-based framework that defines current accessibility problems, thereby proposing planning solutions for universally designed campus spaces (Demir-Mishchenko, 2013, p. 40).

Similarly, Rattray et al. (2008) carried out a participatory research project that involved members of the University of Arizona campus community to investigate perceptions of accessibility through a map-based qualitative research. The data investigation specified the importance of hidden and invisible barriers, the attitudinal aspects of accessibility and the adaptive strategies of campus users. A further study by Rattray presents the findings of the participatory research project (involving a group of disabled students and staff affiliated with the University of Arizona Disability Resource Center), with the aim being to analyze two buildings on the University of Arizona campus to identify patterns and meanings of mobility for campus users from a Universal Design perspective. To realize this goal, "map interviews" and Geographic Information Systems were used to identify positive and negative design attributes. (Rattray, 2007, p. 24) There have been other studies utilizing recent high-tech methods for the evaluation of the use of space. A study by Heitor et al. (2014), in which accessibility was investigated with a view to achieving inclusive environments by understanding the spatial experiences of diverse user groups at a University Precinct in Lisbon, utilizes two spatial description techniques. The first of these is an analysis of the external circulation network with a syntactic description of the campus (in citing Hillier and Hanson, 1984), which helps in the gathering of information about the excessive physical effort and time demanded of disabled people when overcoming such barriers as stairs, ramps, pathways and sidewalks (Heitor et al., 2014, p. 95). The data garnered during this first part is then synchronized with research-based fieldwork involving (1) a survey of all architectural barriers; (2) exploratory walk-through interviews with users and accessibility experts to explore different perspectives on overall accessibility on campus; and (3) space-use observations (p. 96).

All of the above studies make qualitative and quantitative searches for the experiences of SWDs with outdoor or indoor spaces in a higher education environment, using evidence-based data collection methods that include questionnaires, interviews, focus groups, field observations, user activity observations, role playing and empathy modelling. For a performance evaluation of commonly used spaces or buildings, it is

essential to generate qualitative guidelines to steer the entire process. The study by Mehta (2014) supports this idea. Based on an extensive review of literature and empirical work, the study creates a public space index to evaluate the quality of public space by evaluating empirically five criteria: inclusiveness, meaningfulness, safety, comfort and pleasurability. Mehta considers this issue as falling outside the disability context, in that several groups can benefit from this method of evaluating various dimensions of public space (Mehta, 2014). The five criteria she puts forward are also relevant for the life of people with disabilities, although there may be other more important and challenging contexts (on local cases). Integrating this information into such an index could be considered an efficient activity as far as accessibility for disabled people is considered, and for the holistic evaluation of space, it is a necessity. The body of literature needs to be expanded in this respect. Dwelling more specifically on post-secondary educational environments, the study by Khalil et al. (2012) serves as a basis of contextual ideas for the creation of a performance rating design for higher educational architectural building design. The researchers first made a review of applications in other countries to identify new guidelines that may be appropriate for their own country, after which they conducted an evaluation survey that was limited to higher educational building designs (Khalil et al., 2012, p. 28). This can be considered an initial effort to create such an index.

Previous literature offers a variety of design assessment methods to fully understand the comprehension, perspective, behavior and perception of the users of post-secondary learning environments and the associated physical spaces. These studies can be considered valuable in terms of their presentation of collected and filtered data related to the technical design specifications for physical campus environment. In Turkey, studies with explicit focus on physical university campus environments and the needs of users with disabilities are relatively scarce. From the light of a performance evaluation framework, it can be noted that there is a significant need for integrated design evaluation guidelines for the built environments of campuses at a national level. Such a standard evaluation approach would help in the drawing up of a

consistent policy mechanism, thereby facilitating appropriate design applications, and it is the intention in this thesis to fill this gap in the body of available literature.

2.3.1 Theoretical Perspective

A non-discriminative and pluralistic approach towards the human population has long been emphasized for the creation of an ideal public life for all in architecture and urban design studies, as explained in detail in section 2.1 (i.e. Lynch, 1981; Jacobs & Appleyard, 1987). In a similar way, appreciating the diversity of the general public has long been a central belief in the field of accessibility design studies. An impairment that may limit one's physical movement is seen as one of the individual characteristics resulting in this diversity, alongside other characteristics of the population, such as being a child or getting older. This ability to see people with disabilities as a part a of pluralistic community has resulted in a huge body of design-related literature that looks into the variety of spatial human needs and perceptions, and the desire to be included in all aspects of public life. Often, studies into spaces and their users are made with emphasis of person-environment interactions and the physical usage of the spatial environment, with the main focus on technical design specifications in architecture. However, design and evaluation studies that aim to understand the effects of those standard-based physical design specifications on both personal and social experiences are less common. Understanding how people with disabilities participate in society based on the reflexive relationship between environmental restrictions and personal capabilities related to access is important if we are to understand the needs and wishes of the disabled population related to an equitable social life.

Many scholars claim that a large volume of additional information about both the physical and social influences of environmental access on equitable human life is required to advance *the corpus of design knowledge* (i.e. Imrie & Hall, 2001; Casas, 2007; Froyen et al., 2009; Preiser, 2011; Cassim, 2013; Poldma et al., 2014). From this perspective, "what we still need to know" becomes a critical issue to be addressed in

ensuring the creation of an inclusive environment. By considering "the spatial experiences of people with diverse (dis)abilities in a specific setting or condition by which their local experiences are formed" can lead this issue to a logical argument. The spatial needs of the disabled population change according to personal characteristics, wishes, impairments and feelings, and the experienced attributes of a physical setting affect this tentative process. This interactive and changeable situation is also affected by local circumstances, including the social, cultural and politic aspects of the country in which they live. Eventually, this ever-changing and tripartite reflexive relationship between disabled people and the physical environment calls for a well-rounded assessment of the design. A study by Froyen et al. (2009) demonstrates the need for such a comprehensive design evaluation framework, suggesting an initial effort for the creation of a global model, *Universal Design Users – Built Environments Model*, which matches the varied (dis)abilities of users with particular aspects and elements of built environments.

Understanding this multifaceted and wide-ranging person-environment relationship in a comprehensive way is complex due to its ever-changing situation. The most accepted and valued method in literature is to consult with the present and future users of a particular spatial environment so as to understand this interactive process (Gleeson, 1996; Ostroff, 1997; Imrie & Kumar, 1998; Salmen & Ostroff, 1999; Imrie, 2000, Sanders, 2002; Keates & Clarkson, 2004; Froyen et al., 2009; Heylighen et al., 2013; Lid, 2013; Poldma, et al., 2014). A large body of academic work, including theoretical and empirical studies, draw attention to the weak representation of the disabled population, which challenges the creation of truly inclusive built environments (Matthews & Vujakovic, 1995; Imrie & Kumar, 1998; Heylighen et al., 2013; Poldma, et al. 2014).

Incorporating the viewpoints and voices of disabled population into the design and evaluation process is referred to generally as the *participatory design evaluation* approach, in which primary focus is on 'designing with the users' rather than

'designing for the users' (Sanders, 2002). When a study incorporates the lived experiences of users as a research directive in all phases of the research – aim, data collection and evaluation – its outcomes may prove to be valuable in providing comprehensive and reliable knowledge in the design context. Kaplan's emphasis on incorporating empirical knowledge from real-life experiences leads to advances in the scientific field through the garnering of diverse opinions (Kaplan, 1964, pp. 34-36), theoretical advances in the promotion of inclusiveness through architectural design emerges as a promising approach, incorporating goal-oriented in-depth information and specific spatial meaning for which the user is the primary source. In the following section, the role of the user in the design and evaluation process is opened to discussion.

User as an 'Expert'

Ostroff (1997) uses the term "expert" to define the strong role of a user in an evaluation of any part of a physical environment. Taking into account the diversity of human (dis)abilities and conditions within various types of physical settings, she clarifies her opinion as follows:

> A user/expert can be anyone who has developed natural experience in dealing with the challenges of our built environment. User/experts include parents managing with toddlers, older people with changing vision or stamina, people of short stature, limited grasp or who use wheelchairs. These diverse people have developed strategies for coping with the barriers and hazards they encounter every day. (Ostroff, 1997)

According to Ostroff's user-as-expert approach, user experience is seen as a first-hand source of guidance at each phase of the design process (Ostroff, 1997; Keates & Clarkson, 2004, p. 220). Garnering fundamental information from user experiences leads to the achievement of the best, most reasonable, innovative and user-centered responses to any design problem (Ostroff, 1997; Imrie, 2004, p. 279; Keates & Clarkson, 2004, p. 220). Burgstahler (2008, p. 188) suggests that many pioneering

works were carried out with the contribution of users to the design process while explaining the history of the universal design of physical spaces.

Central to both Inclusive Design (ID) and Universal Design (UD) are user evidence of daily lives and user aspirations due to their crucial impact on the creation of reliable and fulfilling design solutions that support the diverse lifestyle choices of individuals (Ostroff, 1997; Salmen & Ostroff, 1999; Imrie, 2004; Coleman, 2011; Lid, 2013). Understanding the spatial experiences of users under different real-world circumstances is crucial in any systematic and comprehensive design evaluation (Preiser, 2002, p. 21; Preiser, 2011, p. 38.2), given that experiences are affected by many factors, such as features of an experienced space, social environment, disability type and national-level circumstances. To exemplify, although there is a great deal of available data about accessibility design standards, their correct application is unlikely when familiarity with the spatial experiences of users is lacking. Additionally, they may overlook certain conditions due to the wide variety of situations in the disabled person-environment interaction. For instance, Turkish design standards offer only limited specifications for certain conditions related to surface ground design, failing to take into consideration diverse all of the design-oriented circumstances that may be experienced. Furthermore, solutions to a problem may be in conflict with the needs of others, such as wheelchair users. It should be noted here that involving numerous user/experts with diverse (dis)abilities in any one study will be unlikely, however engaging a range of individuals, especially those with extreme needs, will help to expand architects' views of the diverse population (Ostroff, 1997; Cassim, 2013).

In addition to the potential benefits to the success of a design, the direct involvement of users in all phases of the decision-making process can be considered a democratic approach that treats their diversity as a valuable element of community life, and causes them to be empowered in the social sphere. Francis (1989) expresses this point as follows:

> The process of making, managing, and changing public places needs to be an open democratic process engaging the ideas and interests of diverse individuals and groups. It is imperative that the design and management of public space remain part of the public arena. Only then can urban spaces become more fully integrated into our evolving public culture. (p. 169)

Here, Francis highlights that direct involvement in the design of a place can increase the attachment of meaning to a physical space or a social atmosphere (Francis, 1989: 155), which, in turn, can contribute to the creation of active citizens by promoting personal and psychological development (Oliver, 1996; Barnes & Mercer, 2010).

All above conceptions suggest that adopting real life experiences into the design and evaluation process result in the comprehension of various physical and social requirements of post-secondary students with disabilities. For the context of the study, it is argued that spatial criticisms from actual users of both the physical and social aspects of campus community life can contribute well to the generation of knowledge from which can be derived the required attributes and performance aspects of outdoor campus spaces. This can be considered a priority for the success of an inclusive higher education environment, and several research methods maximizing user participation in the environmental campus evaluation and design process have been utilized and developed. The following section makes a critical analysis of the design evaluation strategies used in the academic arena.

2.4 Legal Issues related to Accessibility in a Higher Education Physical Environment

Education and accessibility are among the central issues in policies aimed at catering for a more democratic campus life, since achievement in these issues promotes the right to full participation in both educational services and public life, to a significant extent. Higher education can lead easily to an increase in individual capabilities and

their level of self-sufficiency, both financially and socially, which in turn promotes and explicit increase in quality of life (Frieden, 2003; UN, 2006, p. 3; Burgstahler 2009, p. 155).

Legislative arrangements, such as laws, regulations and standards, have played a key role in creating an inclusive post-secondary educational physical and social environment in response to the needs of students with impairments. For real achievement in this regard, the perspective adopted in the decision-making process is important. Beauchamp-Pryor (2007) supports the strong link between the success of policies and the insight into human rights as follows:

> Arguably, where an individual or medical model perspective is dominant, focusing on individual impairment and functional limitation, the response towards disabled people is one based on welfare solutions of care, concern and compensation. Such policies, as evidenced in this study lead to dependency, inequality and a lack of inclusion. Alternatively, where policies stem from a social model perspective, identifying the cause of disability as resulting from attitudinal, environmental and organizational barriers, the response is one based on equality and rights, recognizing the importance of choice, control and consultation. Such policies, as proven in this thesis, lead to independency, equality and inclusion. (Beauchamp-Pryor, 2007, p. ii)

To overcome spatial problems in public life to the greatest extent possible, it is important to follow a social-based approach in the decision-making process for policy documents. In this part of the study, the provisions of international and national legal documents based on education and accessibility issues are expressed in a historical manner, showing how the development of policies changed from a medical-based perspective towards a socially based one.

2.4.1 International Legal Documents

The United Nations (UN) is among the most influential international organizations in the advancement of policies related to disabilities. It has facilitated significantly the

evolution of human rights since the 1940s when it adopted and announced the 'Universal Declaration of Human Rights' in 1948 (UN, n.d.). In the 1970s, when movements began to emerge in support of international human rights and those with disabilities, the UN facilitated the advancement of an international concept of human rights and the equal participation of people with disabilities (UN, n.d.). The first important step in this regard was the acceptance of the "Declaration on the Rights of Disabled Persons" in 1975 by the General Assembly, which proclaimed the equal civil and political rights of disabled people by establishing standards for access to services, helping to develop the capabilities of people with disabilities and accelerating their social integration (UN, n.d.). Then, in 1976, the UN proclaimed 1981 as the "International Year of Disabled Persons", after which the "World Programme of Action Concerning Disabled Persons" was adopted in 1982. With these two successive steps, disabilities were for the first time seen as being based the relationship between people with disabilities and their environment (UN, 1993). This gave strong impetus to advancing the disability approach in the formulation of legal arrangements related to the contemporary social understanding of disability.

'The UN Decade of Disabled Persons (1983-1992)' established a time limit for the implementation of norms stated in the World Programme of Action. One of the foremost achievements of the Decade of Disabled Persons was the adoption of the 'Standard Rules on the Equalization of Opportunities for Persons with Disabilities' in 1993 (UN, 1993). In particular, Rule 5 of the Standard Rules pinpointed accessibility of the physical environment, as well as education, as one of the target areas for equal participation.[5]

[5] "Rule 5 - Accessibility: States should recognize the overall importance of accessibility in the process of the equalization of opportunities in all spheres of society. For persons with disabilities of any kind, States should (a) introduce programmes of action to make the physical environment accessible; and (b) undertake measures to provide access to information and communication." (UN, 1993).

At the beginning of the 1980s, the Council of Europe (CE) and European Union (EU) also made value-laden policies supporting the developments in the UN policy structure. The Council of Europe contributed to the UN International Year of Disabled Persons (1981) with 'Recommendation 925 (1981), while the EU Commission made important contributions to the European disability policy with three consecutive action programs from the early 1980s until the mid-1990s.[6] Both the first program, the "Community Social Action Programme on the Social Integration of Handicapped People (1983-88)", and the second program, the "HELIOS I (Second) Community Social Action Programme for Disabled People (1988-92)" aimed at the exchange of information related to disability policy, including education, by promoting a sharing network system (Mabbett, 2005, p. 107). The third phase of the HELIOS program, 'Helios II (Third) Community Action Programme to Assist Disabled People (1993-96)', focused mainly on the right to equal opportunities and social integration, and made a significant evolution in the European Commission's understandings (Mabbett, 2005, p. 107). The Commission adopted the "Communication on Equality of Opportunity for People with Disabilities: a New European Community Strategy (1996)", as one of the most important and far-reaching strategic documents on disability in this regard (EU, n.d.). The document showed the renewed approaches of the Commission, having shifted from being medical to social based in various aspects of life, including education and design, and appreciating "design for all" concepts (EU, 1996).

Based on the goal-oriented provisions of the above policies, the CE and the EU prepared their action-oriented plans, with the CE's "Disability Action Plan 2006-2015" (CE, 2006) and the EU's "European Disability Strategy 2010-2020: A Renewed Commitment to a Barrier-Free Europe" (EU, 2010) promoting equal participation in

[6] Mabbett claims that the European Community's policy efforts in the 1960s and 1970s were mainly realized to address the needs of the labor force (Mabbett, 2005); hence, the main concern was the idea that disability was seen as a deficiency that could be improved through the help of medical supportive services.

education, politics, and public and cultural life, as well as accessibility to the built environment (CE, 2006). The EU Council created a powerful agenda according to which all parts of the built environment were to be (re)-designed and (re-)built to provide accessibility, safety and usability to all by 2010 (EU, 2003, p. 17).

In modern times, education and accessibility have taken a primary position on the agendas of the internal structures of all international organizations. For the establishment of all-inclusive international standards, the internationally accepted and valued *Convention on the Rights of Persons with Disabilities,* adopted by the UN in 2006, has a broad-reaching human right aspect, recognizing the importance of international cooperation in improving the quality of life of people with disabilities in every country (UN, 2006, p. 2). The Convention is founded on the principle of equal rights for all citizens in an ethical ideal of a democratic society (UN, 2006), and highlights accessibility and education as the most important issues in public life, enabling people with disabilities to enjoy fully all human rights and fundamental freedoms (UN, 2006, p. 3). In its context, disability is recognized as "the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others" (UN, 2006). Consistent with this viewpoint, the Convention a need to create inclusive physical educational environments[7] at all levels by ensuring "reasonable accommodation", which it defines as follows:

> Reasonable accommodation means necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms. (UN, 2006)

[7] "Article 24 - Education: 1. States Parties recognize the right of persons with disabilities to education. With a view to realizing this right without discrimination and on the basis of equal opportunity, States Parties shall ensure an inclusive education system at all levels … To this end, States Parties shall ensure that reasonable accommodation is provided to persons with disabilities." (UN, 2006, p. 16).

Herein, emphasis is placed upon the entailment of the right to equal access of public spaces by means of minimum design requirements for all citizens.

In conclusion, it would seem that international legislation has been consistently improved from being medical-based to a broader, more social-based approach. Accordingly, the right to education, and social and physical access to educational services, thus enhancing equal opportunities in education and full participation in the community, have become the main goals in the disability policies of international organizations.

2.4.2 Legal Documents of Turkey

Turkey's Constitution has a social law structure, and has, since 1982, stated in no uncertain terms that, "No one shall be deprived of the right to learning and education" (Article 42) and "The State shall take measures to protect the disabled and secure their integration into community life" (Article 61, TCA, 1982), although the first comprehensive legal document that reflects this Article of the Constitution, namely the 'Turkish Disability Law', was approved only in 2005.

According to the Disability Law, within seven years of its adoption, public buildings, roads, pavements, pedestrian crossings, open and green areas, sport facilities, and social and cultural infrastructural regions, in short, all public buildings, should be (re)designed to satisfy the needs of people with disabilities in accordance with the Turkish Design Standards[8] (Temporary Article 2, Disability Law no 5378, 2005). This

[8] Below are the Turkish Design Standards, prepared by Turkish Standard Institution, that are most often referred to related to accessibility specifications in a physical environment:
- TS 9111 (November 2011) The requirements of accessibility in buildings for people with disabilities and mobility constraints.
- TS 12460 (April 1998) Rail rapid transit system in urban part 5 - design criteria for facilities for the handicapped and elderly.
- TS 12576 (April 1999) Structural preventive and sign design criteria on streets, boulevard, square and roads for the handicapped and elderly in urban areas.

provision of the Disability Law focuses on the context of "reasonable accommodation" in referring to a non-discriminative right-based approach in parallel with the international policy documents. It also forces all educational facilities and services to be made accessible to all students, without discrimination.

Since 2005, the Turkish Disability Law has facilitated the significant realization of other policies (Table 1) by increasing awareness of the importance of accessibility and the right to education, like in other fields of public life. It has heralded in a national alarm call to develop inclusive measures and strategies aimed at making higher education accessible to all students, including the disabled. Referring to the Disability Law, on June 20, 2006, the Higher Education Institution in Turkey (Yüksek Öğretim Kurumu, YÖK) adopted a "*Regulation on Collaboration and Coordination of Higher Education Institutions for Persons with Disabilities* (Yükseköğretim Kurumlari Özürlüler Danişma ve Koordinasyon Yönetmeliği)" to eliminate problems related to the academic, social and physical integration of SWDs into their colleges. On August 14, 2010, this regulation was repealed, and more SWD-centered took its place carrying the same name. This has resulted in developments in the organizational structure of both national universities and YÖK, and as a result of this regulation, a Commission for SWDs has been established within the body of YÖK. In addition, the foundation of a Disability Support Office (DSO), with the role of satisfying the needs of SWDs by ensuring their full participation at all post-secondary educational facilities, has become mandatory for each university (Article 11). The Regulation defines the general provisions for the working methods and principals of DSOs in universities, and gives the university authorities the responsibility of arranging their own working principals (YÖK, 2010).

Issues related to institutional strategies for the creation of inclusive higher education across Turkey have been addressed in a series of national workshops, namely, the Inclusive Universities Workshops, which were launched in 2007 (EÜÇ, 2013; EÜÇ, 2014). Since then, such events have been organized in each national university in

collaboration with YÖK every year. These significant events ensures dialog between all stakeholders on the issue of the inclusion of SWDs in higher education in a multi-dimensional way (covering both physical accessibility and social integration), and has served as an initiator mechanism that allows all disability units, related departments, students at state universities and governmental authorities in Turkey to get involved in addressing the problems and coming up with possible solutions.

Table 1: Key policy documents about accessibility of the campus built environments.

Year	***Policy Document***
2005	Disability Law no 5378
2006	Regulation on Collaboration and Coordination between Universities for Persons with Disabilities (out of date)
2010	Regulation of Higher Education Institutions for Students with Disabilities
2010	Accessibility Strategy and Action Plan
2013	Regulation for Monitoring and Controlling Accessibility

National laws, policies and design standards, as well as collaborative efforts aimed at inclusive higher education have had an impact on increasing awareness and sensitivity in the creation of accessible built environments on campus for SWDs. Problems have been found to result from the lack of an inclusive approach to respond to the needs of students with disabilities, the lack of data and knowledge about the needs of SWDs and difficulties in the proper implementation of design specifications (EÜÇ, 2014; İnalhan and Sungur Ergenoğlu, 2011). Accessibility design standards are generally implemented in literal compliance with the legal code. Evaluations of design implementations to identify whether they respond to the real inclusion requirements and the monitoring of applications of right-based policy provisions are ignored issues, as also stated by İnalhan and Sungur-Ergenoğlu (2011), and this results in poorly designed built campus environments that make equal access to any post-secondary

educational services, activities, facilities impossible, and in turn, obstruct the real inclusion of SWDs.

Monitoring and control mechanisms have been highlighted as one of the key factors in the elimination of physical barriers in the built environment in the "Accessibility Strategy and Action Plan (Ulaşılabilirlik Stratejisi ve Eylem Planı)" of 2010. The main concern of this Plan on design applications is stated as being "*to improve the qualities of accessibility applications in accordance with technical specifications*" (ASPB, 2010). In this regard, it would seem that providing a well-defined monitoring and controlling design guide for diverse types of built environment would be insufficient. In the absence of such a legal guiding document, municipalities and public institutions, including universities, have been indifferent in their approaches, and have thereby failed to implement accessibility standards in a well-planned and holistic way. These insufficiencies in the legal basis have come to light at a time when all parts of the built environment should be allowing equal access for people with disabilities, which had been extended to July 2013 with an amendment to the Disability Law.

Prior to 2013 there had been no legal requirement related to a monitoring mechanism for the control of accessibility design applications, which is a *sine qua non* in ensuring equal access to public spaces. With the adoption of the "*Regulation for Monitoring and Controlling Accessibility"* (Erişilebilirlik İzleme ve Denetleme Yönetmeliği) in July 2013, provisions related to the constitution of commissions responsible for monitoring and controlling accessibility conditions and their working procedures and principles have been established (ASPB, 2013). The goals of these Commissions are as follows:

1. To identify, monitor and control current accessibility circumstances by means of *Forms for Monitoring and Controlling Accessibility of Buildings, Open Spaces, and Transportation Vehicles* (Table 2), which are presented as annexes in the Regulation.

2. To grant an extension of time if needed, provided that all accessibility problems are overcome by 7/7/2015.
3. To impose pecuniary penalties (ASPB, 2013).

The *Forms for Monitoring and Controlling Accessibility of Buildings, Open Spaces and Transportation Vehicles* were prepared by the "Head Office of Services for People with Disabilities and the Elderly (Engelli ve Yaşlı Hizmetleri Genel Müdürlüğü)" for the evaluation of the existing design of the built environment, including university settings. They were created based on the relevant national design standards[9] and list the existing applications, both appropriate and inappropriate, in accordance with the related design standards. Although these forms have entered into use, a clear positive result has yet to be attained.

Table 2: Form for Monitoring and Controlling Accessibility of Buildings

Ek I: BİNALAR İÇİN ERİŞİLEBİLİRLİK İZLEME VE DENETLEME FORMU

	B.19	Rampa 9 m'den uzun mudur? Cevabınız **hayırsa B.21'e** geçiniz.	Evet	Hayır	
*	B.20	Rampa 9 m'den uzun ise her 9 m'de bir, en az 150 cm x 150 cm'lik düz dinlenme alanları var mıdır?	Evet	Hayır	
	B.21	Bir rampadan ikinci bir rampaya geçiş var mıdır? Cevabınız **hayırsa B.23'e** geçiniz.	Evet	Hayır	
*	B.22	Bir rampadan ikinci bir rampaya geçişin olduğu yerlerde; en az 150 cm x 150 cm'lik düz dinlenme alanları var mıdır?	Evet	Hayır	
	B.23	9 m'de bir sahanlıklarla bölünen 30 m'den fazla uzunluğu bulunan rampa var mıdır? Cevabınız **hayırsa B.25'e** geçiniz.	Evet	Hayır	

[9] National standards used for the preparation of accessibility evaluation forms:
- TS 12576 (1999) Structural preventive and sign design criteria on streets, boulevard, square and roads for the handicapped and elderly in urban areas.
- TS 9111 (2011) The requirements of accessibility in buildings for people with disabilities and mobility constraints.
- TS 11783 (2014) Design criteria for bus stops and locations on urban roads
- TS 10551 (1992) Design criteria for car parking facilities in urban areas
- TS 4802 (2005) Public Information Symbols
- TS EN 81-70 (2007) Safety rules for the construction and installations of lifts - Particular applications for passenger and good passengers lifts - Part 70: Accessibility to lifts for persons including persons with disability
- TS EN 81-70/A1 (2005) Safety rules for the construction and installations of lifts - Particular applications for passenger and good passenger lifts - Part 70: Accessibility to lifts for persons including persons with disability

Based on above discussions, this thesis argues that architectural and urban design practices should be carried out in a holistic manner, which can be better achieved by internalizing the unified design principles rather than by evaluating designs and checking design specifications on a case-by-case basis. Hence, for the case of Turkey, there is a crucial need to make a shift from right-based policy to implementation, and this process needs to be adequately monitored and evaluated based upon the broader human rights paradigm. In the context of this thesis, at what level applications of the national design standards affect the physical environments of universities still remains an important question. HEIs may need to (re)consider their autonomy and their responsibilities in matters related to accessibility, as defined in the Disability Law and the Regulations (YÖK, 2010). In this regard, this study argues that a unified and comprehensive accessibility planning approach should be developed with involvement of real users, rather than being based only on a literal application of design standards.

CHAPTER 3

SIGNIFICANCE OF DESIGNING FOR ACCESSIBILITY AND INCLUSIVENESS ON THE UNIVERSITY CAMPUS

This chapter presents the conceptual framework of this thesis, beginning with a discussion of the importance of full accessibility to public spaces by all members of a community, with reference to the numerous man-and-environment studies penned since the 1970s. The chapter then discusses the significance of accessibility for the inclusion of SWDs in commonly used outdoor spaces on a university campus, while elaborating on the issue from physical and social dimensions.

3.1 Accessibility and Inclusiveness

Having discussed the general meaning of access to public spaces, without specific focus on any particular user group, I address accessibility of public spaces is essential for all community members, without emphasis on any specific user group. Accessibility to spaces is a significant issue for people with disabilities, since the design of physical environments in general does not take into account their needs. People with no impairment in mobility have free access to a broad range of opportunities, but this situation may be reversed for people with mobility and sensory disabilities. The physical environment is full of spatial obstacles that affect significantly life choices and desires, and in turn, the physical and social behavior of people with disabilities. At this point, accessibility becomes an issue with both physical and social aspects in the person-environment relationship. Although this

simple correlation is based on a more deterministic view, accessibility is a prerequisite vehicle towards the creation of an inclusive society.

3.1.1 Meaning of Accessibility for Inclusive Social Life

Public spaces, as commonly-shared places that allow communication between members of a community, have a crucial role in creating and retaining a participatory social life (Lynch, 1965; Francis, 1989; Carr et al., 1992, Gehl, 1987; Mehta, 2014). The concept of accessibility, as one of the essential functions of an ideal public space, became embedded in architectural and city planning studies in the 1970s (e.g. Bednar, 1977). Researches have been devoted to the development of concepts oriented towards accessibility in order to design *real* "public"[10] spaces (i.e. Lynch, 1981; Jacobs & Appleyard, 1987; Francis, 1989; Lozano, 1990; Carr et al., 1992; Gehl, 2011; Mehta, 2014). For instance, Lynch dealt with "access" as a basic component in his normative theory "*Good City Form*", while emphasizing its crucial influence on the creation of an *open, democratic* and *non-discriminative* society for all (Lynch, 1981). For Jacobs and Appleyard (1987), it is a prerequisite among the goals of the urban design manifesto, aimed at transforming the urban environment into a more human-based form.

Access is essential in enhancing a multilayered *fit*[11] between a person and the spatial environment based on physical and social aspects. First of all, it ensures every citizen who is entitled can access physically the environmental facilities that are vital for individual survival (Lynch, 1981; Jacobs & Appleyard, 1987, p. 116). The realization

[10] Francis (1989) defines the concept of "publicness" as a central issue for architectural and urban studies, relating it as one's right to use the public environment (p. 157). Supporting his viewpoint, herein, the *public* can be portrayed as an umbrella term to define a community, segregating no part (individual) of its members.

[11] Herein, *fit* refers the optimal balance between diverse needs, choices and wishes of the population and the characteristics of the physical environment, in the light of Lynch's normative theory (1981). It will be explained more broadly in section 4.3.2.

of physical access, especially for people with impairments, depends mostly on the success of technical design dimensions, although accessibility is not exclusively a technical design concern, in that social dimensions also need to be embodied, comprehending its many-sided meaning for public-space quality. There is a huge body of literature confirming the accelerating effect of physical accessibility to the social experiences of the individual (Lynch, 1981; Farrington & Farrington, 2005; Lid, 2012; Poldma et al. 2014). The recent study by Poldma et al. (2014), for instance, suggests: "…spatial designs may support people with disabilities in subtle ways that can either facilitate or hamper their experiences and affect their social experiences" (p. 214).

Based on above viewpoints, access refers to not only one's free access to the vital necessities in the spatial environment, but also an essential means of experiencing real *participation*, *involvement* and *inclusion* in social life. That is to say that direct, active and independent involvement in a group or an individual activity in a public space is possible when physical access is realized holistically. Francis states the following on this issue: "Public spaces are participatory landscapes. Through human action, visual involvement, and the attachment of values, people are directly involved in public spaces. People claim places through feelings and actions" (1989, p. 148).

There is a strong associative link between the physical and social dimensions of access: an individual *presence* can secure *direct physical* and *visual involvement* in a space, which results in the *connectedness* of the user to the behavioral pattern of that space (Lynch, 1981; Francis, 1989). Experiencing connectedness within a spatial environment is an indicator of existing efficient environmental support for the *inclusion* of individuals in the culture of the life that is particular to that space.

The expression "Openness of public spaces" best incorporates all meanings of access, referring to a good public environment that is open to all members of the community of different kinds, without threatening the balance of public life by exclusion, by which public life can be more *responsive, meaningful* and *democratic* (Lynch, 1965; Lynch,

1981, p. 116; Jacobs & Appleyard, 1987, p. 116; Carr et al., 1992). Designing the physical environment on a more human scale with facilities accessible to the entire community would reflect an inviting and open physical environment for all, encouraging social interaction by means of the physical openness of space. Accordingly, we, as designers, should consider the capacity of the spatial environment together with the ability people to access and become involved in opportunities and activities. The degree to which one may participate in a range of activities offered in a public spatial environment may determine its level of inclusiveness (Mehta, 2014, p. 58).

To achieve inclusiveness for the entire community on an equal basis, the diversity of people should be appreciated in the manner of a pluralistic community (Imrie, 2004). The population has diverse and dynamic needs, and these change throughout the lifespan of a person as a result of a broad range of factors, such age and impairment. Lozano (1990) states that responding to the diverse wishes and choices of the individual in a spatial environment has the highest potential to achieve a successful community design[12] that guarantees a degree of equality among community members (Lozano, 1990, pp. 132-133). In a concise expression, "*a diversity of people requires a diversity of built environments*" (Lang, 1987 cited in Lozano, 1990, p. 143), and this is related closely to the success of the balance over the equitable use of the spatial environment for each community member.

Right to Access as a Social Justice

Hay (1995), in his discussion of equity, fairness and justice in geography, identifies "access across space" as a critical and widespread issue in achieving *social justice*. The fact that the physical environment is full of spatial obstacles equates greatly to an

[12] In using the term "community design" rather than "urban design", Lozano (1990) focuses on human experiences and the organization of human communities in both larger urban areas and in small settlements, like university campuses, for a good urban- thereby community- life.

infringement of the civil liberties of people with disabilities (Imrie & Hall, 2001). Deficiencies in the design of the built environment, and, in fact, omitting the spatial perceptions of users with disabilities out of the design process, exhibits the prevailing attitude towards them, to some extent. In this sense, physical barriers in the built environments can be considered visual symbols of (*in)equality* and (*in)justice* for people with disabilities. Although people's needs are diverse and may change according to their ages and with the onset of physical or sensory impairments, their rights to access remains constant.

Focusing on accessibility, participation in spatial activities by way of physical access is not enough in the equal distribution of justice among community members. In comprehending profoundly the equal participation of people with disabilities in all ranges of proposed public opportunities in a space, the sharing of responsibilities to modify and change the essential spatial attributes has been emphasized on many occasions in literature. In urban design studies, the perceived "control" implies a sense of individual or group ownership or stewardship, and this has been highlighted when addressing the level of perceived responsibility related to a place (Lynch, 1981; Francis, 1989, p. 158). The participation of people with disabilities in decision-making processes in all phases of the creation of the built environment can give them the responsibility of suggesting essential spatial attributes that will allow their full access within a space. This method of creating an environment results in advances in the empowerment, self-confidence and self-esteem of people with disabilities in community life (Oliver, 1996).

Accessibility is *a sine qua non* in any study of social inclusion, and in turn, social justice. Farrington and Farrington (2005, p. 1) define accessibility as the central issue in social inclusion, and thereby the social justice agenda, having discussed the accessibility concept and its inter-relationships with these broader concepts as a mainstream policy goal:

> … greater social justice cannot be achieved without greater social inclusion, which requires that people have access to a range of activities regarded as typical of their society; greater social inclusion requires greater accessibility which often (but emphatically not inevitably) implies mobility and transport use. (Farrington & Farrington, 2005, p. 2)

Based on the above discussions, this study considers the outdoor spaces of higher education facilities as open to all members of the higher education institution, including students with disabilities. Such an approach goes beyond only the physical usage of the environment (physical behavior), focusing rather on the participation of SWDs in educational, social and cultural life activities (social behavior). This study asserts that this approach is essential in the creation of an *open, democratic* and *non-discriminative* society, and thereby the *participation*, *involvement* and *inclusion* of SWDs in campus life. The intention here is to demonstrate the strength of the relationship between accessibility to the spatial environment and inclusiveness in campus communal life within the overall goal of justice in post-secondary education.

3.1.2 Design Philosophies

The concern about the reciprocal relationship between people with disabilities and their environment has led to the birth and growth of accessibility-centered design philosophies, among which 'Universal Design (UD)' (NCSU, 1997) and 'Inclusive Design (ID)' (Clarkson et al., 2003), are the most valued and accepted around the world, with missions based on social inclusion through accessibility. They, in general, outline the process in the creation of products and physical environments that serve for people with the widest range of abilities and operate within the widest possible range of situations. Although, the concept of "barrier-free design" has a much earlier basis (Bednar, 1977), UD and ID have gained greater acceptance among scholars of architecture and urban design since they are deep-seated and value-laden design concepts that highlight issues of "right to access" and, in turn, "inclusiveness" for *all* in community life.

Universal Design[13] is defined as "*the design of all products and environments to be usable by people of all ages and abilities to the greatest extent possible*" by the North Carolina State University (NCSU) (Story, 2011, p. 4.3, citing Connell et al., 1997). UD and its seven design principles (Table 3) was penned in 1997 at NCSU in the United States (Ostroff, 2011, p. 1.5), and is seen as a social movement that challenges disabling values and attitudes of society, dealing with the integration of people with disabilities into society by making products, environments and communication systems usable to the greatest extent possible (Iwarsson & Stahl, 2003, p. 62; Imrie, 2004, p. 280; Imrie 2012, p. 874). Through this social movement, it denotes a process for the realization of *democracy, equity* and *citizenship* in public life (Iwarsson & Stahl, 2003, p. 62).

Table 3: Universal Design Principles (NCSU, 1997)

Principles		***Descriptions***
Principle 1:	Equitable use	The design is useful and marketable to people with diverse abilities.
Principle 2:	Flexibility in use	The design accommodates a wide range of individual preferences and abilities.
Principle 3:	Simple and intuitive use	Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration level.
Principle 4:	Perceptible information	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
Principle 5:	Tolerance for error	The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Principle 6:	Low physical effort	The design can be used efficiently and comfortably and with a minimum of fatigue.
Principle 7:	Size and space for approach and use	Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

The social emphasis of UD advances its far-reaching totemic status in literature (Imrie, 2012, p. 874), with the focus of its seven principles being the full accessibility to all parts of the built environment, ranging in scale from products to buildings and urban

[13] The term "Universal Design" was first used by US Architect Ron Mace in 1985.

spatial settings. The reason behind the excessive use of the UD concept and its design principles in both theoretical and empirical studies may be a result of definition of the seven principles in a concrete and rule-based way, which facilitates their easy adoption into the functional attributes of the design. There have been many recent attempts to address the insufficiencies of the UD notion in its design guidelines (D'Souza, 2004; Preiser, 2011; Durak, 2011; Imrie, 2012; Lid, 2013) in terms of (1) its theoretical aspect; and (2) the way the two-way relationship between disability and design is comprehended. For the first stance, D'Souza describes why UD should be developed theoretically:

> Given the popularity, Universal design still remains largely atheoretical. The researchers of Universal design do not explicitly affiliate themselves to any form of theoretical paradigm. One of the reason is perhaps because Universal design is a melting point between cross paradigms … In this sense Universal design can come under functionalist paradigm (because it caters to utility), pragmatic (because it is instrumental in nature), positivistic (because it strives for universal principles), normative (because it prescribes certain rules) and critical theorist paradigms (because it gives voice to the oppressed). (D'Souza, 2004, p. 3)

In pursuit of the above discussion, D'Souza states that although the word "universal" refers to a set of principles that are *stable, timeless* and *value free*, he puts forward several instances in which the universals do change, are time bound and value laden (D'Souza, 2004, p. 8), which frees it from a positivist paradigm. For him, "*Universal design follows a critical theory paradigm in its conception and knowledge generation*" (D'Souza, 2004, p. 8). That is to say, its powerful position in the disabling of environmental barriers is the most facilitating aspect of its multi-layered development.

In parallel with D'Souza's viewpoints, Imrie (2012, p. 874) points out that there is a need to study the development of the theoretical and conceptual content of UD and its underlying principles. For Imrie, studies tend to consider UD principles to be the best problem-solving model; however, to achieve an inclusive environment, it is essential to enhance conformity in the understanding of the needs of disabled people related to

spatial access by focusing on the evidence-based framework of user interactions with their environments (Imrie, 2004, p. 279; Imrie 2012, pp. 873- 874). In the same manner, Lid's criticism of UD is that its principles are challenging in seeking the relationships between disability and design in its theoretical aspect, although appreciating its democratic potential in recognizing all people as equal (Lid, 2013, p. 203). He highlights the need to generate knowledge from a number of user perspectives and experiences:

> "Both a theoretical and empirical approach to Universal Design should be situated in disability as a dimension of human plurality. If not situated in different embodied perspectives, UD risks being nothing more than a new and perhaps slightly more inclusive minimum standard for inclusion." (Lid, 2013, p. 213)

The environmental component is not constant, on account of the ever changing worldwide differences and societal ambitions (Iwarsson & Stahl, 2003, p. 63). As a result of these alterable situations, to make each part of the built environment accessible for every member of a community in an equal and timeless manner would appear to be rather utopic, as emphasized in many studies (i.e. Lynch, 1981; Imrie, 2004, p. 282; CABE, 2006). That said, the integration of spatial experiences into the design process can overcome challenges to the universalism of the UD principles, and can also contribute to the development of the general UD philosophy. Moving away from design for universal use, offering various choices in a balanced way when single design solutions are unable to respond to the diverse spatial needs of the users is a valued idea (Lynch, 1981; CABE, 2006), and the Inclusive Design (ID) approach looks into accessibility from this perspective. ID is based on a design process that looks for inspiration in design values on the basis of the reciprocal relational process that exists between the designer and the people who use a space (Imrie & Hall, 2001; Clarkson et al., 2003; Imrie, 2004, p. 283; CABE, 2006; Cassim, 2013). In both the ID and UD approaches, the designer's approach to finding balance when faced with a diversity of spatial needs during all phases of the design process is crucial in the creation of

inclusivity. ID is a United Kingdom (UK)-oriented design philosophy that, like UD, has gained global respect in all fields of design around the world. The Commission for Architecture and the Built Environment (CABE) in the UK defined five principles of ID, as shown in Table 4. When comparing ID principles with those of UD, it can be seen that the ID guidelines are much broader than the more clean-cut and specific design principles associated with UD.

Table 4: Inclusive Design Principles (CABE, 2006)

Principles		***Descriptions***
Principle 1:	Inclusive design places people at the heart of the design process.	You should ensure that you involve as many people as possible on the design.
Principle 2:	Inclusive design acknowledges diversity and difference.	Good design can be achieved only if the environment created meets as many people's needs as possible.
Principle 3:	Inclusive design offers choices when a single design solution cannot accommodate all users.	By applying the same high design standards to meet the access requirements of all users, a design embraces everyone on equal terms.
Principle 4:	Inclusive design provides for flexibility in use.	Meeting the principles of inclusive design requires an understanding of how the building or space will be used and who will use it.
Principle 5:	Inclusive design provides buildings and environments that are convenient and enjoyable to use for everyone.	Making environments easy to use for everyone means considering signage, lighting, visual contrast and materials.

Whether focus is on more normative/rule-based design than those that are broader or more specific, the two approaches represent the absolute primary sources for accessibility studies. However, when local disability experience concerns are brought to the table, legal provisions, the way architects and local authorities approach the implementation and monitoring of legislation and design standards, and the level at which the voices of the disabled are heard concerning their needs are among the most crucial concerns influencing the accessibility of a physical environment at a nationwide level. Accordingly, the body of related literature needs to be expanded with studies that identify a powerful relational model that involves every aspect of the issue, including the designer, user and local circumstances. There have been a number of studies stating the importance of incorporating user experiences of disability in a

space, especially in the case of different national circumstances, in the development of design perspectives. For instance, in her study of the spatial experiences of children with disabilities evaluating primary school architecture in Turkey within the notion of UD, Durak (2011) demonstrates the deficiencies of the UD principles in comprehending the design of primary schools for the inclusion of children with disabilities. In an Indian case, Khare et al. (2012) offer five UD Indian principles (2011), being *equitable, usable, cultural, economy and aesthetics,* to be addressed in an interdisciplinary collaborative development process.

In summary, designing a space that is fully accessible to all of its users, ensuring equal opportunities for all in community life, is a common goal in both the UD and ID design concepts. This study is nourished in each phase by the UD and ID design perspectives and their underlying principles. Rather than establishing a discussion that is constructed on one of these concepts, both are utilized as supportive sources, validating the outcome of the study. In this way, I believe that the best contribution can be made to literature through the knowledge generated from user experience at a national scale. The following section makes a comprehensive explanation of the need to understand spatial experiences in any effort to create a successful fit between man and his environment.

3.1.3 Fitness in Person-Environment Relation

The fit between the needs of person and their experienced physical environment has been one of the main concerns in person-environment studies since the 1960s. Studies in this area tend to indicate that the physical environment influences the behaviors of people in a definite way (D'Souza, 2004, p. 7). In the embodied notion of disability and citizenship, referring to the modern right-based disability approach explained in detail in the first chapter, the fact that a handicap would emerge when spatial environment does not fit the human needs is an unquestionable idea.

In the 1960s, person-environment studies focused predominantly on social issues, when the value of "community design" was seen as a crucial concern among design professionals in response to the poorly designed environments (Jacobs & Appleyard, 1987, p. 114). However, at the beginning of the 1980s, a shift of focus occurred from social engagement to formalism, which resulted in a lack of knowledge and indifference among architects and urban planners about local needs and the requirements of the individuals using the spatial environment (Jacobs & Appleyard, 1987, p. 114). In the 21st century, attempts were made by researchers and important research communities, particularly the International Association for People-Environment Studies (IAPS) and Environmental Design Research Association (EDRA), to answer such questions as "Where do person-environment studies stand today, and what for the future?" and "What are the strengths and weaknesses of current literature in terms of theoretical and methodological issues within people-environment relationships?" The issue of the *Journal of Environmental Psychology* entitled "*Environmental psychology on the move*" laid these questions out on the table, to be taken up by Uzzel and Moser (2009, p. 308), who highlighted that recent studies tended to address issues of "quality of life" and "sustainable development" by looking at the multifaceted relationship between the people and their living space in a specific environment. Recently, studies addressing complex and social-centric contexts have emerged as a challenging starting point in the building of new theories and approaches for the realization of quality in community life (Uzzell & Moser, 2009, p. 308).

In person-environment studies, accessibility is among the most important concepts within the nature and concerns of the quality of public life and the social inclusion of those with disabilities, as stated in section 2.1.1. The relationship between the built environment and the spatial experiences of people with disabilities has long been of interest in both theoretical (i.e. Iwarsson & Stahl, 2003; Webb et al., 2011) and experimental (i.e. Staeger-Wilson et al., 2012; Heylighen et al., 2013) works. Ensuring quality of social life for all through accessibility depends on a developing a comprehensive understanding of this dual relationship, which is diverse, complex and

ever-changing in connection with the aspects of both personal and environmental contexts and circumstances (Webb et al., 2011, p. 43.1). In this regard, accessibility must be analyzed in both its personal (based on experiences) and environmental (based on spatial environment) components, and in a holistic manner (Iwarsson & Stahl, 2003, p. 57). The need to investigate social contexts in association with lived physical experiences is given particular emphasis in the study of Poldma et al., which aimed to understand accessibility needs of people with disabilities in relation to their social experiences in a commercial public space (2014, p. 208). They authors state:

> Often studies on building spaces and their occupants are conducted from the perspective of person-environment interactions, with an emphasis on the psychological effects of the physical environment on human behavior (Altman & Christensen, 1990; Altman & Zube, 1989; Weiss & Moser, 2003), and often these psychological effects are causal explanations for behavior. However, less understood are the social constructions (Berger and Luckmann, 1966) that govern spaces and their occupants as these are mediated by the physical spatial characteristics themselves. (Poldma et al., 2014, p. 208)

In the 1990s, in a cause-effect relationship, design philosophies such as "Universal Design" and "Inclusive Design", and corresponding concepts such as "Design for All" and "Barrier-Free Design" emerged, and gained amid the lack of insight among architects related to the complex and reciprocal relationships that exist between people with impairments and the built environment. These design philosophies played a crucial role in the development of a broader awareness of the insufficiencies of architectural field that regularly prioritizes aesthetic issues (Imrie, 2004, p. 281).

Today, evaluations of the links between the built environment and individual physical and social experiences are still rare in the field of modern architecture (Imrie, 2004, p. 281; Heylighen et al., 2013, p. 7), and this is also valid in the case of Turkey. The way architects approach the design of all types of built environment tends to fall short of integrating the local needs of people with diverse (dis)abilities into the design. Still today, all parts of the environment are designed for the able bodied, which results in a

lack of fit in the reciprocal relations of a person and their environment. It reflects the dominance of the individualistic understanding of disability in the mind rather than the modern conception of disability that implies the viewing of the population in a pluralistic way. Imrie explains this issue as follows:

> The most influential architectural theories and practices fail to recognize bodily and physiological diversity, and there is a tendency for architects to design to specific technical standards and dimensions which revolve around a conception of the 'normal' body. For most architects, this is based on classical conceptions of the fit and able body. (Imrie, 2004, p. 281)

In parallel with Imrie's statements, the needs of people with different levels of physical and physiological ability are reduced to a standard design guideline in which the minimum compliance standards, establish by legislation with no consideration of the diverse bodily experiences of the design, are followed. Heylighen et al. (2013) and Staeger-Wilson et al. (2012) serve as good examples of studies in which there is an empirical recognition of the full sensory role of the human body in experiencing architecture. The former study claims that designing according to an abstracted system of proportions or measurable aspects cannot completely satisfy the needs of users with disabilities in accessing the full opportunities provided in a space; while the second study proves that respecting the disability experience leads to high quality design, permitting the use of all, without discrimination (Staeger-Wilson et al., 2012, p. 37).

In short, there are two interactive but complicated factors that influence the construction of a person-environment fit: (1) personal (i.e. disability, preferences) and environmental factors (i.e. site, resources), which are ever-changing and timeless attributes that are particular to spatial usability (physical and social experience of a space); and (2) design approach. In other words, the features of the person-environment relationship are in a continuous state of change according to contextual and circumstantial factors, and addressing social-centric contexts when assessing these two factors offers a challenging starting point for the development of user-centered

design perspectives. Accessibility related studies, as environment-behavior constructs, should take into account the *real* spatial experiences that are particular to the studied place, leading to the creation of a more human-centered culture of social life, not just for people with disabilities, but for all. In line with the scope of this study, the circumstances of accessibility within the open spaces on campus need to be evaluated and interpreted within their own case, after which, steps can be taken in the design that lead to form of innovative development in the spatial environment.

3.2 Accessibility of Public Outdoor Environments in Higher Education

This section focuses on the development of a truly educative and collective dialogue among all campus members, including SWDs, related to the accessibility of the outdoor environments of a university campus. Having discussed the contribution of a university education to the students in its broadest sense, this section dwells upon the right to education through inclusiveness in campus life. It advocates that inclusive educational environments rely heavily on a holistic accessibility planning process that includes a performance evaluation of the campus built environment.

3.2.1 Right to Education and Inclusive Educational Environments

Higher education is a critical life stage for all post-secondary students, including those with disabilities, enhancing both formal and causal educative training. While the former refers to the obtaining of a higher level of professional training in preparation for the labor market, the latter is important for the development of an adult identity as a result of the increase of social interactions (Timmons, 2009, p. 234; Gillies & Dupuis, 2013, p. 199; Riddell & Weedon, 2014, p. 38).

Beyond its formal meaning, education should be treated as an ongoing factor of life involving a learning process that is integral with community experiences (Carr &

Lynch, 1968, pp. 1277-1278). Responding to this conception of education, Simons and Masschelein (2009) state: "… the university can be regarded as a space and time to constitute a public by gathering people around matters of concern, and to make something a public concern for people" (p. 204). This collaborative community culture can result from the securing of equal opportunities for social interaction in which individuals who engage in post-secondary education can learn valuable social skills.

Putting democracy at a central position in education, Dewey (1916) studied the role of training through an interactive social environment. For Dewey, the basis of democracy is founded on the sharing of life experiences, which leads to a truly educative and collective dialogue among community members in social life (Dewey, 1916, pp. 19, 87). He supports this belief with the claim that "*We never educate directly, but indirectly by means of the environment*" (1916, p. 19). From this perspective, social life is a *sine qua non* condition for the efficiency of higher education, and based on this democratic notion of education, Dewey states which attributes of the physical environment should be present:

> It is the office of the school environment to balance the various elements in the social environment, and to see to it that each individual gets an opportunity to escape from the limitations of the social group in which he [sic] was born, and to come into living contact with the broader environment. (Dewey 1916, p. 20)

Dewey implies that democracy in education can be enhanced by a both physically and socially open-for-all environmental setting. In this sense, a truly educative atmosphere depends on the total inclusion of all students in the spatial environment, and that it is the primary responsibility of higher education institutions to create such an all-encompassing formal and causal educative environment.

The achievement of full inclusion in higher education can be considered a comprehensive and multi-layered issue, and so a unified strategy needs to be implemented if the creation of a sustainable inclusive social environment on a

university campus is to be ensured. As covered in detail in section 3.2.2, this strategy should encompass a range of subjects, including 1) *attitudinal approaches* (e.g. understandings of all stakeholders, social relationships*)*; 2) *educational structures* (e.g. accessibility of educative documents, instructional sources); and 3) *environmental factors* (e.g. physical accommodation, informational access). For a successful outcome, the entire system should be established simultaneously, as many studies into the design of built environments in higher education shown how environmental factors work as a catalyst in the transformation of the entire structure into one that is more inclusive (e.g. Heylighen et al., 2006; Khalil et al., 2012).

The design of outdoor campus spaces is an important issue, since it should integrate the three forms of outdoor activity put forward by Gehl (1987), being necessary, optional and social. Gehl suggests that a high spatial quality in the public outdoor spatial environment is contingent on the success in incorporating those three activities, and his framework for assessing the functional quality and sociability of public space corresponds well with the meaning of an outdoor campus environment. Outdoor spaces are made up of a variety of elements for circulation, use and approach, such as streets, all types of paths, and green areas for sitting, socializing and sport activities. According to Gehl, activities such as walking, standing, sitting, seeing, hearing, talking, playing or other community activities, which make outdoor environments particularly attractive and meaningful to be in, are also the most sensitive to the quality of the physical environment.

On large university campuses, the outdoor environment serve as interactive communities where students can meet and get to know each other, being much more than only transition areas. This facilitates interaction among the students, especially new students, and advances a powerful communication system that then results in involvement on campus. Students somehow escape from the weightiness of education, and may consider outdoor spaces as places of excitement, either individually or collectively. This is also a critical issue for SWDs, as inclusion in such spaces can lead

them to be happy and satisfied in their educational environment if they can get involved and feel as though they belong. Accordingly, this study sees the outdoor campus spaces between buildings as a limited urban environment that is in common use for both learning and growing throughout the education process. It should serve many functions, and should provide many opportunities and services in supporting the growth of SWDs on an equal basis. In this respect, full access to common outside areas can be seen as a crucial aspect of full participation in general campus life, allowing engagement, whether individually or collectively, within the outdoor spaces.

The level of physical accessibility affects not only the level of equitable use by SWDs, but also gives students, faculty members and staff at the university an idea of what is required for a pluralistic educational and social life within a campus community (Heylighen et al. 2006; Weinkauf, 2002 cited in Timmons, 2009, p. 234). All users of campus may become more conscious, responsive and engaged in the matter of diversity, and in improvements to the design of campus spaces, and the potential benefits may extend far beyond the campus community, leading to societal progress (Powell, 2013, p. 42) in all aspects, whether physical, intellectual or social.

3.2.2 Holistic Accessibility Planning Process

Although accessibility is seen to be limited to the physical attributes of spaces, it also exerts a strong influence on inclusion through the enhancement of participatory community life. It cannot be said that a spatial environment that is accessible to users leads automatically to social inclusion. Bringing about transformations to the lives of disabled people and restoring their dignity and independence cannot be achieved only through the implementation of user-friendly design. Imrie (2004) highlights the need for a fully comprehensive and collaborative process in the creation of an inclusive post-secondary education environment, as without the development of a social or political program for change as the primary goal, the success of the adopted inclusive design approaches will have only limited success (Imrie, 2004, p. 283). While

architectural studies, legislation and higher education institutions all emphasize the need to provide equal access to university programs and services for SWDs, the means and processes by which institutions provide equal access to the spatial environment are not clearly delineated. In such a process, the social and political program, as well as architectural and planning decisions, should be well and comprehensively developed at the outset, since "*architecture is pre-determined by political and economic power, including laws, statutes, codes and corporate clients*" (Knesl, 1984 cited in Imrie, 2004, p. 283). The success of accessibility planning relies significantly on a collaborative and integrative institutional approach (Figure 2).

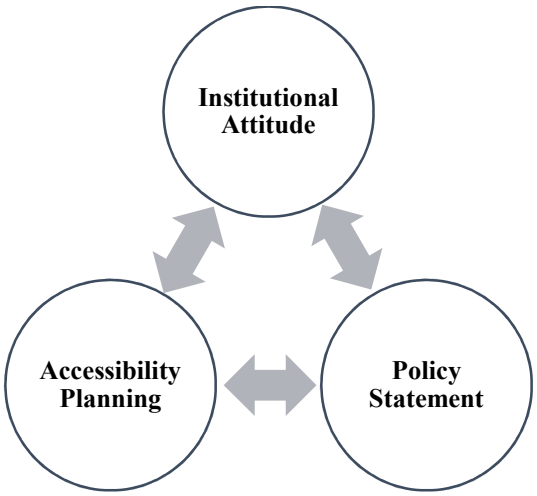


Figure 2: Collaborative and integrative institutional approach for the success of accessibility planning

The selection of an accessible campus is critical to the long-term success of SWDs looking to continue higher education. The choice of a disability friendly campus "*entails a great deal more investigation and consideration than the typical checklist of college attributes and amenities that most non-disabled students consider*" (Wilson et al. 2000, p. 38 cited in Navicky, 1998). This requires the assessment of the goodness

of the general "campus climate" (Wilson et al., 2000), an umbrella term to describe a campus atmosphere, with a good example being one that accepts fully students with diverse physical and learning abilities. To enhance an all-around livable campus climate, students are considered within the planning process and are encouraged to participate fully in a variety of campus-life activities (Wilson et al., 2000, p. 38). In this way, the accessibility of an inclusive campus climate can be enhanced not only physically, but also perceptually, which connects with the success of the tripartite system shown in Figure 2.

In the light of this tripartite system, a holistic accessibility planning process is an ongoing strategic planning route that includes seven interlinked sub-stages:

1. *Establishing an institutional policy statement with the goal of developing an inclusive higher education environment, involving also the accessibility of the spatial environment.*

The realization of this main goal depends on the adopted disability approach. I believe that an embodied notion of disability that covers both medical and social constituents is crucial for optimum accessibility and full social recognition. This way of looking at the issue responds well to the issue of how accessibility deficits might be identified and addressed in an ongoing way.

2. *Obtaining data about the demographic situation.*

This is one of the initial phases of an accessibility study in which the main concern is the identification of disability groups and their personal disability experiences in terms of their functional abilities and limitations in their engagement in activities. Access to wide-ranging demographic information about the SWD population is essential when aiming to establish a set of fundamental priorities and guidelines in response to the task requirements on the quality of services in the university (Da Silva, 2010, p. 232).

3. *Understanding the dynamics of the environment in terms of its overall usage/ Acknowledgement of the physical and social dimensions of the usage of the outdoor environment.*

To create an inclusive environment, architects should focus on the dynamics of community life, as well as means of technical design. This thesis deals with accessibility as a means of social inclusion, implying the right to equitable access for all. True success depends on the success of these two concepts.

4. *Understanding whole user spatial needs.*

Regular consultations with users about their diverse spatial experiences would contribute to advances in the design and spatial renovation. As stated in section 2.3.1, beyond complying with the technical design standards, valuing user experiences of disability can guide the design. Herein, the changing needs of users depending upon their impairments should be taken into account.

5. *Conducting campus accessibility analyses to understand the existing situation and the factors that hinder or support the equitable access of users.*

This process is a central role in a performance evaluation of a physical campus environment. A comprehensive analysis of campus spaces may also contribute to identifying accessibility priorities in the field.

6. *Design proposal for an inclusive campus with the participation of all stakeholders (including SWDs).*

Different aspects of campus accessibility (physical and social situations) and the various perspectives of all stakeholders, especially SWDs, should be integrated into the design process.

7. *Putting the plan into action step-by-step, according to the identified accessibility priorities.*

There is a need to scrutinize the existing institutional process to ensure ongoing accessibility on campus. As a part of this process, it is essential to look at methods by which accessibility deficiencies may be identified and addressed in an ongoing way. This strategic approach, based on continuous accessibility evaluations, will be the topic of focus in Chapter 4.

CHAPTER 4

AN ACCESSIBILITY PERFORMANCE EVALUATION METHOD FOR THE UNIVERSITY CAMPUS

This section of the thesis serves as a link between chapters, beginning with a presentation of the studies in literature of accessibility performance evaluation methods with particular focus on university campus spaces. I address both the conceptual and strategic perspectives of the relevant studies, with the central concern being how the disability experience is able to be well comprehended. There is a large body of architectural work emphasizing a participatory approach while conducting of evidence-based studies, and this chapter highlights the importance of user perception and integration into design studies. Valuing this participatory approach within design evaluation strategies, I explain the methodological approach and procedure followed in this thesis. Having accepted Lynch's normative theory as the conceptual basis of this study, I present descriptions of its performance dimensions while interpreting them in the context of accessibility.

4.1 Performance Evaluation Concept

Performance Evaluations (PE) have gained popularity as a prerequisite of *good design,* based on explicitly stated performance requirements related to the built environment and the people who live in it (Preiser, 2002, p. 21). PE developed out of the Post-Occupancy Evaluation (POE) approach of the 1960s, at a time when man/environment studies were emerging (Preiser et al., 1988). Since then, the quality of public space and

its related concepts, being *access* and *equity*, have taken a lead role in academic studies in the field of architecture and city and urban planning with regards to public satisfaction (i.e. Lynch, 1965; Carr et al., 1992; Mehta, 2014). POE is a performance assessment method that has been used extensively in the evaluation of performance attributes for any user group in a spatial environments. One interpretation of a post-occupancy evaluation was presented by Preiser et al. (1988):

> … the process of evaluating the spaces in a systematic and rigorous manner after they have been occupied for some time. It can be used for any types of spatial environment for any objectives. It generally encompasses to a comprehensive review of the use. (p. 8)

POE, in this manner, can be considered an evidence-based case study method tool, and it has been utilized in the evaluation of occupied spaces using diverse survey methods, such as those of a qualitative and quantitative nature. Since it a POE occurs after a space has been used, it can help researchers assess how well the space performs in terms of user satisfaction according to a number of predetermined criteria. The *Performance Evaluation* (PE) framework shares a similar goal as POE, but rather than being based on an after-usage evaluation, focus in PE is on all-inclusive phases of the spatial design, construction and usage (Preiser & Vischer, 2005).

One main concern of the research agenda in the "Performance Evaluation" concept relates to the development of practical tools for quantifying and providing *sustainability* of all parts of the built environment throughout its life cycle. In this sense, literature has expanded to a perspective of "green design" and has attributed more to considerations of sustainability. There has been a growing tendency in studies of initial performance evaluation tools to concentrate on designing "green" or "greener" buildings, which facilitates incremental environmental improvements (Todd, 2001, p. 326). Energy performance is certainly a significant issue in the PE concept in the national and international contexts when sustainability is concerned; however, sustainability is a broader context with social, cultural and environmental

dimensions, as well as ecological and economic aspects (Magis & Shinn, 2009, p. 15; Cooper, 1999; Cole et al., 2000 cited in Todd, 2001, p. 326; Sinopoli, 2009; Casas, 2007).

The ideal of sustainability is secured within a community when all members of the community are provided with equivalent environmental, social and economic qualities (Charter, 1994; Litman & Burwell 2003; Steg & Gifford 2005 cited in Casas, 2007, p. 463). For the maintenance of sustainable public life, it is important to give all community members the right to access and use facilities with those qualities; as failing to do so will result in social exclusion, which can lead to a non-sustainable environment (Bhalla & Lapeyre, 1997).

The development of social life takes an important place in the advancement of a sustainable public environment. As emphasized in existing literature, although accessibility relates to the physical aspects of the environment, it is one of the prerequisites for the sustaining of equal opportunities in social life (Oliver 1996; Casas, 2007). Casas (2007) supports this perspective by stating "Understanding social dimensions (e.g. transport equity) is an important aspect of sustainable development. This holistic perspective allows the use of accessibility as a tool to identify disadvantaged groups" (p. 463).

Ensuring equal access to the facilities and services offered in the built environment plays a substantial role in meeting the environmental, social, and economic dimensions of sustainability. For its realization, accessibility demands the built environment to be designed in a way that all people have equal opportunities to participate in all public life events. At that point, it can be noted that "accessibility" has a catalytic role in the sustainable progress of social life (Casas, 2007; Hay, 1995), in that the accessibility of the environment is related closely to the ability of the built environment to increase the opportunities available to people, while reducing limitations on access.

There are a number of value-laden performance assessment certification systems in the world that are followed by HEIs. The LEED (Leadership in Energy and Environmental Design) system in the United States and the BREEAM (Building Establishment Environmental Assessment Method) system in the United Kingdom are among the most well-known, both of which involve an evaluation of the effects of environmental conditions, mainly in the interest of energy saving, the results of which are taken into account in the design, programming and equipment selection for the facility. Designers and researchers have been required to conduct accessibility centric studies in the development of performance-evaluation methods for higher education spaces in a holistic manner, since a more experimental effort is needed to better understand the design dimensions that are best suited to the needs of post-secondary SWDs. The study of Staeger-Wilson et al. (2012) offers a clear demonstration of this approach, highlighting how pursuing LEED certification can lead to an inclusive environment in the subject university. To realize this and make it applicable for future projects, it focuses on an evidence-based framework that takes into account the disability experience in programming and equipment considerations, thereby promoting a high quality design for all (Staeger-Wilson et al., 2012, p. 37). It is obvious that these social dimensions of a spatial analysis should be integrated also into the globally adopted built environment certification systems, and can also be a part of a sustainable development process.

For this study, it is necessary to adopt a broader, more holistic performance evaluation approach to the issue of accessibility rather than only relating it only to energy usage. To achieve a holistic performance evaluation of all parts of the built environment, including open public spaces, as well as ecological aspects, factors related to accessibility and the social inclusion of all members of the community, including those with diverse (dis)abilities, should be integrated simultaneously into the design assessment perspective, being an interactive process in which all related contexts have a significant role (Preiser, 2011; Sinopoli, 2009).

4.2 Accessibility Performance Evaluation

The constant monitoring of spaces is extremely important in terms of maintaining a satisfactory level in the design for present and future needs. That is, performance evaluations are essential during both the occupancy and the design of a space. Studies have demonstrated the significance of enhancing holistic performance evaluations in higher educational buildings on the improvement of the students' learning environment, with the study by Khalil et al. (2012) serving as a good example in this respect. Khalil focuses on the establishment of a new architectural rating tool for building performance to be used in the improvement of student learning in Malaysia's higher education facilities (Khalil et al., 2012).

The performance evaluation framework in the design or occupancy of a spatial environment reflects the dynamic aspects of the man-environment relationship, revealing a comprehensive perspective for the management of architectural practices. Forming a strong relationship between humans and their lived environment, an assessment of accessibility performance dimensions involves both *user* (the level of user satisfaction) and *spatial* (technical and qualitative qualities of the physical environment) aspects. With focus on the relationships between the characteristics of the physical setting and its users, each evaluation reveals a "focal problem" as a special concern related to the use of evaluated space (Friedmann et al., 1978, pp. 20-22). When addressing the specific focal characteristics of higher education campus cultures, the relationships between the aspects of the physical setting and its users should be addressed. This study considers the accessibility performance evaluation of public outdoor spaces on campuses to be a regional field of study that merits a separate evaluation in terms of this bilateral relationship.

When discussing outdoor campus spaces for SWDs, social interaction opportunities among all students can be increased through the implementation of architectural and

urban design principles that guarantee a user-friendly spatial environment and the maintenance of a healthy social life. This can contribute also to long-term social viability of community life on campus, meaning that an evaluation of access is also significant in efforts to address spatial equity issues, as mentioned in detail in Chapter 3. In this regard, the aim of a performance evaluation is not only to identify physical accessibility measures, but also to respond to the need for the equitable participation and social inclusion of SWDs in educational spaces. In short, the success of a PE for accessibility depends on the inclusion of all community members in public life, meaning that their reliability depends mostly on the experiences of disabled users in the public spatial environment. In short, the dimensions of a performance assessment of the spatial environment of a higher education institution should not be limited to environmental issues, but also towards functional and social aspects.

There are two important issues to be addressed when evaluating holistic disability experiences as part of spatial use: The ways in which the outdoor environment supports (1) each type of activity; and (2) user experiences in both the physical behavioral and social nature of those spaces. The inclusion of user data is strongly emphasized, particularly for the realization of this stage, and it has often been stated in literature (i.e. Staeger-Wilson et al., 2012) that this means of assessment can expand the body of relevant literature in a credible manner.

In Turkey, the first legislative measure was the July 2013 “Regulation for Monitoring and Controlling Accessibility”, which gave responsibilities to all stakeholders to monitor and control accessibility design. Through this statute, individual needs and complaints about the physical environment encourage the resolution of accessibility problems by giving responsible institutions a legal obligation. The assessment of the built environment is based on answering the main question, “Does the design comply with technical design standards prepared by the Turkish Standards Institute (TSE)” In this regard, how the design of the built environment is assessed in terms of enhancing the participation of all members of the community in a coherent and holistic manner

remains a questionable issue at a national level. Assessing the quality of the built environment on a campus in an ongoing process that facilitates the building of a control mechanism after seeing the overall picture related to the missing parts of design applications, rather than reacting to complaints about physical environment, is an important issue.

In the scope of this study, "How is the accessibility performance of the outdoor public campus environment assessed?" and "Which performance design criteria in the assessment can facilitate an understanding of the necessities for equitable access of SWDs?" emerge as the key questions to be answered. Performance evaluations are essential for understanding the current shortfalls of the physical setting at the present time and for making predictions of future performance. It will be defined in this thesis according to which criteria the environment will be evaluated to ensure equitable use and social inclusion of SWDs, aiming to generate information in this field.

4.3 Developing Holistic User-Centered Performance Evaluation and Design Parameters

Architects tend to apply strict technical design specifications to their designs in order to satisfy the needs of people in wheelchairs, although such technical sources prove to be somewhat limited when performance evaluations attempt to understand how the building or setting actually works for a range of users, as mentioned by Preiser (Preiser, 2002, p. 20). The importance of quantitative studies cannot be denied, although firstly there is a need to develop and operationalize a need-oriented set of performance evaluation and design parameters for the outdoor campus environment. Lynch's normative approach takes the view that is possible to create a "Good City" for all based on a set of design principles (Lynch, 1981), while this study asserts that it is essential to establish normative design guidelines that meet fully the requirements of SWDs in higher education built environments.

The establishment of a user-centered normative framework for campus planning contributes to the development of a reliable design and evaluation process for the local context (i.e. the particular country's legislative codes, standards and guidelines). It is suggested in this thesis that the reliability of these guidelines can be ensured through the use of qualitative data based on local conditions. In this regard, this study aims to develop holistic performance evaluation and design parameters by gaining access to the environmental perceptions of the "real" users in the analysis of the design of the outdoor campus environment.

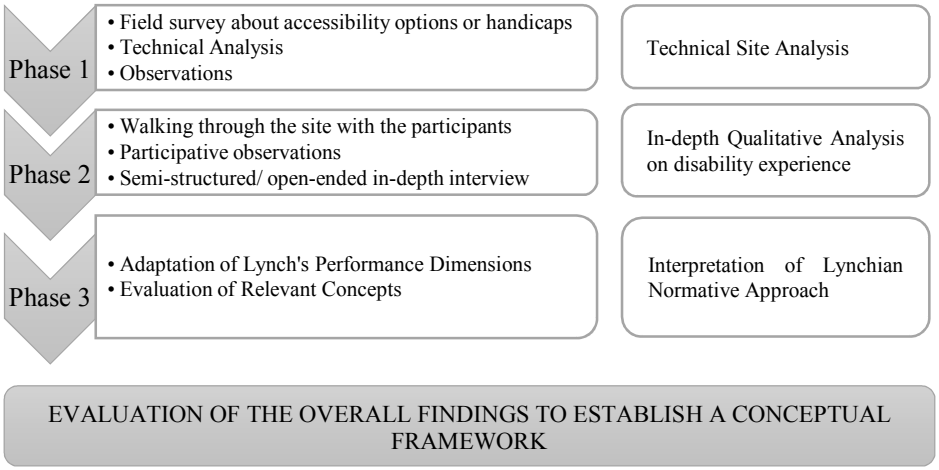
4.3.1 The procedure

Phase 1: Within the study, a technical performance evaluation design tool (Appendix A) was created for the quantitative analysis of the physical outdoor environment of the METU campus. The access-audit tool used for the technical accessibility analysis was integrated with the obligatory prescriptive national technical standards for campus built environments defined in Turkish legislation, taking into account the proposed campus life activities. Ideally, the themes of this technical analysis should comprise all activities engaged in by a student, from entering the campus to participating in the diverse types of campus life activities, whether educational, social or cultural, associated with a post-secondary education institute (Appendix A). The main intention is to create a truly inclusive educational environment in which not only the buildings, but also all indoor and outdoor common areas on a campus are designed in a holistic manner within the performance evaluation procedure. Adopting this vision, the scope of this study is limited to accessibility options or obstacles related to outdoor spaces. (Table 5)

Phase 2: To gain a comprehensive understanding of the extreme disability experience on campus, semi-structured, open-ended, face-to-face in-depth interviews were conducted while walking through the outdoor spatial environment of the campus. This disability experience comprehension process directly allowed participative

observations to be made, brining added value and richness to the data-gathering process. (Appendix A)

Table 5: Research Procedure to Develop Performance Evaluation and Design Parameters for Open Campus Spaces



Phase 3: In this stage, the Lynchian normative approach is explained with its proposed performance dimensions, opening the accessibility of the built environment of a campus to discussion.

The data gathering and evaluation processes in phase 1 and 2 are explained in detail in Chapter 5 of the thesis. In the following section, the performance evaluation approach of Kevin Lynch is explained and an appraisal is made of his proposed performance dimensions for a better public life in a city, with particular focus on accessibility for people with disabilities. Chapter 6 brings together all three phases to establish a conceptual framework for an inclusive outdoor campus environment for SWDs.

4.3.2 Kevin Lynch's Performance Evaluation Approach

For Lynch, a good settlement is an open one that is "*accessible, decentralized, diverse, adaptable, and tolerant to experiment",* by which it enhances the *continuity* of a culture and the *survival* of its people, increases *a sense of connection* in time and space, and permits or spurs *individual growth* (Lynch, 1981, pp. 116-117). Although his related book is entitled "Good City Form", he is concerned with both the formal structure of a city and the non-spatial values needed for the "goodness"[14] of any human settlement (Lynch, 1981, p. 235). He describes a good city form as having the following attributes:

> It is *vital* (sustenant, safe and consonant);
> It is *sensible* (identifiable, structured, congruent, transparent, legible, unfolding and significant);
> It is *well fitted* (a close match of form and behavior which is stable, manipulable and resilient);
> It is *accessible* (diverse, equitable and locally manageable); and
> It is *well controlled* (congruent, certain, responsible and intermittently loose). (Lynch, 1981, p. 235)

In his *Normative Theory of Good City Form* (1981), Lynch refers mainly to the formal qualities of the city by highlighting the above attributes as performance dimensions: *Vitality, Sense, Fit, Access and Control,* all of which can be achieved through internal *Efficiency* and *Justice* (Lynch, 1981, p. 235). He puts forward these five dimensions and two meta-criteria as the all-encompassing elements of spatial quality (Lynch, 1981, p. 114). Referring to these concepts, he states that:

> While efficiency deals with how costs and benefits for any one group are distributed among the several types of value, justice is the way in which benefits and costs of any one kind are distributed between persons (Lynch, 1981, p. 225).

[14] Lynch uses the term "goodness" to refer to livable built environments for all residents, including people with disabilities, in every aspect of city life.

With emphasis on providing a good fit between the life dynamics of people and the city form, Lynch searches for "universal" performance design guidelines to understand "How a good city is formed" and to answer the question of "What is a good city?", and proposes these five dimensions, supported by two meta-criteria, in an attempt at "universality". He illustrated this point in a lecture one year before "A Theory of Good City Form" was published:

> I am not going to speak about the ideal city … What I want to talk about is something deeper than that. It is this: what are the criteria for a good city? And therefore I will talk about performance. More exactly, I will talk about something I call a performance dimension; that is, not a strict rule, but some aspect of the city that you can describe and yet connects with our important values. By looking at any physical city, you can tell me, yes, it has more or less of this thing … I think these are the crucial values, the fundamental performances of any settlement. Once you have specified how much of these dimensions a city has, then you are able to say to what degree it is a good city. (Lynch, 1980, pp. 5, 7)

Lynch does not mean that performance dimensions are generalized across cultures or different groups in the population of a city in this regard, as can be understood from the following statement:

> … we must realize that it would be foolish to set performance *standards* for cities, if we mean to generalize ... Situations and values differ. What we might hope to generalize about are performance *dimensions*, that is, certain identifiable characteristics of the performance of cities which are due primarily to their spatial qualities and which are measurable scales, along which different groups will prefer to achieve different positions. It should then be possible to analyze any city form or proposal, and to indicate its location on the dimension, whether by a number or just by "more or less". To be general, the dimensions should be important qualities for most, if not all, persons and cultures. Ideally, the dimensions should also include all the qualities which any people value in a physical place. (Lynch, 1981, p. 111)

Herein, Lynch emphasizes that a generalization of performance dimensions across cultures is impossible, since the process of the creation of a good city form changes according to life options, cultures and interests of the people who are in residence.

Although he states that the situation differs from case-by-case, he highlights a need to establish a normative theory that can be adapted to any type of public settlement. In basing his theorization on the basis of two meta-criteria, *Efficiency* and *Justice,* he makes a more powerful and universal framework so as to create a city life that respects the rights of its all community members to the greatest extent possible. It is important for the position of this thesis that the structural condition of the built environment of a campus has the *competency* and *capacity* (efficiency) to meet the needs of every student, as it is essential for them to be able to access current post-secondary education opportunities in an *equal* and *balanced* (justice) manner. Founded on the Efficiency and Justice criteria, Lynch proposes five performance dimensions to cover the social and physical aspects of a good city form to analyze its sufficiencies. In this respect, his work can potentially be made applicable to many design-related contexts as a result of its underlying supportive assumptions.

Lynch's 1981 "A Theory of Good City Form" grasped at his 1961 study "The Pattern of the Metropolis" (1961). In the earlier study, Lynch addressed the reshaping of metropolises for the common good of the public and the highlighted the crucial aspects of the metropolitan pattern. He proposed commonly recognized alternative patterns and suggested new alternative patterns for metropolises, and stated the means of choosing the best one for any particular purpose. (Lynch, 1961, p. 79) He went on to add that there was a need to increase the knowledge of city form since the influences of the goals – related to choice, interaction, cost, comfort, participation, growth and adaptability, continuity and imageability – are not always obvious, and are often in conflict (Lynch, 1961, p. 94). In "A Theory of Good City Form", he sought to overcome these shortfalls by proposing *systemic, universal* and *open-to-standardized* dimensions that could be more flexibly adopted to any case. However, the questions, "Do the dimensions really response to the 'goodness' of a city?" and "Do they apply to varied cultures and in varied situations?" still remain to be addressed. It is necessary to elaborate on each dimension so as to expand its various sub-dimensions and to elucidate its possible associations to particular design-oriented values of public life. In

this sense, an evidence-based interpretation of the performance dimensions of a "Good City" may fill successfully the gaps in knowledge in a specific research field.

Lynch's "The Good City Form" (1981) is considered a masterpiece in the planning and design field, given its innovative and flexible approach to which attributes any human settlement should possess for a better and right way that is open to all human life. Nearly 30 years after its publication, the study remains relevant and innovative, and serves as an important reference for many architectural and planning studies, like many of Lynch's most cited valued studies (especially "The Image of the City" 1960). Lynch's study had a profound effect on the studies of many architectural and urban planning theorists, whose works have also been referenced extensively in academic literature. For instance, Francis (1989) "Control as a Dimension of Public-Space Quality" opened a discussion on relevance of Lynch's five dimensions of control-presence, use and action, appropriation, modification, and disposition to public space quality; while Jacobs and Appleyard's (1987) "Toward an Urban Design Manifesto" includes similar ideas to those of Lynch referring to the urban-related place utopia.[15] Furthermore, urbanists and architects in recent times have also paid heed to Lynch's ideas, with Belir and Önder (2013) referring to Lynch's arguments related to *legibility* in the context of wayfinding for people with visual impairments. As a final example, the study by Talen (2000), in which she makes a critical discussion of pedestrian access as one of the most important concepts in a good public life, refers to *sustainable development* and *new urbanism* while citing and taking the support of Lynch's normative theory:

> Kevin Lynch advanced the notion that urban research focuses entirely too much on explaining urban phenomena and alarmingly little effort is given to developing normative theories of settlement form. Urban planners must

[15] Jacobs states this is a very natural situation, in that "*Donald and Kevin went back a long time together. We all talked frequently, and we shared values and an approach to our work." (Jacobs & Appleyard, 1987, p. 112)*

> understand not only the functions and processes that create urban patterns, but also the direction in which urban form ought to be going. (Talen, 2000, p. 275)

I argue in this thesis that disability studies in the design field can also gain from Lynch's discussions of good city attributes, founded on a basis of "justice". It is interesting to re-read his performance dimensions from the perspective of the equitable access of people with disabilities, since a holistic performance evaluation allows more attention to be paid to the social dimensions. In this sense, this study aims to identify the basic performance parameters to be used in an analysis of the design of the built campus environment by evaluating these criteria with reference to the active and equal participation of SWDs in all campus activities. The developed parameters contribute to the development of a single participatory index for a physical campus setting for SWDs with regard to its physical usage on an equal basis. The performance evaluation parameters necessary for the design of a built campus environment that ensures equal access by SWDs are opened to discussion below, paying heed to each of Lynch's performance dimensions and their meta-criteria *Efficiency* and *Justice*.

Vitality

Lynch defines the first performance dimension, *vitality*, as follows:

> … the degree to which the form of the settlement supports the vital functions, the biological requirements and capabilities of human beings – above all, how it protects the survival of the species. (Lynch, 1981, p. 122)

Sustenance, Safety and *Consonance* are stated as sub-qualities of *vitality*. According to Lynch, *sustenance* refers to the fact that the physical system of the supply and disposal of goods should be adequate to sustain human life. To achieve this, attributes of the built environment, such as the location of settlements and the effect of buildings, should be adapted to produce the required supplies. (Lynch, 1981, p. 121) Secondly, *Safety* refers to a physically secure environment in which "hazards and diseases are

absent or controlled, and the fear of encountering them is low". (Lynch, 1981, p. 122) Finally, for *consonance,* Lynch highlights that the spatial environment should be consonant with the basic biological structure of the human being. (Lynch, 1981, p. 122) To sustain all life (e.g. the disabled, the young, the old, the poor, the ill, and the subjugated races, classes and genders), he emphasizes *equal access* to other people, areas, services and activities. (Lynch, 1981, p. 228) It can be noted here that enhancing *safe* and *equal access* to the various parts of the built environment is a prerequisites for sustaining and maintaining life for all community members, especially the parts of the population with impairments. As far as the spatial needs of people with disabilities are concerned, *Safe Access* merits particular attention in architectural design, as in some cases, this is a matter of life, and even survival, for them. Accordingly, the design guidelines of the UD and ID design philosophies both emphasize *Safety* in all circumstances (NCSU, 1997; CABE, 2006).

Sense

Sense, a second performance dimension proposed by Lynch, means:

> The degree to which the settlement can be clearly perceived and mentally differentiated and structured in time and space by its residents and the degree to which that mental structure connects with their values and concepts- the match between environment, our sensory and mental capabilities, and our cultural constructs. (Lynch, 1981, p. 131)

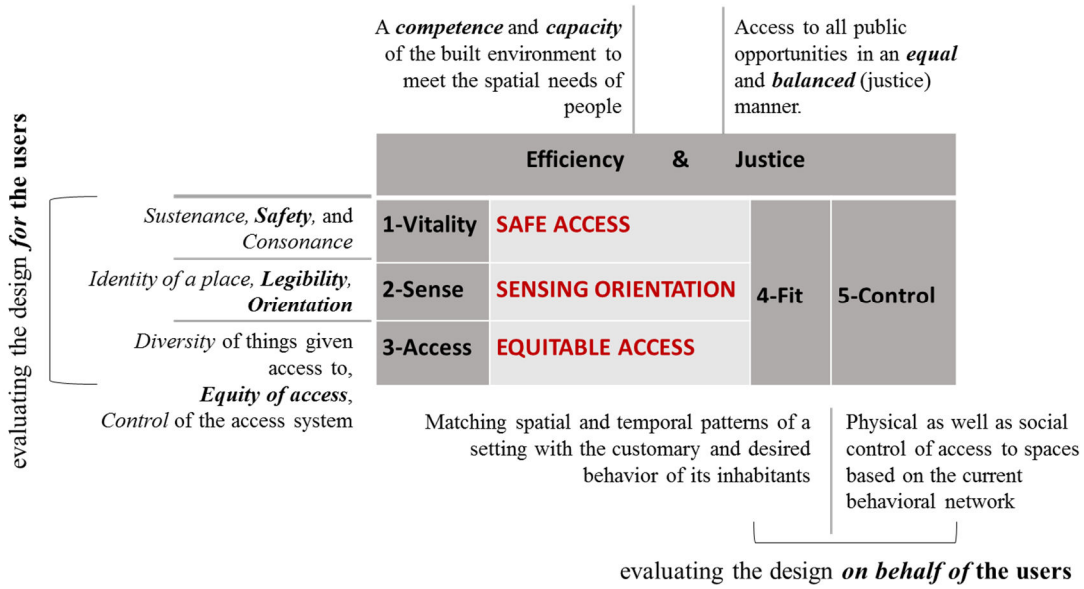
This definition refers mainly to the *identity of a place* in terms of its valued social, cultural, spatial and emotional aspects. It refers to the quality of a built environment that supports its users in recognizing and remembering it with ease. In the overall meaning of identity, a quality that provides identity occurs as a result of the relationship between the person and place (Lynch, 1980, p. 13).

Within a formal component of *sense*, Lynch also mentions *legibility* as an important non-spatial attribute in a settlement for accurate communication between the inhabitants and the spatial form through symbolic physical features (Lynch, 1981, p. 139). On this issue, he emphasizes "good orientation enhances access and good opportunity". (Lynch, 1981, p. 134)

The issue of legibility was addressed by Lynch also in 1960 in his most famous and value-laden book "The Image of the City", prior to "The Theory of Good City Form". Legibility, for Lynch, is a condition in which it is easy to comprehend, perceive and remember a space (Lynch, 1960). The strategic link between the environmental image, the mental picture of the exterior physical world that is held and perceived by an individual influences the process of wayfinding (Lynch, 1960, p. 4). In this manner, he considers landmarks to be a useful designed tool that can also be a unique and memorable asset for people with diverse disabilities. Lynch suggests that the more the physical setting is perceived through different senses by means of existing identifiable symbols, the more legible it is. Similarly, Passini (1984), in the book "Wayfinding in Architecture", utilizes the term "legibility" in relation to wayfinding and orientation, referring to it as an environmental quality that facilitates dramatically environmental communication by offering fundamental information.

In mentioning the issue of justice for all, but especially for people with diverse disabilities, Lynch places the themes of *orientation* and *legibility* into a prerequisite place to overcome the unequal access to other goods, including places (Lynch, 1981, p. 228). This reflects the focus of accessible design literature, to a large extent. In the context of accessibility in design literature, wayfinding has been used to refer to the user experience of orientation and the easy and independent, and thereby equal, perceiving of the environment. (NCSU, 1997; CABE, 2006)

*Table 6: Spatial sub-values of performance dimensions proposed for a "*Good City Form*" by Kevin Lynch (1981) which are relevant to the performance evaluation and design parameters for this thesis*



He explains that although it may appear to be the least tangible dimension, and thereby the hardest by which to measure the deep symbolic meaning of an environment, the way in which the city fits the mind can also be analyzed. (Lynch, 1980, p. 7) Whether a place has more or less of this quality can be analyzed by studying any specific place and its users together, and understanding the way in which they perceive it, the way they structure it, their feelings for it, and the way it fits into their sense of life and community (Lynch, 1980, pp. 20-21). Perceptible spatial information gained through different senses, as well as a legible configuration of the buildings and other parts of the built environment in the physical setting of a campus, provides easier and more secured access not just for students with disabilities, but for all. In judging the sense of a place from the perspective of people with disabilities, the landmarks, the shape of the ground, the position of the diverse built elements, and so on, facilitate the mapping of the structure of the place in the mind. These are crucial spatial orientation cues for people who can see well, while in the case of access for people with severe visual

impairments these contexts are still important, but their formal conditions can change according to the way they perceive it (Table 6). As such, *Sensing Orientation* merits evaluation within the context of this thesis.

Access

Access to the quality of any public space has long been a subject of discussion (e.g. Jacobs & Appleyard, 1987; Lynch, 1981; Francis, 1989; Heylighen et al., 2013; Mehta, 2014). Lynch dealt with "Access" as a basic component of his theory of city form (Lynch, 1981), defining it as:

> … the ability to reach other persons, activities, resources, services, information, or places, including the quantity and diversity of the elements which can be reached. (p. 187)

Access is one fundamental advantage of an urban settlement, and its reach and distribution are a basic index of settlement quality (Lynch, 1981, p. 203). The three important subdimensions of access are the *diversity* of the things given access to, the *equity* of access for different groups of the population and the *control* of the access system, as a primary means of enforcing social control (Lynch, 1981, p. 203).

The realization of Access principle relies on Lynch's perspectives of *efficiency* and *environmental justice,* with the former referring to the offering of a high level of access, thereby the greatest variety of *choice;* and the latter relating to equal access to existing and future life activities, which will in turn lead to an increase in *personal interaction* (Lynch, 1961, p. 92; Lynch, 1981, p. 229). From this standpoint, in addition to the physical aspects of *access*, Lynch deals also with social manners. In his normative views, it is important to note here that concern over the use of a particular setting by a particular segment of the population is significant. Given the continuing

tendency to design the built environment according to the needs of "normal"[16] people, the crucial issue of architectural access, and in turn, equal access for people with diverse disabilities, continues to be neglected. Celebrating diversity among individuals is a facilitating approach to the achievement of *equity of access* in the built environment, especially for people with disabilities. In this respect, the criterion *Equitable Access* takes a lead position among the relevant concepts in evaluations of the built environment design of campuses (Table 6).

Fit

The fourth dimension, *Fit,* refers to the match between the spatial and temporal patterns of a setting and the customary and desired behavior of its inhabitants, making a good settlement possible, as stated by Lynch (1981, p. 151; 1980, p. 6). The current and future adequacy of the Fit affects strongly the personal sense of competence – "*the ability to do something well, to be adequate or sufficient"* (Lynch, 1981, p. 151). The banner of equity has often been raised in man-environment studies since the 1970s, as explained in detail in Section 2.1.4. Being actual users of the physical environment, regardless of their (dis)abilities, certainly depends on the achievement of a match between spatial qualities and all patterns of behavior, by which they will have equal opportunities in the use of public facilities. Although the *Fit* context is universal, it may vary in line with cultural expectations, norms and the customary ways of doing things. (Lynch, 1981, p. 151) In this sense, there is a need for numerous national studies to clarify this issue, and this study aims to contribute to the filling of this gap.

[16] Here, the term "normal" is used to criticize the design of the physical environment according to the needs of "people with no disabilities".

Control

Lastly, *Control*, refers to "*the degree to which the use and access to spaces and activities, and their creation, repair, modification, and management are controlled by those who use, work, or reside in them*" (Lynch, 1981, p. 118). In this sense, the *congruence* between the typical spatial settings and the major communication systems in prototype cases serves as a significant tool for analyzing the dimension of place control (Lynch, 1981, p. 205). The second aspect of *control* is related to the relationship between control and justice, which Lynch describes as: "*The analysis of participation in spatial control by various social groups would be, like the mapping of equity of access, basic evidence in the analysis of justice*" (Lynch, 1981, p. 230). Direct support of this view, which sees control as an environmental justice concept, has been provided by Francis (1989), who utilized Lynch's five dimensions of control – *presence, use and action, appropriation, modification* and *disposition* – addressing their relevance to public-space quality, (1989, p. 148) Francis raised two important concepts related to this issue, being: *presence* (whether individual or collective); and (direct) *involvement,* in the design, build and management of environments, according to which human *connectedness* to and *participation* with a place can be facilitated (pp. 155- 158).

As demonstrated in Table 6, it can be stated from the overall discussions of the spatial needs of people with disabilities that *Safe Access, Sensing Orientation* and *Equitable Access* may be adopted as the three main performance design evaluation parameters in this study. "*Fit*" and "*Control*" maintain a reciprocal relationship within Lynch's approach, in that while the former one dwells on the equal usage of an existing behavior pattern in the city, the latter is related to the physical as well as social control of access to spaces, based on this current behavioral network (Table 6). Although these two criteria are affected by the design of the built environment, they can also be put forward as leading concepts in the regulation of the current and future behavioral systems. At this point, they can be considered important subjects in the management

of accessibility design measures, evaluating the environment *on behalf of* the users (Table 6). On the other side, *Safe Access, Sensing Orientation* and *Equitable Access* are guiding design criteria that tend to be utilized for the design or occupancy analyses of the environment *for* the users. In this regard, within the context of this study, they provide a particular design-oriented theoretical ground for an exploration of performance parameters to be used in the design evaluation of a spatial campus environment.

CHAPTER 5

FIELD RESEARCH: UNDERSTANDING SPATIAL EXPERIENCES OF STUDENTS WITH DISABILITIES THROUGH A CASE-BASED STUDY

"Ne kadar eşit imkân sunarsanız, o kadar eşit oluyorsunuz."
"The more equal opportunities you offer, the more equal you become."
The blind student

5.1 Aim of the Field Study

The field study is an exploratory research whose primary purpose is to provide a comprehensive understanding of the spatial experiences of post-secondary students in wheelchairs and those with severe visual impairments while accessing areas and buildings in the open spaces of the campus. The design of outside common areas in a campus setting has a crucial impact on independent access to diverse outdoor or indoor spaces where many post-secondary academic, social and leisure activities are hosted (Marcus & Wischemann, 1990, pp. 176-177). This field study aims to identify the spatial factors affecting the equal and independent access of SWDs to open spaces and buildings from their lived experiences in their post-secondary educational outdoor spatial environment. To this end, it reveals the spatial contexts that support or hinder *equitable access* to spaces, and consequently, *equal participation in activities*. Participation refers to the act of making an action – simply, if participation is possible, a person has the opportunity to become actively involved in an activity. In this manner, it supports the development of *social inclusiveness* in public life. In other words, the

stronger the interactive relationship between an “activity” and “participation”, the more vigorous the social and physical inclusion of individuals in the community. Founded on this argument, this field study aims also at understanding how the physical environment affects social inclusion in the campus community.

To this end, a qualitative research method was utilized in the study incorporating two means of investigation: open-ended/semi-structured interviews; and participative observations. The study was conducted in the Middle East Technical University (METU) Campus, Ankara, Turkey, and involved five students in wheelchairs and nine with severe visual impairments. These two groups of users were selected for the study as their experiences are based on extreme living scenarios (Cassim, 2013), allowing a demonstration of how the built environment can meet a wide range of spatial needs. The users that participated in this study have diverse (dis)abilities and utilize diverse types of assistive devices that allow them to move independently through the spatial setting. In this sense, their lived spatial experiences in relation to their spatial needs vary according to their level of ability in independent physical activities, their chances/options related to access upon arrival at the spaces in question, the duration of use/residence on the campus and their residential preferences. In addition to the spatial opportunities and insufficiencies experienced with the campus built environment, these variables affect the participation level of users in campus life. Aside from factors related to the physical setting, social factors, including personal characteristics, friend relationships and institutional support, are also considered as factors affecting participation in diverse activities on campus. This study attempts to explore all of these themes, aiming to identify the spatial factors that influence the access of the participants to spaces and buildings, and their ability, or lack thereof, to participate in activities in the campus built environment.

5.2 Descriptions of METU Campus

METU is a globally well-known and respected university. It embraces both national and international students, and so diversity in the form of a strong cultural mix is visible. In this respect, it is obliged to provide as part of its pluralistic cultural spirit an inclusive physical and social environment.

In Turkey, METU is considered a pioneering university in terms of the support provided to SWDs in the form of on-campus support services. It generally takes a facilitator role in the advancement of accessibility for SWDs for the other universities in Turkey. In 2004, long before the advent of a legal commitment in Turkish universities to provide disability support services, the METU Disability Support Office, known as the Inclusive Life Coordinatorship [ODTÜ Engelsiz Yaşam Koordinatörlüğü], was established under the coordination of Claire Özel, and was given the responsibility of investigating and addressing the existing structural and attitudinal barriers on campus, and advancing services for the inclusion of SWDs in campus life (Özel, 2013). Özel served as the coordinator of this Unit between 2003 and 2011 (Özel, 2013), during which time the unit contributed to the creation of the 'Regulation on Collaboration and Coordination of Higher Education Institutions for Persons with Disabilities'. In 2011, the 'METU Inclusive Life Coordinatorship' was restructured with the establishment of the METU Disability Support Office (Engelsiz ODTÜ Birimi), which was tasked with ensuring equal access to the spaces, resources and services of the university to people with special needs resulting from diverse disabilities, and with establishing an environment that supports their development (METU, n.d.).

In 2015, of the total population of 123 students with disabilities in METU, 23 had visual disabilities, while four were wheelchair users (Hatipoğlu Sümer, 2015). Since 1990, through the work of the Friendship and Solidarity Student Club, and since 2003

to the present day as a result of the works of the Inclusive METU Student Club, SWDs have worked together with able-bodied students to address the issue of equal education opportunities for all. Their activities have included, for example, group discussions about spatial needs, preferences and wishes; participating in events to advance awareness; and studies, activities and exhibitions (Özel, 2013).

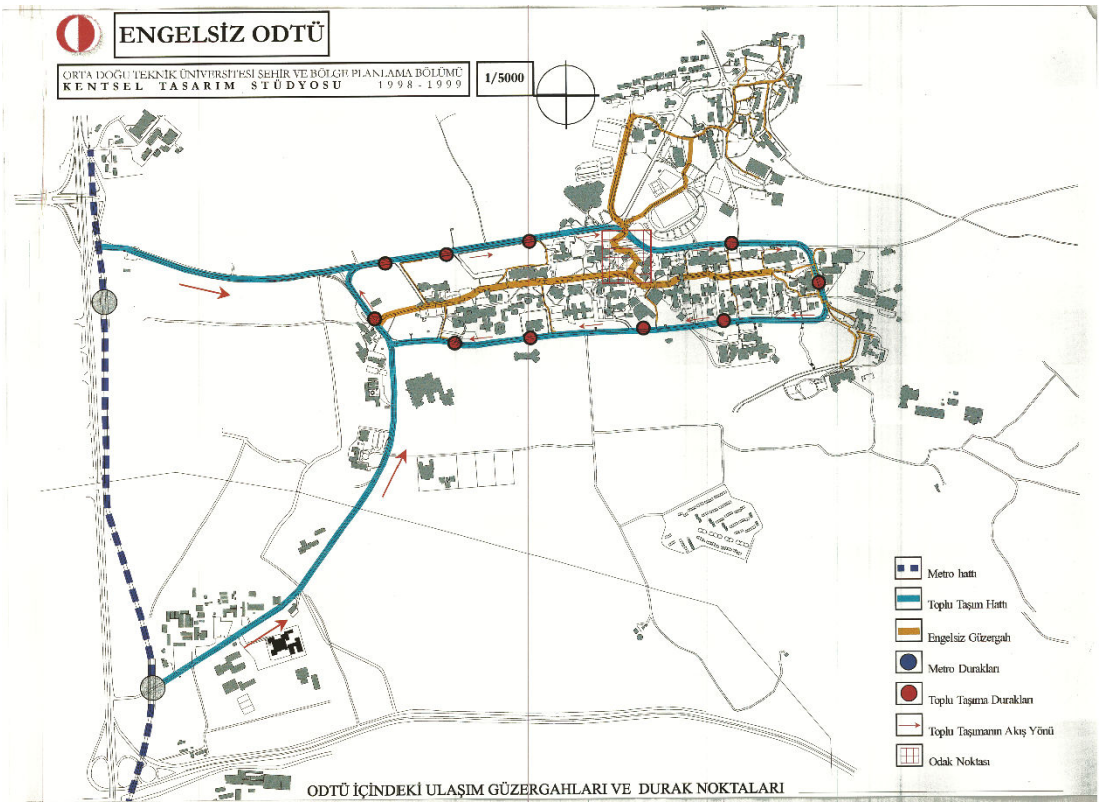


Figure 3: Inclusive METU Project, Urban Design Studio 98-99, City and Regional Planning Department, Faculty of Architecture, METU.

The first accessibility studies were launched in 1998 through the 'Inclusive METU (Engelsiz ODTÜ)' project (Figure 3), initiated as a component of the City and Regional Department Planning course, Urban Design Studio 1998-1999 by instructors

Architect Can Çinici, Architect Berrak Seren, Industrial Designer Assistant Prof. Dr. Çiğdem Erbuğ, City Planner Associated Prof. Dr. Baykan Günay, Mechanical Engineer Prof. Dr. Mehmet Çalışkan, and Dr. Adnan Barlas. The aim of the project was to improve campus outdoor spaces and circulation patterns, considering public transportation facilities, in an equal manner. Unfortunately, the project was never applied, and since then, accessibility problems have tried to be overcome through piecemeal efforts to address the immediate needs of SWDs.

The METU Campus, located in Ankara, Turkey, was designed by Behruz Çinici and Altuğ Çinici in 1961 after they took first position in a national competition. The campus outdoor spatial environment has important landmarks that are particular to the settlement. One of the most distinguishing architectural features of the campus is the central boulevard, the Alley, which symbolizes the public face of the campus. The Alley can be considered as a central pedestrian axis that connects building entrances, outdoor spaces and secondary access routes. It proposes a variety of opportunities for engagement in various campus outdoor activities, while providing also easy access to the buildings. Formal or informal gathering places for relaxation, meeting with friends, eating meals while sitting on the grass and near the pools, and exhibitions of student clubs are some of the more common uses of the spatial environment. In this sense, it can be considered the life-blood of campus life, contributing to the formation of a public culture on campus where students, as well as staff make use of the outdoor spaces in significant numbers, with increased intensity, especially at times when particular activities are organized. Having considerable knowledge of campus life by virtue of my 11-years of experience helped me to make a comprehensive interpretation of the accessibility issue when evaluating all opportunities related to campus life.

5.3 Field Study Method

This study utilizes a qualitative research method to achieve the research objectives, making a deep exploration of the meaningful interactions between the user and the environment. The qualitative research methodology will integrate different methodological approaches, including those that are most commonly used, being *in-depth interviews* (known also as semi-structured interviews) and *participative observation,* with the intention being to obtain an in-depth understanding of personal contexts within which the research phenomena are located (Davies, 2007, p. 190). A deep understanding of the 'real world' may be garnered from the knowledge obtained from personal experiences, since such perspectives allow us to become "in-formed" and enriched by the experience (Van Mannen, 1990, p. 62; Ritchie & Lewis, 2003, p. 34). In this thesis, the empirical knowledge gathered from SWDs provides a strong indication of the 'real' problems they face on campus, and will serve in the development of empirically and theoretically grounded performance design dimensions for an inclusive built environment on campus.

Interviews were conducted with 14 students with disabilities from August to November 2014. Of those interviewed, five used wheelchairs and the remaining nine had severe visual impairments. Data was gathered through individual interviews with each participant while traversing the METU campus, with the route dictated by each student to represent his/her most commonly used physical activity pattern on campus. The chosen routes included a wide range of activities, ranging from entering the campus to accessing the entrances to spaces and buildings, creating a one-day diary of campus and spatial use in different times of the education term. The length of the interviews varied between one and four hours.

During the mobile interview on campus, the participants were asked open-ended and semi-structured questions about their spatial experiences of the experienced spaces and

travel routes. The questions were posed mainly to understand their level of access to outdoor spaces and buildings hosting diverse activities, whether necessary or social. There was a further intention to understand the physical activity patterns in their one-day travel diaries and any spatial factors, whether positive or negative, that influence their physical participation in activities in an outdoor campus setting.

During each trip, the narration was recorded using a tape recorder, which was then transcribed into a Word document. The collected data was analyzed using the content analysis approach for each user group, being students in wheelchairs and students with visual impairments. Each trip was recorded using the software application Geotracker to help in the translation of data into Autocad for analysis and visual presentation. After the interviews, the author took photographs of all of the key points in the physical activity pattern of each user.

5.3.1 Survey Respondents

METU students and graduates in wheelchairs and those with total vision loss or severe visual impairment were selected as participants in the study (Table 7). The final participation list included 14 METU students, five of which use wheelchairs and nine of which have some form of visual impairment. The duration of campus use of the participants ranges from two months to 10 years. Of the total, nine of the participants (two wheelchair users and seven with visual impairments) live in the residential facilities of the campus, while the remaining participants live with their families off campus.

Table 7: Descriptions of participants

USERS	*USED ASSISTIVE TOOLS*	*ACCOMMODATION*	*EDUCATION PERIOD*
Individuals with mobility disabilities			
User A-1	Manually-propelled wheelchair	With her family, off campus	8 years, student
User A-2	Electric-powered wheelchair	On campus	5 years, graduated
User A-3	Electric-powered wheelchair	On campus, with assistance	3 years, student
User A-4	Electric-powered wheelchair	With her family, in the vicinity of the campus	9 years, graduated
User A-5	Manually-propelled wheelchair	With her family, off campus	8 years, student
Individuals with visual disabilities			
User B-1	White cane (95% vision loss)	On campus	3 years, student
User B-2	None (85% vision loss)	With her family, off campus	5 years, student
User B-3	White cane (blind)	On campus	6 years, student
User B-4	None (85% vision loss)	On campus	10 years, graduated
User B-5	White cane (blind)	On campus	5 years, graduated
User B-6	White cane (90-95% vision loss)	With her family, off campus	5 years, student
User B-7	None (60-90% vision loss)	On campus	7 years, student
User B-8	White cane (90-95% vision loss)	On campus	4 years, student
User B-9	White cane (95% vision loss)	On campus	2 months, student

Given the low number of students with disabilities studying at METU, especially those in wheelchairs, graduate students were also invited to participate in the study, with three of the five participants using wheelchairs, and two of the nine participants with severe visual impairment being graduates. It should be noted here that graduated

participants are still considered users of the campus environment, since they still come to the campus for leisure and social activities from time to time. The questions asked to the graduated participants were based on how they lived and experienced the spatial environment on campus during their period of education. The data obtained from the graduate students included aspects of both their previous and current spatial experiences of the campus, and served as a valuable source of information in understanding the influences of diverse design features on their spatial use.

The types of assistive tools used by the participants are presented in Table 7. While two participants with wheelchairs use manually-propelled wheelchairs (MP-W), the others use electric-powered wheelchairs (EP-W). In the case of the participants with visual impairments, the two participants who are totally blind and four with severe visual impairments (up to 90-95%[17] vision loss) use a white cane. The other three participants with 85% loss of vision do not use a white cane, but have substantial vision loss. Accordingly, their experiences deserve special attention given their need for independent, safe and easy access to spaces in the outdoor physical environment.

5.4 Findings and Discussions

The findings of the field study are resented in two main parts based on the lived spatial experiments of the two user groups, being students who use wheelchairs and those with severe sight loss. In each part, the findings comprise the themes derived from the *interviews* and *participative observations,* describing the participants' spatial experiences while participating in diverse activities on campus, and specifically the spatial factors promoting or limiting their equitable access to spaces. In this manner, the gathered data is categorized mainly in terms of their experienced physical

[17] The stated level of vision loss of the participants is based on their medical board report, which the paticipants provided during the interview.

activities, their *circulation, approach* and their *use* of the outdoor campus setting. These aspects are described with the help of the physical activity patterns of each user group in accessing facilities, services and activities in the outdoor environment of the METU campus, and throws light on the participants' physical behaviors involving spaces that are accessed independently by the participants. As to the issue of their physical behavior in the outdoor setting, activities are categorized into two parts: (1) educational activities, both compulsory and optional and (2) social and leisure activities, which may include meeting friends, relaxation through use of the open campus areas, etc. In the first category, the educational activities listed in the diary may comprise accessing one's academic department or other department buildings to attend class; accessing buildings in which a seminar is being organized; accessing administrative offices to address student affairs; and accessing food and beverage facilities. The second category may involve access to buildings and spaces to meet with friends, participating in voluntary organizations and student clubs, and accessing facilities to engage in other social, recreational, leisure or sporting activities.

The access of SWDs to spaces hosting diverse types of activities are also influenced by the contexts of their experiences, including *living accommodation, transportation options, personal choices, abilities and skills, assistance from family members, service providers or friends* as well as *the design of the campus outdoor environment* itself. Accordingly, these themes are also clarified by the participants when narrating their spatial experiences related to participation in diverse campus life activities.

5.4.1 Experiences of the User Group A: Students with wheelchairs

In this section of the study, the types of used spatial patterns experienced by the participants with wheelchairs while using the open spaces between buildings are explained and spatial factors influencing their equal access to the outdoor environment are disclosed. They are categorized according to three activity themes: *circulation, approach* and *use*.

It can be understood from the interview and observation process that the physical activity patterns (Figure 4) of the participants are dependent on seven primary factors: a) access opportunities at different times; b) (dis)abilities of the users c) campus planning; d) location of the department buildings of the users, e) accommodation opportunities, f) help of others, and g) time, which are explained here in terms of the three activity themes of circulation, approach and use in an analysis of spatial factors dictating the users' equitable participation in campus life.

5.4.1.1 Circulation in the outdoor campus environment

The independent users' choices of their mode of access to the buildings or spaces depend on personal situations as well as environmental aspects. The users' (dis)ability, and accordingly, their use of wheelchair type (electric or manually operated), the accommodation preferences/opportunities, and the accessibility of the individual parts of the campus built environment and the city related to public transport and the built environment itself, tend to have a multilateral impact on the choice of access mode to/within campus. As a common daily activity of the participants, the participants access their department buildings or other building in which lessons are held.

Of the five participants in the study, three who need assistance in carrying out certain daily life activities reside with their families off campus, and of these, one (User A-4) resides at a walkable distance from the campus, having moved there especially so that she could continue her education. This allows her independent access to/within the campus through her electric-powered wheelchair (EP-W):

> We lived in Etlik previously. While living there, you need to return home once your course ends, so there is no time to engage in any activities in this huge campus. Then, we moved to Çiğdem, which has given me more freedom. After that, I had my own social environment. I have never thought about it until now, but it is directly related to the physical conditions, because I began to develop social relationships only after moving here at the end of the first grade. (User A-4)

The remaining two participants in this group (User A-1 and A-5) come to the campus setting in their own private car, and their first access points are the parking areas of their department buildings. They use manually-propelled wheelchairs (MP-W) that can be carried easily by the car. The main reason they prefer MP-W to EP-W to come to the campus is because of the lack of accessibility of public transport in the city. In a sense, they view this situation as an advantage, in that they can access many more spaces/buildings when using an MP-W with assistance. That said, when it comes to independent access, these two users cannot independently walk around the outdoor campus setting, since using an MP-W is not easy. It should be noted here that wheelchair type is viewed as an important factor affecting independent physical behavior in the campus area. These two users' viewpoints are as follows:

> I don't have an electric-powered wheelchair because we have a small car, and it is not possible to carry it. It is so heavy that it isn't practical to move… The physical environment was not very favorable; as you know, we need to walk up so many stairs at METU. It is obviously the same when moving around in Ankara. While using a manual wheelchair, with somebody's help I can access places that I wouldn't with a powered one. Going up or down is easier … If it is possible to make everywhere accessible, I would go anywhere with an electric-powered wheelchair, of course. (User A-1)

> They [electric-powered wheelchairs] cannot be carried in a car. … If you have a van, it would be possible… Flat terrain is essential to use an electric-powered wheelchair … During my undergraduate and graduate years, my mother took me to school in our car [for 8 years]. Since my house was far away from the school she was unable to leave me there and return home… If I hadn't had a car, I would have dropped out of school. (User A-5)

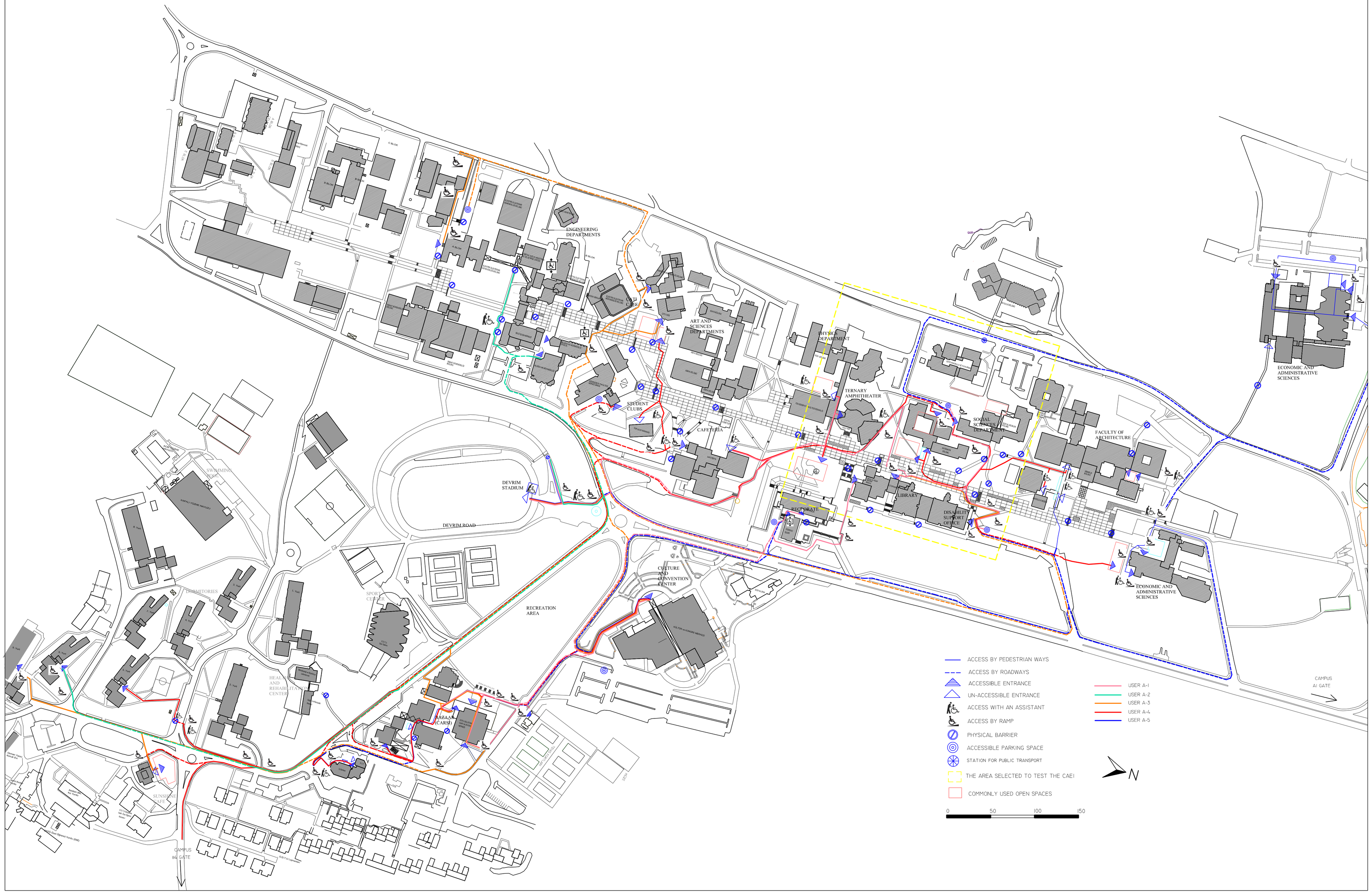


Figure 4: A map of physical activity patterns of the participants with wheelchairs

The inaccessible outdoor campus environment forces the two participants who use MP-Ws to travel with others, which makes them less eager to travel within the campus environment, as can be understood from the following statements:

> The feeling that you always need to be with someone is so bad! It is nice to hang out with my friends, but I cannot go out for a walk by myself when get annoyed. I don't have the opportunity to go around while listening to music, wearing my headphones. When the class is over, you have to stay there. When people are going, they ask, 'Will you come?' But, I can't. You know there is no other option. (User A-5)
>
> Being able to do something on one's own develops confidence so much. After the first year (in the university), I had the accident, my father or my mother were pushing me using handles on the back of the chair. Always being together with someone is like…! You know you always think about that person, since he/she has his/her own social life. It is not something that makes you happy. You don't want to keep someone always beside you. (User A-3)

Of the five participants, two live in a dormitory, one of which lives with a family member on the campus during the week, and with his family off campus at the weekend (Figure 4). For these participants, living on the campus gives them easy and rapid access to spaces. User A-3, whose family lives in Ankara, says: "*I need to arrive early in the morning when there is an exam, and living in the dormitory means I am much more likely to be able to get their on time*" (User A-3). One of the two participants who live in the dormitories is paraplegic (User A-2) and uses an EP-W to travel independently around the outdoor campus environment. Although he faces difficulties in accessing some spaces for mandatory or elective academic or social activities, he can make the journey from his dormitory to his department building independently. The participant who lives in a dormitory with a family member (User A-3) can also access some outdoor spaces and buildings using his electric wheelchair, but faces greater difficulties than the other dormitory resident due to the design of the physical environment, since he is paralyzed from the shoulders down. In his case, the shortest and most usable route between his dormitory and department building is nearly 1 kilometer, and features high sloped sidewalks and pathways and some slight

level changes. For this reason, he generally utilizes an accessible vehicle that is provided as a service for students with diverse disabilities by the institution since 2013. Its timetable is mostly dictated by the pre-scheduled courses and exam programs of the students, and is scheduled generally according to the exact time between the dormitory and department or the home and department (if the home is in the vicinity of the campus), and vice versa. This support service provides easy and rapid access for the users in the campus built environment, especially in rain or snow; however, as User A-3 states, if easy access was provided in the physical setting, he would prefer to "walk" around the campus:

> He [bus driver] takes our course schedules. When I have a course, he takes me there and brings me back. We give him a separate schedule for exams, and they also abide by it. However, it is not possible to make a spontaneous decisions… So I stick to that schedule … If you ask, I'd rather take a bus or get on the subway if it [physical environment] was free of problems. (User A-3)

To accommodate those SWDs who make use of private transportation vehicles, it is essential to enhance the shortest accessible access route to buildings from a parking area to ensure their timely arrival for lessons or examinations, especially during snowy and frosty weather. For four of the five participants, this situation has been resolved at an optimal level, while the other explains the problems he has faced as follows:

> I have asked for a ramp next to the stairs closest to my department as this will allow me to go there directly without using that [long] road. They took measurements for it; and so I will be able to go there directly from the parking lot. When it gets cold or snows in the winter, I cannot use that route. For example, once I came there, I returned to my dorm after seeing the snow! (User A-3)

5.4.1.1.1 Spatial factors

Level differences

The METU campus has a major pedestrian backbone that links diverse types of buildings and the outdoor spaces between buildings through a linear pedestrian walkway, namely the "Alley". The design of the Alley includes intermittent access to it from parking areas along its length, as a prolongation of the roadways that run parallel to it along its two sides. This continuous pedestrian axis provides users with *timely, safe* and *easy access* between buildings and the outdoor spaces settled along its length. For SWDs, its usage is different from general use. Although not valid for the entire length of its route, the Alley generally does not provide full continuous access to those with physical handicaps. For this reason, all five users participating in the study claimed that they were forced to utilize the extended areas of the roadways to access many of the spaces along the Alley, bringing considerably losses in both '*time'* and '*effort'*.

Figure 5: A curb ramp with an appropriate sloped and surface quality

Figure 6: Discontinuity of the curb ramp on the most commonly used pedestrian crosswalk

In this means of physical approach to the Alley, the participants commonly use the roadway rather than the sidewalk due to insufficiencies the design measures of the sidewalks related to accessibility, which certainly results in unsecure travel. The sidewalks offer potential use at some points (Figure 5), but the lack of continuity in the design measures necessitates occasional walking on the roadway (Figure 6). These experienced shortcomings of the sidewalks include a lack of continuity in the drop curbs, as well as inadequacies in the design specifications (slope, surface covering and width of the ramp), the locations of curb ramps, insufficient passing space due to such environmental elements as trees, utility poles and dustbins, and finally, the surface covering. All of the participants know well the offerings of the campus related to equitable access by virtue of their previous spatial experiences, and so they know which sidewalks are accessible. User A-2 clarifies this situation, "*I often use this sidewalk because I know there is a drop curb at the end*". In earlier uses of the environment they chose to walk on the sidewalks, but had to double back on themselves due to the fact that there was no curb ramp at the end of their route. A number of the participants had something to say on this issue:

> I usually use the roadway. At first, I was using the sidewalk, but there were no ramps to ride down, and there are trees, so I can't pass from the left or right... In this case, I have to go all the way back so travelling on the sidewalk is very bothersome… With my electric-powered wheelchair, I can go many places using the roadway… Sometimes I face the risk of being hit by a car. (User A-3)

> I never use that central road [Alley] – which is used by all the students – as it has stairs. I always go along the main street. If I were able to use that route, it would be easier for me as it is shorter. (User A-5)

> I am uncomfortable with sloping sidewalks. Or if there is a tree in the middle of the sidewalk, you cannot pass from the inner side, and you are stuck, while the other side gives you the sense that you are falling. Of course, I don't imply that they need to cut down the trees, but they could expand the sidewalk. (User A-1)

> The sidewalks are dangerous… There may be a curb ramp on this side, but the question is whether there is another one on the other side. In the past I had used

> the sidewalk, but when I realized that there is no curb ramp, I became confused. I had to go all the way back. (User A-2)
>
> No problem arises as long as you go down the street! I'd rather use the road than the sidewalk. I don't trust the sidewalk, as it sometimes causes me to slip. I do not feel safe. Ramps [curb ramps] seem to be made for no reason … So you are forced [to use the roadway]! There is no other alternative! You belong to neither the road nor the sidewalk, and you find yourself asking: 'Am I a pedestrian or a vehicle?' (User A-4)

The excessive height of pavement results in an inappropriate slope of the curb ramp, which affects pedestrian access via the pavement. One of the graduate students, User 4, explains her spatial experiences, highlighting the past and current conditions:

> We used to go to those areas [from the sidewalk to the pedestrian paths], but I cannot do that anymore since the new sidewalk was constructed. There were downhill paths from the other sides, but they have not been in use since the day the sidewalk was raised! Previously, there were no paving slabs. The old sidewalks were made of concrete so that there was no problem in terms of height... The higher the sidewalk, the higher the level of ramp… All have gone out of use because of the new sidewalk. (User A-4)

Figure 7: The Alley, showing typical ground features

Figure 8: The continuity in circulation is severed by minor level differences

The participants, after arriving at the Alley from various directions by the roadways, move independently through the Alley, although it is not easy due to the uneven surface (Figure 7). Here, the first and foremost problem related to access is the level differences (Figure 7, Figure 8) with the exception of some physical parts (Figure 9, and Figure 10), as mentioned by the participant: "There are lots of stairs, I mean, it's not that flat. While going there, there are a few steps. You know it's the Alley … You need to use the dirt road beside the Alley to pass the stairs." (User A-3).

Figure 9: An inclusive design solution that links a path to the level of the Alley

Figure 10: The evenness of the ground level of the paved pedestrian routes at the junction enhances its use also by wheelchair users

Surface of the ground

The surface of the ground, although generally not as detrimental to the usage of open spaces as the level differences, is important for easy, comfortable and non-tiring access. At some points where the surface is so rough, as shown in Figure 11, the surface results in substantial physical tiredness and disturbance. In some areas, they can find smooth surfaces with appropriate technical measures to move easily and comfortably (Figure 12). This leads the participants to find other means of approach to their destination that are generally longer. This is valid also for the usage of sidewalks.

Rather than traversing an uneven sidewalk surface, they prefer to use the roadway for access.

> After I went on them [the cobblestones used to pave the Alley] for a long time my feet would be tingling, and I would begin to itch or something. (User A-1)
> The cobblestone pavement causes some trouble; I mean you would feel like *zizzzz*. The problem is that once you enter it, and most people with paralysis know this, you feel spontaneous contractions in your legs – sudden reactions that are beyond your control. As a result, [the cobblestones] cause balance problems. (User A-3)
>
> Propelling a wheelchair along the Alley is troublesome. It may be tolerated, although it slows you down and makes you exhausted ... It [the sidewalk] is not very comfortable. I don't use this sidewalk because it is also exhausting to use due to all the ups and downs. [I use] the road if I have no time to lose in getting to a course. (User A-4)

Figure 11: Paved surface of the pedestrian Alley

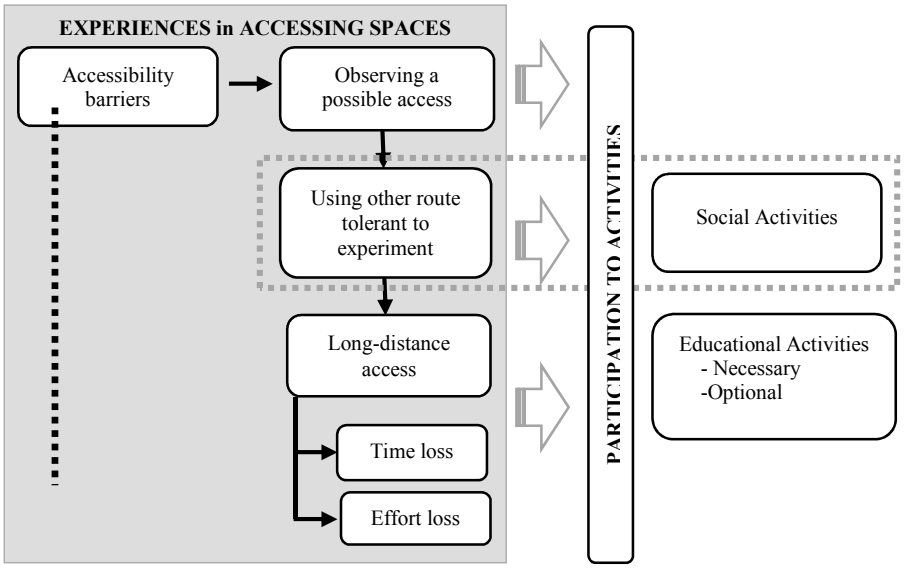
Figure 12: Smooth surfaces can contribute to ease of access for ALL user groups

Inappropriate ground surfaces may cause accidents, aside from impeding access and increasing physical inconvenience, as explained by one of the participants:

> My front wheel broke while trying to get to my exam. I got out of the car in front of our canteen and was running to the elevator. I was outside. Suddenly,

the part holding the front wheel broke! I didn't fall on the ground, but I was thrown forward as a result of the slight gaps on the path. At that moment, I wasn't able to move! I couldn't take the exam, of course. (User A-5)

Table 8: The interrelation of the contexts affecting user participation in activities close to their department buildings



The disintegration of their physical activity pattern from the commonly used spaces, as well as lackluster design measures result in the orientation of users towards longer routes, forcing them to observe the environment to identify tolerable access points. They need to take the time to "discover" possible access routes, whether they are goal-oriented or not, in the near surroundings due to a lack of information on how to access a particular space. This leads to time loss and physical effort, involving long range and uneasy walking at the first usage of route to a particular destination. For two participants who use MP-W, this process was experienced with the assistance of family members or friends. They know very well all of the access routes in the near vicinity. They clarify their opinions about the usage of the near vicinities of their department buildings as follows:

> I didn't know about the campus [when I first started school]. I even thought about leaving school … the physical environment was very problematic. Moreover, our department courses aren't given in one building, and so sometimes I had to go to the Department of Economics, and sometimes to the faculty of Architecture. I swear I said once that 'I cannot do that anymore!'; and to top it all I didn't have an electric-powered wheelchair. I couldn't use it by myself so I didn't have the chance to explore the campus. To be honest, I thought about dropping out the school at that time. Then we moved to Çiğdem and I bought an electric-powered wheelchair, and I started to explore. That exploration process was a result of my individual effort. Furthermore, there was nobody other than me using a wheelchair whom I could ask, 'How could you get there?' It was such an annoyance. (User A-4)

> We would go anywhere on the same footing if there was a smoother ramp or if it was designed in a more accessible way. We have to use a longer route to find more accessible ways ... I think making small changes is meaningless unless it allows the use of major places. (User A-1)

5.4.1.2 Approaches to outdoor spaces and buildings

Participants need help to access some places due to obstacles in the built environment that do not take into account their spatial needs. Inappropriate slopes of ramps (Figure 13 and 14), lifts not responding to the diverse needs of users, or out-of-order lifts are the most notable examples of this. In such situations they need to find another route to reach a space/building, or wait for someone to help them. Through the circulation way on the Alley, at the points where no access exists, they must use the soft landscaping to the side, whether grassed or not. Soft landscaping, as long as it is dry, appropriate sloped and smooth, can be a crucial means of access to some spaces and buildings along the Alley.

> I usually had to use the dirt road and the Alley in order to enter the building. A few years ago I went to the Department of Physics (Figure 13). I was using the road behind the department … I was going by vehicle up to a point, and then I was using the dirt road and, if necessary, trying to take a straight road. (User A-3)

> The only problem facing us everywhere is: Stairs! Steps! ... On campus [along the Alley] there is grass along the side of each staircase. My only annoyance is

that I sometimes was unable to propel myself on the grass. It turned into a muddy field in the rain and I couldn't get there at all when it snowed in winter. I had someone push me back then. Sometimes I asked people, 'Could you please help me?' or I would ask my friends for help, since we were hanging out together. You know the basic principle is to go as far as you can without using the sidewalk, but rather the grass and the dirt path. (User A-2)

Figure 13: An inclusive approach towards the Physics Building from the Alley

Figure 14: A steep ramp not linked with an accessible route results in its disuse

One important issue that should be noted is the additional obstacles resulting from non-spatial factors, such as parked cars in front of ramps, resulting in a sharply blocked access.

5.4.1.3 Spatial use in the near vicinity of the department building, considering daily life behaviors

In the general daily behavior pattern of the users, they spend most of their time participating in lessons in buildings, especially in the building of their department, and engaged in leisure activities in the open and indoor spaces close to their department buildings. Accordingly, it is essential to enlighten the spatial use of each user in the vicinity of the nearby department building, with the aim being to describe their access

experiences during the day, both between and after classes, based on the surrounding accessibility arrangements and the effects on the physical and social participation of the participants. This mode of physical usage, influenced mainly by the physical environment, has a distinct impact on the level of participation of SWDs in activities, which can be categorized under two headings, according to their statements: (1) educational activities necessary & optional, and (2) social activities.

Participation to educational activities

The required educational activities for the successful continuation of their academic education requires them to access buildings – their own department buildings and other buildings in which classes are given. In the event of having to attend a class in another building, its location should be at the closest accessible point. Participants can independently access their department buildings or many other department buildings for lessons, although it is not very easy for them when compared to their counterparts with no disability due to deficiencies in the physical setting. The length of the route required to access other departments to attend a class, and the uneasy access on account of the physical condition of the outdoor setting results in losses of time and physical exhaustion. It is apparent from the stated experiences of the participants that design measures are presented in such a manner that they would not be deprived from taking part in scheduled educational activities. The following issues raised by the participants deserve particular attention:

> I haven't taken a course there [at a different block in his department]. It would be too difficult. There is a device [a lift on the stairs] at the rear where the canteen of block D is. It was made later, but it is not very convenient to use. I've used it few times with the help of people. I mean, it's not something useful. I haven't taken any courses there, but I may have laboratory courses there next year. We will try to make an arrangement in some way. (User A-3)

Apart from scheduled events, such lessons or exams, the participants also spoke about attending optional elective courses and student affairs meetings, and participating in

desired academic activities. As displayed in Figure 4, for User A-1 and User A-4, it is possible to gain easy access to many buildings via the outdoor spatial environment, since access opportunities are enhanced along the shortest route to the point that access for those in wheelchairs matches almost general physical usage:

> Going from my department [Human Sciences] to the library is so easy and accessible since it is just a short distance from the department. If we use the route behind our parking lot going to the department of Physics, we find grass all around the Physics department, which is very accessible. Other than that, there isn't another way for me. (User A-1)
>
> There is no problem for the access to the Faculty of Mathematics, Physics and their canteens, and Triple Auditorium. I can go to the Library easily. The Alley causes a little trouble; it may be tolerated, though it slows you down and exhausts you. Aside from those places, I need help wherever I go. (User A-4)

For User A-5, this situation is quite the opposite:

> In my department, any language course can be counted as an elective course, but I could take no language course because I couldn't get to the Faculty of Languages and get up the stairs. The building was across from my department. If I had talked with the authorities, they would have helped me, but I didn't find it necessary to push the limits. Everybody had the opportunity to learn a second or third language, but I didn't. I chose my courses from among those given within my department building ... When living in a wheelchair, you learn to plan your life. You cannot say, 'I will find a way to get there.' I have to know in advance all the details, such as the course hours and the places I need to go. Whenever I had a course in another building, I went there beforehand to see whether I was able to enter the building. If I couldn't, I had to exchange correspondence. In such cases, I had two options. Either ask for exemption from the course or request a change in the location. I deal with the same thing every time since I need to know where and how I can go, as it would be foolhardy to work any other way. However, I'm not like that. I get worried very easily, and so I am trying to live so as not to upset anyone. (User A-5)

Under these circumstances, attempts are made to overcome physical barriers through the deliberate and careful planning of lessons and exams by each student, although this case-based response does not enhance the options for students with wheelchairs to participate in diverse post-secondary educational activities.

Participation in social & leisure activities

To engage in spontaneous activities with their friends is a challenge, due largely to the shortcomings in the open campus spaces. At such times, such questions arise: "*How can I independently access to that space? Is there an accessible entrance there?*" If there is a time limit to an activity during a course break, it is also important to assess the time of access. Moreover, for one participant who uses a special shuttle provided by the institution, "*If there is no accessible route to that space, does the shuttle's program fit my activity time?"* (User A-3). All of these challenges related to missing elements of the built environment prevent them from participating in activities, resulting in a decrease in social interactions with their friends. From their experiences, it can be understood that a bilateral relationship exists between the forming of relationships and access to commonly used physical spaces, especially those close to the users' department buildings. It would promote friendship and involvement in a social environment, as implied by User A-3:

> You know, for example, I cannot hang out with my friends a lot because I always ask myself, 'How can I get there?' If the answer is 'by a shuttle vehicle', then bye-bye! I have got around by the shuttle vehicle! You know students generally decide together where they will go when the course ends, but there not such a mechanism for me. I have to be a little more disciplined. It is something like 'I must be there at that time'… It is getting a little hard for me to be with my friends, to hang out. I guess I'm not capable of doing this ... Initially, these spatial barriers prevent you from doing that, and then you accept the reality. It's like going into your shell. You manage to find your own style, but that style involves little socializing. You know, it's just about taking care or catching up with something. In fact, that was the case for me. (User A-3)

Making a specific point about the issue, three of the five users who have faced difficulties in accessing the indoor or outdoor canteen within their department buildings stated its significance in becoming acquainted with the other students in the same department or faculty:

> I had many problems in the first year. For example, I could not go to many places. Let's say that my friends planned to go to eat soup at the Faculty of Architecture, but I couldn't! Why? Because there was no route there, so we had no chance to pass from the Preparatory School to the Faculty of Architecture. Often it would be: 'You go, I'm gonna wait here'. I didn't have many friends during the prep class because of these physical access problems. I was so unhappy. I couldn't interact with my friends. We would sit in the class at break time… I am a social person. If I weren't, I would turn in on myself. Of course such obstacles affect your life. In the prep class, I was badly affected. It's something which lowers your sense of belonging. (User A-4)

> Our canteen (in the Faculty of Humanities) is not accessible from either inside or outside. That's why I couldn't chat with my friends in the canteen so much during my undergraduate years. It certainly is something that affects my life, as it makes it difficult for me to socialize, not just with my friends in the department, but with friends in other departments. That's because the canteen is the only place where I can see those friends. You know my friends didn't make a fuss about it, so we became friends. (User A-1)

A circulation route that is incompatible with the general pedestrian physical pattern, coupled with uneasy access in the outside environment, puts an effective block on spontaneous actions with their friends. Also, the fact that the spatial needs that are essential for their independent access are ignored make them very unsatisfied. User A-3 explains this situation as follows: "*I feel like that! 'So I will also come, but let's use those roads to go there.' Although they do not say 'no', I must draw up a plan for them*".

The more circulation routes fit into a general used pattern, the more satisfied the participants are, since they can gain access on their own or with their friends, collectively taking the shortest possible route to that space. In this sense, reaching a place in the same way as a collective mode of friends also deserves substantial attention. The below statements of the users clarify this matter:

> You know I am not able to go alone, so somebody must be with me. When we are a group of people, we suggest, 'Go ahead if you wish; we will go there by climbing up that slope (describing the path next to the Triple Auditorium).' We offer an optional approach in this way. It is annoying. This is a bit steep, but it

is still one of the slopes that we would be thankful of finding at METU. (User A-1)

It makes you think, 'Ok, the department is accessible [from the parking lot], you can enter the building, and the condition in the department is so nice!' However, when you begin to wander outside, problems arise. Outside, I always need to be with someone … We generally travel as a group, since I was lucky, but it may not have been like this. We used to go by the same routes… Among them were 3-5 strong men who could lift me up easily, but there was no need. There are lots of areas that can be made here, you know, that's why I mentioned the ramp. We can walk together, so why would we use the elevator? Because it slows the travel. (User A-4)

5.4.1.4 Spatial use in different times of education period in consideration of participation to campus public life

To sustain and maintain an equal way of living on campus, equitable participation in both academic and social events is essential. The ability to participate in optional activities is based largely on an individual's choices, personal preferences and character, as a deficit in any of these can have an adverse effect on social engagement and one's active contribution to the campus community. This section of the study presents the participants' spatial experiences of how the physical campus environment affects their physical and social involvement in campus life in general.

The participants are fully aware of all the access opportunities in the near vicinities of their department buildings; although for the general use of the campus facilities, a lack of knowledge of physical access opportunities has the potential to result in a loss of motivation among the users to use such spaces. Gaining an awareness of the access opportunities on campus can take a long time. When they want to participate in an academic, social or leisure activities for the first time, they must first learn whether or not they can access the location. This can take significant time and much physical effort. In the case of optional or social activities, the participants may hesitate to somewhere if they lack knowledge of potential access opportunities:

> You know these student societies usually plan to meet once a week at a place in the late afternoon, so I need to make arrangements for such a plan. For example, they may gather and organize an event or something at a time when everybody has free time between 5:30 and 7:30 p.m., but I need to arrange a shuttle service. The location is supposed to be appropriate, but I have to plan and arrange these things in advance. It's not impossible, but it involves a little work. The shuttle service hours are usually within the working hours. When I stay at the dorm, I would actually go if it's not too cold … I have never gone to the cafeteria. I do not know whether it is accessible or not. It's troublesome for me to go there or enter the building. Can I enter there? I mean if I go to the main door using the roadway, is it possible? Is it a straight route, without any steps … I have never gone to the pool, for example. I do not know how I could get there by myself. Furthermore, I do not know if the swimming instructors would help me or not if I write a petition. I cannot go there as I am afraid and alone, but swimming is the best sport for my muscles. (User A-3)

It is true for all the participants that the more the travel range of the users increases, the larger their behavioral patterns are. This bilateral relationship is explained in their statements, supported by their visual perception of many spaces with access potential while travelling around new areas. It is important for them to access commonly used outdoor spaces, as this allows the participants to easily and rapidly recognize and learn about the near vicinity, and in time, the entire spatial campus environment. What is important here is to enhance perceptible information related to the local accessibility arrangements. This learning process encourages and facilitates the participation of the users when they need access at other times:

> I actually know where I can reach – the Bazaar, Sunshine [Café] ... Sometimes I go somewhere that I do not know and try to enter it from the gate. Then I say, 'Yes, I can enter here,' or 'I guess I cannot enter here.' If I cannot enter there, I give up, but if I can, I try. However, it remains in my mind, and then I can enter it next time. (User A-3)

> It is more likely that we began to explore here after beginning a German course in the third grade. We might have said, 'What's around here? Places like Çatı [Café], then let's go there' since I didn't have the chance to explore alone ... Although Çatı Café is a place where everyone goes, I had never been there up to that time because of access problems! (User A-4)

> I always tried to move around the campus using my own efforts. It is more personal in my case, as I have given many requests regarding the exam

> locations to say 'There is no entrance; please make a ramp here.' It is step-by-step for me! Whenever I realize that I am unable to enter a building, I say, 'I cannot enter here, please do something.' I would not come to realize it if I had never gone there. I go to those places only when it is required. (User A-5)

The access to the locations of optional post-secondary educational or social activities can be challenging as a result of the existing *spatial handicaps*. These spatial handicaps have a pronounced effect on the participants' behavioral patterns on campus, being mostly separated from the most commonly used circulation routes. Below are some of the answers to the question posed to all participants during interviewing "Have you experienced any difficulty in participating in an academic, social or leisure activity as a result of existing spatial barriers on the campus?":

> For example, I couldn't participate in the Psychology Students' Association. Because there are prefabricated buildings, as you know … with stairs leading up to them ... I went there not once, but several times, but it seemed to me to be so inaccessible ... Sure, it has an impact on participation. (User A-1)

> How do people go to the Library? It's just a short walk or a few steps from the Cafeteria, but what about me? I have to go there from the back road, you know, where the parking lot of the Library is… When I push the limits, I participated in everything. When required, I was carried by my friends on their shoulders. I got in their cars, or climbed a tree. I also climbed the tribune. I placed great demands on it. I did not take offense. (User A-2)

> I've never attended a student society meeting. Why? There is no way for me to get there. I have to pass ten thousands of roads to come here, and I have to be in the same club as one of my friends. With whom will I get there? That is the problem. I have never been there, solely because of the physical conditions. All of the meetings were held here [in the prefabricated buildings], but I did not attend any of them. It's not possible to attend those meetings.... There is no equal access due to the physical conditions. For example, theater festivals were organized at that time; they still organize them in the Faculty of Architecture. I have to find a friend to go there. You know there are stairs. This is the simplest example. The most common event that everybody can attend, even the Spring Festival concerts, cause problems because it's not possible to climb the Stadium. It could be made possible since there is a suitable area there. (User A-4)

> I am living, knowing what I can or cannot do. I don't say, 'let's go to the theater!' Likewise, I don't choose to take a language course because I know I cannot go there ... I do not think I could fully experience campus life. That did not happen. If you don't hang out with your friends when the course ends … You know, if I wanted to do so, I would have done it, but I don't like pushing the limits. For example, my friends were staying in the dorms here. They may have said 'Let's have a picnic,' or 'Let's do something after the lesson' … But my mother was waiting, or I couldn't come to the campus on Saturdays. As I was unable to come here by myself, I could not join in when they said, 'Let's come to our dorm to hang out,' or 'let's do something at the weekend.' (User A-5)

Due to the existing spatial obstacles on the general pathways, SWDs have to use longer routes, resulting in losses of both *time* and *effort*. This affects the participants' ability to join planned or spontaneous activities, and generally limits their level of use of the physical campus environment. For instance, the Çarşı building complex and its surroundings offer diverse facilities, such as banks, restaurants, cafes, a pharmacy, a supermarket, as well as indoor and outdoor spaces for partaking in leisure activities (Figure 4). All campus community members use these facilities often for meeting and socializing with friends, or for fulfilling their basic life needs. The participants of this study are able to access this area and use almost all of the facilities; however, access in and around the area is not enhanced on an equal basis, with as a number of spatial barriers exist, including level differences and unsuitable ground surfaces. This deters students in wheelchairs from using these spaces, as explained by some of the participants:

> I don't do anything [during break time]. Let's say that I have a two-hour break; it's not possible for me to go to the Bazaar, particularly if I have to return, as I have to cross many roads and overcome a lot of obstacles. It is actually not easy to return to the department [the Faculty of Humanities] from here. Of course, it is a huge waste of time, because it is not easily accessible. (User A-1)

> We were going to the Bazaar. My male friends were fabulous. Even if one of them says 'Come on, let's go; I'll take you there', you do not want to go. So I generally said, 'Who needs it? Let's stay here.' Even if I went, I knew that it would be a long and tiring journey. So I said, 'Forget it!'… I am able to go all

> around the Bazaar. It is accessible from the ground floor, and I can also go upstairs. My sister and I like to go there. (User A-5)

All of the participants stated that if circulation route to a building in which an event is being organized allows independent access, they will certainly join an event if they are interested in it. To exemplify, the Culture and Conference Center on the METU campus hosts many academic and social activities, and welcomes all participants, including those in a wheelchair. It can be noted here that although there are spatial challenges, they can access this facility, but if a barrier exists in the outdoor spaces or inside the building, all access opportunities become almost meaningless at that point: "Some of the halls in the Cultural and Convention Center [CCC] are not accessible. You need to go around back. That's why I do not attend some of the meetings held there by our department" (User A-1).

All of the participants avoid travelling round the outdoor campus spaces in the evening, although they sometimes need to if they want to take part in optional educational, social or leisure activities. One of the main reasons for this reluctance to move around the campus in the evenings is the shortcomings in the physical environment. For this reason, enhancing accessibility through the design of the most commonly used pedestrian routes is essential if the university is to provide equal access to certain activities. User A-3 exemplifies this situation:

> I try not to be on campus when it gets dark. I don't go anywhere that I don't know well. I usually explore in the mornings. Sure, it would be great if many things could be reached even in the evening. For example, I'd like to stay in the Library until the evening. (User A-3)

The inaccessible public transportation vehicles that serve the city and the campus remain as one of the fundamental barriers to wider social participation in campus life. This mandates the use of manually operated wheelchair, which limits substantially the physical activities of the participants, and thereby their physical and social involvement in campus life. For those who use manually-powered wheelchairs,

travelling between buildings within the campus is possible with assistance, but sometimes the wheelchair users want to enjoy a sense of autonomy through single-handed and independent movement through the outdoor environment, allowing them to relax without the need of assistance. The below statements from one participant clarify this viewpoint:

> I was unable to spend time outside the department. You know, I couldn't hang out with my friends after the lesson, since my mother would be waiting for me. However, when there was a special occasion, an event or a meeting, I attended, and my mother would come to take me home afterwards ... Of course, someone had to be willing to take me there. I was going to the spring festivals. When I said, 'Mom, I'm gonna go to a concert,' she would go home. However, we were always going on foot, so my closest friends were my male friends. There is a very long hill here [Department of Business Management], and first we needed to climb that hill, and then the other sides ... If we had a course at another department in the morning, I would go there by car, for example ... while I was studying, they made it easy for me, but you do not feel like a METU student ... The feeling that you always need to be with someone is so bad. It is nice to hang out with my friends, but I cannot go out for a walk by myself when I get annoyed. I don't have the chance to move around while listening to music, wearing my headphones. If the class is over, you have to stay there. When people are leaving, they would ask 'Will you come?' But, I can't. You know there is no other option. (User A-5)

5.4.2 Experiences of the User group B: Students with visual impairments

Vertical or horizontal, natural or built boundaries are important elements for all participants, affecting their easy, comfortable and safe access to buildings and outdoor spaces, like their counterparts with no visual disabilities. How the users perceive the outdoor environment with the help of these boundaries is explained in terms of four design aspects: *(1) surface of the ground, (2) level differences, (3) natural and built environmental constituents,* and *(4) spatial layout*.

5.4.2.1 Circulation in the outdoor campus environment

The access mode of the participants is explained from two perspectives: (1) access to the campus; and (2) access within the campus. While two of the nine participants with visual impairments live off campus with their families, the other seven live in the dormitories within the campus. All of the participants were able to independently utilize public transport to access the campus. The participants' choice of transport mode affected the user's physical behavior, as indicated by User B-3: "I've been using this road [going on foot from the A1 entrance gate of the campus] more since the Metro opened (Figure 15). Previously, I was using the other line after entering the campus by minibus".

All of the participants usually prefer to move around the outdoor environment on foot, except in heavy weather conditions. User B-5 explains this as "Walking in snowy and rainy weather is more difficult than on a fine day ... If I faced difficulties, I used the ring buses. You know the campus has a lot of advantages". The participants living on campus can use public transport in heavy snow and rain, both to move about campus and when they need to leave the university. All of those who are blind or with vision loss stated that they valued the fact that public transport stops have been established in a definite place, and that all vehicles stay for a while to allow the passengers to get board or alight.

All of the participants stated a preference for walking when accessing spaces/buildings in the campus rather than using a shuttle, whether at day or night (Figure 15). Walking is the best way to gain a true perception of the physical environment using different senses, such as touch, hearing and smell, which is essential for easy and safe access to the desired destination. The thoughts of a participant with 85 percent vision loss explain this issue:

> Here is a flat, very comfortable and nice Alley, but everywhere is nice in METU, so I don't use the ring service, preferring to walk. Moreover, I have trouble figuring out where to get off. It's moving fast and is crowded, so you cannot see very well. I get confused and cannot tell where we are … Sometimes I may get off in the wrong place. (User B-7)

Since all participants with canes had generally travelled around their residential environments with the assistance of family members or friends, they, in real terms, started to acquaint themselves with independent movement as soon as they began to live within the accommodation provided on campus. This promotes considerably the independent and easy involvement of the participants in campus life while developing both their independent movement around the setting and their personal self-confidence over time. Although it challenges their physical access to spaces in the beginning, it offers advantages for independent living on campus. One of the participants (User B-3) prefers to stay in the dormitory on campus, although her family lives in the city. The below statements of the participants clarify this issue:

> My high school was just a stone's throw from my home but my mother took me to the school. It was so wrong, but there are cars parked on the sidewalks. You cannot walk on the sidewalks, so you have to use the road, but there are cars on the road. 'What will you then?' They are right, but I am also right! Unfortunately, it caused trouble... Living in a dorm helps to gain my confidence to go and come independently, because you're able to go by yourself… You build self-confidence. (User B-3)

> My ability to act independently has developed here, and it is still developing. University is a turning point in that sense, since you're alone. If you stay in a dorm, it is great. It has contributed to my personal development. It is something that improves your self-esteem. (User B-8)

> I was using a cane previously, but less than I do now. I started to use it more actively after coming here. I hadn't needed to go any significant distances before coming here. During summer months, I was with my family. If necessary, I was using it for short distances; but normally I would go or come from somewhere with others. (User B-5)

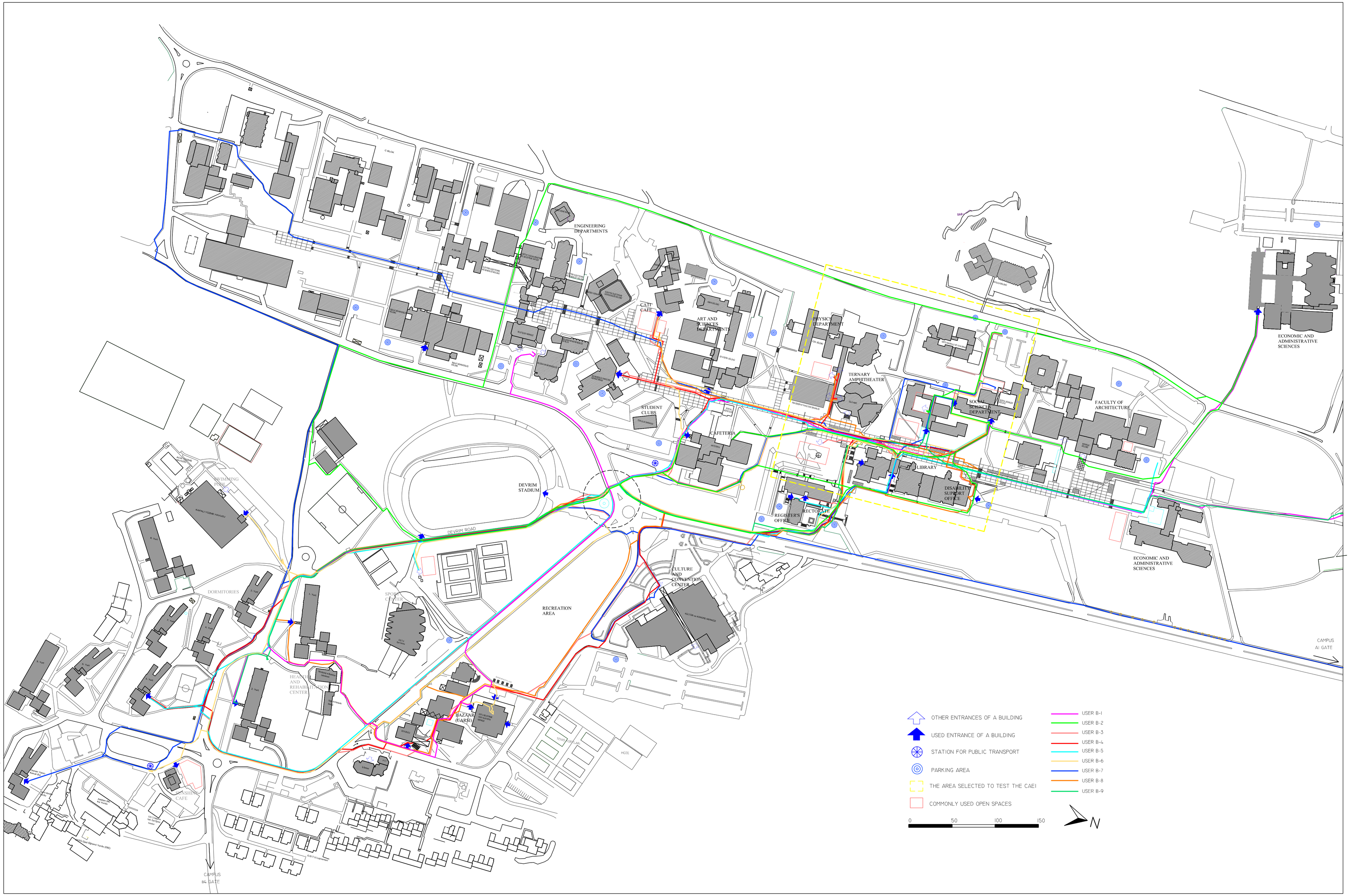


Figure 15: A map displaying the physical activity patterns of students with visual impairments

5.4.2.1.1 Spatial factors

Surface of the ground

The typical surface finish for pedestrian areas on campus is large areas of broken stone, interspersed with smooth surfaced linear bands. This is a typical feature of three main pathways on campus, most notably in the Alley, as the most commonly used pedestrian axis in the campus (Figure 16 and 17). This ground finishing makes walking with a cane harder, resulting in physical tiredness, and so all users stated a preference to walking on the linear smooth-surfaced bands. The straight and smooth nature of these paved surfaces make walking easier, but serve also as an important tracking tool for orientation, thereby providing faster access. It was generally accepted by all participants that this type of surface covering helps in their orientation to a significant degree, since the difference between ground finishes allows good tracking of the route. If the surface was completely smooth, navigation would be difficult, and this outweighs the benefits of having a smooth surface to walk on. Regarding statements of the participants are as follows:

> After learning the roads, the terrain [uneven terrain] is not actually that important. I mean you can take any route. It is not as difficult for us as it is for wheelchair users. After all, you can go as long as your cane goes… Once I have found here [straight line], I walk straight without turning right or left. It makes things easy for me. (User B-1)
>
> While going to the department, I use this path (the Alley) a lot. When you come to this line [straight line], you walk straight without turning right or left. When you come to the stone path, you turn left slightly and take the path. In this way, you manage to get to the department directly. (User B-2)
>
> There's a flat terrain over there. I prefer walking there because it's easier and more convenient. It is fortunate that we have this, otherwise I would need to change my style and use a cane, which is very tiring on the wrist... Walking here is relaxing … Ah! These lines end here. So I say, 'Ok then' and examine whether there are any on the right or left side. I've managed to find them in

this way and take the path. I always try to find them. If I don't, these stones tell me that I am in the Alley. I know where I am. So no problem! (User B-3)

I was following the main road (from the Alley) used by everyone along the route with the cobblestone pavement, without using the crossing. Walking on this road is convenient. Following the straight line between the cobblestone pavements after finding the stairs here [at the entrance level of the Department of Architecture on the Alley] is comfortable for me … Walking straight and fast on the cobblestone pavements is difficult because the cane gets stuck there. The cobblestone pavement makes it slow. Generally, everyone prefers to go here (straight line) because it's more comfortable. (User B-5)

Here, I think, it is important [flat ground line in front of the Bazaar], (Figure 17). This leads me directly here. For me, it's so difficult to walk on the yellow line, and it hurts my feet when I wear high-heeled shoes. I think it is not ergonomic. A different surface is much more convenient for me. The color of those yellow lines becomes very distinct in the rain, it is visually very useful. I don't know why. Maybe it's because the ground gets so dark when it rains, so they shine in the rain, but is it necessary for them to be yellow? They are supposed to be in contrast to the ground. (User B-8)

Figure 16: Paved surface finishing of the Pedestrian Alley, as the main public realm on campus

Figure 17: In front of the Bazaar [Çarşı] building –one of the central locations for eating, meeting with friends, socializing and various basic needs

Figure 18: Variations in the surface finish in front of the Library Building

Figure 19: View from Revolutionary [Devrim] Road

At points of the pedestrian network with diverse tactile floor surfaces, especially at junctions, the participants experience considerable ease of navigation (Figure 18 and 19). In some areas, they have difficulties in wayfinding due to insufficient spatial clues as shown in Figure 20. It should be noted here that, the participants' knowledge of the differences between finishing materials is essential, as highlighted by User B-5: "I am accustomed to using that road... I can understand where I am when I come to a different place. It is like a sign. Of course, that's because I know the area well".

Within the analyzed spaces of the campus, the surface finishing of the sidewalk is almost flat, and is the same at every point, which generally allows for the appropriate and comfortable movement of all of the participants. That said, the participants sometimes experienced difficulties at certain parts of the sidewalk due to the rough surface finish. Speaking about the insufficiencies of the surface finishings, one of the blind participants said:

> Whenever I begin to walk slower on these sidewalks, people think that I do not know the road. No, I know it, but the cane gets stuck. You move right or left to find a safer way, so you may lose your way there. You may also come across a tree. It's like a lane shift. I'm looking for flat terrain. (User B-3)

In this respect, the quality of the surface finishing plays a significant role in informing the participants that they are moving the right direction, allowing easy and timely access in even snowy days (Figure 21).

Figure 20: The part of the Alley where the participants had difficulties in finding the pathway (near the Social Sciences Department)

Figure 21: Alley in the winter

Level Differences

The pedestrian pathways in the campus generally permit easy tracing without security risk, as their edges are mostly at the same level as the soft lanscaping. While travelling through pedestrian areas, the participants are guided by various aspects of the built and natural environments, such as the borders of hollows (i.e. pools, high platform borders) and staircases. Border lines make orientation easier, but large level differences at borders may create safety-critical circumstances when there is a lack of design measures:

> Once I almost fell from the right side there (stairwell). I understood how a handrail is important … I got angry about these stairs at first because they are

> crooked! I mean if you follow the stairs, you end up on the grass. These are the routes I am using the most. Here, for example, if I go towards the right side too much, there is a trash can, or I may fall down [the stairwell]! (User B-1)
>
> Here the curbs cause trouble. I wish there were serrated ones at least! … A little height difference at the edge would be a security measure, and people could sit on them as well. (User B-8)

Steps, staircases and sloped surfaces do not adversely affect the participants' access, as long as their formal features (i.e. height, width and depth of the stairs, ground surface and slope of the ramp) are properly designed and applied according to appropriate technical design specifications. For seven of the participants with different degrees of vision, enhancing tactile border lines with a contrasting colour is essential in providing safe access. Due to a lack of such measures in the experienced environment, they try to take transitory cues from the illuminated and shaded surfaces that result from the difeferences in levels. The below statements explain this issue in the participants' own words:

> Now, for example, you can see shadows on the stairs. There [on the surface of the stair steps] appears a high contrast. I can see and distinguish things very clearly because of this, so I'm able to walk normally. At different times during the day or in the evening, of course, this may change. (User B-2)
>
> Sometimes I get confused about the height of the stairs. I may suddenly place my foot and fall. There appears such a line at the ends, which is very nice. There are some stairs that you cannot understand; you know there is a staircase, but you cannot see where it is. So the tape at their ends is so cool! (User B-4)
>
> When the stairs go down, I sometimes cannot see. Look! For example, these [steps] can be seen, as light falls on them and they cast a shadow on the ground. They wouldn't be seen otherwise. This being the case, I am walking slower because it is hard to see where it is ... It is always the same; it is indistinguishable without shadows because that appear to be adjoining. If there is such a color difference on the ground, I certainly think about it. (User B-7)

Changes in levels on the sidewalk, generally in the form of sloped surfaced parts and ramps on or at the boundary of the sidewalk, help make access and orientation to goods

and services easier on campus. These are also crucial parts of the sidewalk that allow equal access to wheelchair users. When providing a ramp, the location, slope, surface finishing and smoothness of the curb ramp deserve important attention, so as to meet the spatial needs of each user group in this study. The accessibility level of a ramp depends mostly on the design of the sidewalk itself in terms of height and width.

Figure 22: The most frequently and easily used crossing by the participants.

Figure 23: The participants cannot use, or even know about the displayed crossing, located at the centre of most commonly used area, due to a lack of perceptible information indicating its presence.

For wayfinding, curb ramps are vital parts of the built environment, showing where users cross the sidewalk (Figure 22). That said, some of the street-level crossings raise a complex situation for the visually impaired, since curb ramps are not generally located at the axis of crossings on campus (Figure 23). The act of crossing sometimes raises problems, and so they generally ask for assistance. User perceptions of this issue include:

> It is at the street crossing points where I have the most problem in METU. I just don't get it. Here, for example, I need to walk across the street to go to the Bazaar, but I don't know exactly from where. It's just luck… Generally,

> someone comes and asks, 'Where are you going?' Then I say, 'To the Bazaar. Ok, let's go.' That's why there should be a sign here. (User B-3)
>
> Here, the sidewalk turns before the crossing point, so I go ahead a little bit and then cross the street. I also get it from that curb ramp… [During another crossing] The sound of a car; if it stops, the brake squeal turns out to be a sign… If there was a sign on the pedestrian crossing I'd understand where the crossing was, but there is not. (User B-5)

Environmental Components

The types and locations of the components of the natural or built environment dictate the level of equality for the participants in their use of the outdoor environment. While they sometimes function as orientation aids, these elements can lead to uneasy and unsafe access due to unperceivable protruding objects, especially for the participants who use a cane. The main hindrances affecting the participants are overhanging branches of trees, shrubs and unexpected bins on the pedestrian routes. Such features make the participants feel uncomfortable, influencing negatively their easy and safe transfer between spaces. Those with limited vision can identify contrasting colors in the sunlight between the built environments and the intensity of tree branches; but twigs protruding from the trees can also create stressful and insecure situations. On participant describes their experiences in this regard:

> I can see the bodies of trees. I don't have any problem with thick objects, but thin things ... I sometimes cannot see them, despite being close. It has happened to me many times, so it would be better for me for the trees to be pruned from the bottom. At METU, there are a lot of trees, and branches that grow longer. I'm aware that this causes problems not only for me, but also for others. (User B-7)

Some components are fixed in a location, allowing their use as an orientation aid. These environmental elements may be useful if located at junctions, as emphasized by on participant: "*There is the bin here. It is my sign. If I go towards my department, I*

turn right here." (User B-1) Generally, identifying such cues requires some time, and so thus there should be design-oriented solutions to enhance the perpetual efficiency of the physical setting for use.

Figure 24: Pool located at a well-known junction

Figure 25: Staircase and the side wall of the pool are adjoining in front of the Rectorate Building

The sounds that eminate from both spatial and non-spatial factors are an important means of orientation, as declared by one blind participant:

> I need to hear 'sound', as it's kind of what I do! Carrying or looking at something … I cannot concentrate on two areas. For example, I don't answer my phone when walking on the road. I don't speak either, since there are so many hints that I have to follow and that I may miss. If I miss them, I am certain to lose my way. This has always been the case, without exception. (User B-3)

Existing built environmental components along the pedestrian access function as important orientation tools, enhancing both a physical boundary for tracking and providing a reassuring sensory reference point (Figure 24). Based on the spatial experiences and perceptions of the participants of the study, the most useful built elements in the outdoor environment are pools, which exist in a variety of locations

across campus while heading for a particular destination. Their meaning for those with visual impairments is based on the sound of flowing water, although their design may cause confusion when a pool and another part of the outdoor environment are placed side-by-side. As shown in the Figure 25, all of the participants, especially those who use a cane, perceived the edge of the pool as a stair, which has resulted in severe accidents for four of the participants.

> First you need to check with a cane to see whether it is a place to go up ... as you may fall into the pool. I heard that someone fell into the pool in front of the Rectorate Building … A few people have confused it with the stairs since it is so close to them, and someone even fell into it … Here, for example, while going to the Library, if you turn right a bit more you may end up in the pool. I almost went into it once. (User B-1)
>
> We had a pool here. It does not talk! I mean it does not work, I guess. [While following the edge of the pool]. Aha! Here is the entryway. And there, it goes through the Rectorate Building. Whenever I hear the sound of the pool, I say, 'Oh, OK!'. (User B-3)
>
> The pool is noticeable. Its color changes inside (Figure 24). There is an obvious difference inside, since it is dirty. It is something which says, 'I am here.' I guess there is water here. (User B-7)
>
> The pool of the Department of Architecture, for example, was very useful for me. I say, 'Huh! I've come to Architecture.' You can also understand the location of the entrance, since the pool is a leading sign. It would cause trouble if its sides [edges] were open. (User B-8)

The sounds of the flow of people also ease wayfinding for the participants, especially those who use a cane, as explained by User B-3: "*Voices tell me a little bit. The front of the library is very crowded"*. However, densely crowded areas may have an opposite effect, as participants with a cane may not be able to hear lead-in sounds. Remarkable statements of the participants in terms of the perception of the spatial environment by the help of sounds are below:

> The loophole there [in front of the library entrance platform] is very useful. When I get there, I say 'Okay, I haven't come to the pool yet.' Aah! Once I

> stepped into pool a little bit. That loophole tells me that I have saved the pool! While people are stepping on it, I feel it out. People also direct me. I mean you can understand from the flow of people… Here the pool says that I have come to the stairs, the library. It always works there, even in the winter. (User B-8)
>
> It would be much faster if I went to METU Bazaar (Çarşı) to buy my food, but I prefer ordering, because the Bazaar is very complicated, very crowded ... The crowd makes it difficult for me to differentiate between the guiding sounds. Sounds let you know that you're close to the building, but I cannot hear the sound of my walking sick in a very noisy place. In a crowd, you may hit someone in any case... When those coming in the opposite direction don't see, they may step on your cane. It is bothersome then. (User B-1)

The design of lighting equipment is important for all of the participants, except for those who are totally blind. When there is a lack of daylight, they function as an indicator for wayfinding. Furthermore, they also serve as guides and so can be used for easy orientation, especially when there are few orientation cues in the spatial environment (Figure 26). User B-8 indicates its importance while stating "illumination is important in all cases. If specific places – particularly both sides of stairs – are illuminated sufficiently, I can go from there by centering it".

Figure 26: The lighting element shown is utilized by the participants who use a cane to identify their turning point

Environmental elements on the sidewalk, such as bins, lampposts, traffic signs and trees, provide a perceived equality of access for all of the nine participants, especially the six who use canes. Although the campus is generally considered to be a user-friendly environment in this regard, there are some exceptions. Firstly, easy access may be hindered by these elements, as protruding parts may cause accidents that can be severe (Figure 27 and 28). For this reason, the participants may feel anxious while walking along the sidewalk, and may sometimes prefer to walk on the roadway. For the participants with partial vision, if protruding natural or built elements are in a contrasting colors, it is easier to perceive them, making the use of the sidewalk easier. Secondly, since the participants with canes tend to walk by perceiving the edge of the sidewalk with their canes, such protruding components may prevent easy orientation, as well as easy and safe access along the sidewalk. Regarding experiences of the participants are stated as follows:

> There are trees on the sidewalk that cause much trouble as they make it difficult to pass, so I do not use it. I don't use the sidewalk, but the road. (User B-1)
>
> Whenever I have to walk fast to get to class on time, I choose not to walk on the sidewalk (on which there are trees). (User B-2)
>
> When my cane touches a tree, I move right or left, and try to find the best side to pass. Sometimes I miss the lane, so I may hit a tree when going right or left. That's why I'm holding my head. One of my hands is always on the alert. I pay attention not to carry anything with the other hand while using a cane. (User B-3)
>
> I notice trees by their colors, when a different color appears, or because of the ground, the soil. Of course, they reduce the width of the sidewalk. (User B-4)
>
> Indeed, trees in the middle of the sidewalk cause trouble for everyone, regardless of whether it's somebody with a pram or two friends walking side-by-side. In addition, the opening [in the surface finishing] at the bottom can make your foot slip. (User B-5)
>
> For example, I'd like to go along the edge. Trash cans may be over there… I feel bad when my foot touches them while wearing toeless shoe in the summer. I think they are very badly positioned. If I go straight, there is certainly one at the corner… There are stones at the bottom; is that to prevent them from

moving? Also, their places are not fixed, as you know, otherwise they would be a sign. It would also be great if they had a slightly different color … and if these roots and shrubs on the ground were cut ... because they may leave scratches. The biggest accident I've ever had was because of a bush that resulted in my pupils being scratched. Both of them! Not my eyelid or nose, but directly my pupils! (User B-8)

Figure 27: Dustbin at the edge of the sidewalk

Figure 28: Trees in the centre of the sidewalk

Non-spatial factors such as pedestrian flows, diverse types of sounds (i.e. people, pools, and cars) and odors (i.e. from restaurants) in the near vicinity all significant elements for wayfinding.

Spatial Layout

The participants need to get to know the general spatial layout of the circulation route. The participants' perception of the spatial layout is influenced by the existing landmarks that exist along the circulation route. When buildings can serve as reference points along this linear movement axis, the participants can be easily lead towards them. As observed through the commonly used circulation routes, the Alley and

Devrim Road (Figure 15), the continuity and straightness of the spatial layout and adequate and continuous traces along the boundaries of this spatial layout support significantly equal access to spaces and buildings. Since the participants with maximum 15 percent vision cannot recognize the appearance of buildings and other spatial arrangements at night, perceivable design-based guidance through the circulated layout is also important for them. The statements of the participants below clarify this issue:

> There is something like a 'cognitive map' in my mind for the paths I am using. Something like right or left. By constantly using the same paths, you can clarify them with someone. (User B-3)
>
> I cannot see details. I just know where it is at METU. I mean I cannot recognize details of a building. Let's say that I can take you to the Dormitory 5 because I know its location. I walk very carefully, paying attention to where a place is located, where we're going or which streets we are using. I have their locations in the campus stored in my mind... I need to know where the door is, or whether there are stairs in front of the door. Sometimes I dive fall into the bushes, or [trip on] rough roads when I do not know the more convenient routes. Once I learn, I use them easily. In fact, I can also describe an address perfectly since I'm careful. I put up signs, for example. I picture it in my mind while describing it. I keep in mind something that I see when turning right, and then tell myself to turn right after seeing it and go ahead until I see another sign. (User B-4)
>
> I manage to find my way easier when I walk along a path I know rather than asking for support. The campus makes me feel at ease in some aspects. For example, in Kızılay [the City Center], someone comes and wants to help me, and then takes me to where I am going so that I can 'feel at ease.' However, this is not the case at METU. People help me when I need them. It is more comfortable for me in that sense. I find it personally important that here is as protected as it is. (User B-5)
>
> I moved into the dormitory, and my family came to visit. We walked around together for one week, so I learned (the Campus). In fact it's easier to learn when alone. Then I ran into trouble; you know I remember those times. Once there was a distant place. Where is it? I do not remember. I got out of the ring bus and suffered while returning from there. It is partly my problem because I cannot see the environment. I can see buildings and trees; no problem! But I've another problem: The image becomes blurred with distance and gets smaller. I cannot see what it looks like – for example, which building? Also I can only see the captions on the road and street signs when I come near ... I don't get it from the shape of any building here. I actually feel glass surfaces a little bit

> [when it shines with the reflected light] … I know it on the map; it works. I asked [someone] about it when I first came here, and they told me that it was the Library, so I learned … It is much easier to see where the turn is in a narrow road. It's difficult in a wide road to see where the road goes, or where the turn is ... Even so, I can see many things (on the Alley) as it is wide. As I said, it would be much easier for me if there were 'colors' or if there weren't any branches, as I mentioned before, as they may injure my eyes. (User B-7)

Due to the consistency of the perceivable orientation cues formed by the physical environment, all of the participants can easily and independently use it to access outdoor spaces and buildings. Devrim Road can be given as a foremost example in this respect (Figure 15). Its clear width and simple spatial layout and all of the spatial traces that exist at its two end points (changes in surface finishing on one side and stairs on the other) promote ease of use and navigation through the road (Figure 29 and 30).

> The terrain of the Revolution Stadium (Revolution Road) is flatter, so I'm using there. Moreover, the traffic becomes louder because of passing cars on the road side ... Obviously, you have to use any kind of sign, because there is no way. This drain is a sign, for example. It's iron; the cane doesn't get stuck in there unless it is a big hole. If it does, it causes trouble, of course. This [stone flower bed at the side of the stairs] is also a sign. (User B-1)

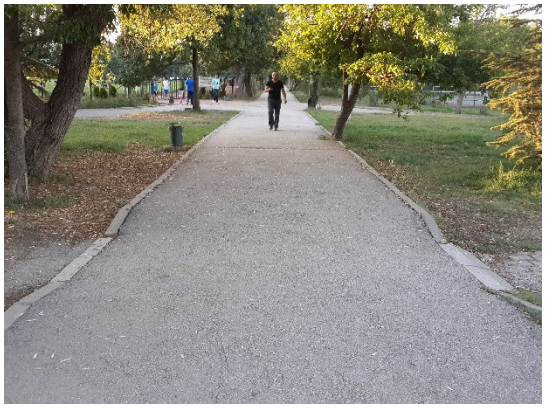


Figure 29: Revolution (Devrim) Road

Figure 30: One of the end point of Revolution (Devrim) Road confronted with a stair

On a large paved pedestrian circulation route where the participants have difficulty in finding the edge boundary, the participants need diverse design-based wayfinding indicators. The spatial experiences of the participants through the Alley can exemplify this issue. Its distinctive surface covering, the existence and location of the stairs, the built and natural environmental elements (i.e. diverse types of sounds, bins) serve as holistic guides for the participants, permitting independent wayfinding throughout the entire process of walking through the Alley. All of these spatial components work as parts of a chain in spatial orientation. If there is a deficient part of the chain, perceiving the spatial layout becomes difficult. The participants make the following remarks about this issue:

> There's a flat terrain over there that I prefer walking on, since it's easier. Stairs! This tells me that I've come close to Çatı [Café]... I know here that when I go down 1, 2, 3 stairs, I will come to the Library... Of course, the water sounds! It becomes a sign for me, just like that. (User B-3)

> I was following the main road (from the Alley) used by everyone, taking the road with the cobblestone pavement without using the crossroads. Walking on this road is convenient. Following the straight line between the cobblestone pavements after finding the stairs here (at the entrance level of the Department of Architecture on the Alley) is comfortable for me… I also know that I will go directly to the stairs when I go there... You know certain things; for example, if you turn right from a place close to the bottom of the next stairs, you come across a path that goes to the Department of Architecture. You know, flat stones and counting stairs helps me to go to a place... We've come to the road of the Department of Economics. How do I know? From these stones! Here I am assuming that I am going towards the entrance. In fact, there is no sign. Ok, here [we've come to the stairs] is the exit of our department … There is the step in front of the Library [taken as a sign]. When you reach there, you understand that you've come to the Library. There are… small water pools, if there is any water in them. I try to take fixed things as a sign. It is generally what I do. (User B-5)

> We walk straight (along the Alley), although we move slightly right or left, but we're here after all. The Alley is not a problem for me in terms of entrances, exits or stairs. It does not matter unless it is disorganized. However, the terrain is difficult for wheelchair users. [He hesitates] There are benches over there ... I've noticed something around here. I am not paying attention while talking with you. I do not know, maybe because I am with someone, or I am talking. These [straight lines on the ground] may be useful in helping me walk straight.

> We've come across trees. [We need to move aside from the straight line]. Sometimes I am not able to distinguish the entrances. Çatı [Café], the Departments of Physics and Humanities... The order of these stairs is important. It has become a sign for me, like 'I passed the Chemistry Department,' or 'I am close to MM Building' [the Central Engineering Building]… I'd like to know exactly where to turn when I've arrived somewhere. Otherwise, I know that 'the Department of Humanities is on the left side of me' but have difficulty in understanding where the entrance is. This is not the case for the Faculty of Architecture, as there is a pool there! (User B-8)

For the blind and visually impaired participants, the sidewalks are one of the most important parts of the outdoor campus environment, providing benefit to them in terms of safe and easy access, and especially orientation around the exterior spaces and buildings (Figure 31, Figure 32). One reason for this is that they are designed to permit clear and continuous circulation in the travelled area. The design of the pavements with the blind in mind supports considerably their independent movement, and encourages the use of a cane. The participants who need to use a cane to traverse their residential environment have little opportunity to utilize it, since they generally go outside with somebody until their enrollment in the university. Accordingly, it was only after taking up residence on campus that the participants that use a cane began to travel independently around the physical environment.

In the campus, all of the participants with a cane were able to use the sidewalk independently, easily and safely by following the edges on either side. The boundary of the sidewalk is used for going forward at the appropriate axis along the sidewalk. Perceiving both sides of the sidewalk is important for the equitable access of users with some sight loss, as stated by the participants:

> People often say that I need to avoid getting close to the edges, but the edges are good for me, and so I follow them. I prefer walking along the edges if there is a sidewalk. I've never fallen off; it is not easy. The edges help me to find my direction … The easiest way to find my direction certainly by the sidewalks. They are straight and the destination is certain. [On the other hand] the Alley

is so wide that it may go towards right or left. Have you ever thought about where you would lose your way? On a road or in a forest? What if there were no buildings while walking along the Alley? You may have difficulty in understanding where you are, or what you are doing. (User B-8)

Figure 31: The most commonly and easily used crossing for all users of the campus, providing perceivable spatial information at each side, with a curb ramp and stairs

Figure 32: Surface and level changes on the sidewalk make orientation towards the crossing easier

The perception of the spatial layout associated with the physical features of sidewalks is affected by multiple spatial factors for the individual. Herein, the continuity of the design elements for wayfinding is a *sine qua non* for the equitable access of students with visual disabilities. Moreover, the fact that the participants of the study utilize the most common circulation route of all campus users is also important in their garnering of knowledge from such non-spatial factors as sounds, as mentioned in detail in the Environmental Components section above.

5.4.2.2 Approaching outdoor spaces and buildings

A lack of design-based indicators in the outdoor environment makes access a time-consuming and challenging task (Figure 20). The informed design of the ground

finishing in particular would promote easy access to buildings, as expressed by the participants: "*When I hear the sound of pebbles on the ground, I know I have reached the building"* (User B-3); "*Differentiations in ground finishings is very important ... the evenness of the ground everywhere prohibits [me from gaining] a sense of orientation*" (User B-8). Due to insufficiencies in the design of surface finishings, all of the participants using canes frequently come across ambiguous and uncertain circumstances in their orientation towards buildings and spaces. Looking for a boundary between surface coverings and existing constituents of the spatial and non-spatial environment, such as dustbins, lampposts, sounds of people and pedestrian flows, help the participants with severe vision loss to find their way in times of confusion. Among the participants, those with the ability to perceive contrasting colors in daylight can identify the pathway, but this potential confusion returns in low light.

> Here, you need to go straight a little bit, and then turn left slightly to go to our department. A few times, I've found it difficult. There is no sign here, but gradually you … get used to it ... You know you find the trash here. In this way, you get to the entrance. (User B-1)
>
> I would love to follow the side of the road, where I am sure there will be no obstacles in front of me … Following the line where the soil meets the sidewalk makes it easier for me to reach my destination ... I used to use this path to get to the Faculty of Humanities. I need to find the sideway to understand where I am; I need to find the part where it unites with the land. This dustbin was also there! I know I need to go in turning slightly from here; but I need to find the way by following the land (soil) there, if I can! Otherwise, I would lose my way … So I'm trying not to consider those things that can be easily relocated, such as the dustbin, as a sign. That said, in the METU campus, such items are not generally relocated, which is good for us. (User B-5)

An unchanging sidewalk finishing results in a lack of information to visually impaired users in their efforts to reach their destinations (Figure 35). Accordingly, the sidewalk surface should be designed to provide information to the users at an appropriate time and location, allowing them to orient towards and access their destinations from the sidewalk, or vice versa. One of the users explained the importance of this situation as follows:

I wish there was also a sign there [on the sidewalk, while turning to the entrance of the building], but unfortunately there isn't one. You know if we overcome the problems in crossing the street at METU, or having signs at specific points, I would be in seventh heaven. I have trouble crossing the street; I cannot deny it. I'm not complaining, as I am a person who is able to develop gradually. Even coming to this stage is a big step for me. (User B-3)

Figure 33: Viewpoint from the entrance platform of the Library building

Figure 34: Sloping surface with changing tactility

The various level changes (i.e. sloped surfaces or steps) contribute significantly to the orientation of all of the participants around the campus. For instance, for those with a white cane in particular, the location of stairs, entrance platforms with different surface finishings and sloped surfaces along the route allow the users to identify their location in large open outdoor spaces (Figure 33, 34, and 35). This issue is explained by two participants with severe vision loss who use a white cane:

When we walk straight, there is a slightly high sidewalk and a sloping step over there. I do not like sloping steps, since they prevent us from going straight. We can fall off the side. It's not safe! That said, something that causes trouble may be a sign. They can be found also in other departments, but this sloping step is a symbol of our department! I say that 'I've not come to my department yet' if I have not yet come across these steps. So something which causes a safety problem may also be a sign. (User B-3)

This place is very important for me. Such a platform is great for me. It tells me, 'you've come to the Library' or 'you're in the middle.' However, now, I'm having difficulty finding the entrance of the Department (of Humanities). I've thought about counting my steps, but I've never done that before, as I don't like it. I sometimes miss the entrance to the department. Now, the sun is shining, so I won't miss it. I have to find something to serve as a sign, because sometimes I miss it. I find it when I return from the stairs leading to the Department of Architecture. It is not so easy to find here. I ascend a step here, and then walk towards the department. (User B-8)

Figure 35: Different types of ground surface finishings between the sidewalk and the pathway provide a perceptible spatial reference, but it would be more efficient to extend this finishing to the roadside

The above comments highlight two common features of the most commonly used circulation routes, the Alley and Devrim Road, being their simple and coherent spatial layout, and the enhanced uninterrupted spatial orientation cues that exist along their lengths. In contrast, in the Çarşı area, independent access between the buildings and the outdoor spaces is more difficult for the participants, especially those with a cane, on account of the lack of such features (Figure 15). Participants with canes use mainly temporary and changeable cues, including smells and the sounds of such environmental elements as pools, ATMs and supermarket cash registers in the

surrounding environment. In this sense, for the realization of a more user-friendly use of the outdoor environment, it is essential to increase the number of permanent and continuous spatial indicators in a consistent way.

Figure 36: Entrance platform of the Library

Figure 37: Portico of the Architecture Building, which is connected directly to the main circulation route: the Alley

The physical features of the pathway along the travelled route can contribute to the equitable and easy orientation of all. Based on the spatial experiences of the participants, these features can be categorized under four headings: changes in levels (Figure 36); changes in surface finishings (Figure 37), contrasting colors of the ground surface; and environmental elements that can be perceived in different sensorial ways. These diverse spatial factors are used as essential means for orientation between outdoor spaces by the participants, especially those with a cane, in a self-assured and secure way. The following evidence-based statements detail these concerns:

> I can understand this point from the gray color of the stone – when light falls on it, of course. Or, you may say, 'Aha, the stairs are here' when crowds are high. (User B-1)
>
> [We went down the stairs] We'll come to the Library after three or four steps. Aha! This is our sidewalk [the library entrance platform] (Figure 35). The

sound of the pool! Then those battlements. It may be a relaxing factor. (User B-3)

The elevation at the entrance of the Faculty of Humanities tells me that I've arrived. There are sloping stairs... I've never had a problem because of them, but we may fall off the side. (User B-5)

Figure 38: The view of entry axis to the Physics Department

Figure 39: Entrance to the Library

When reaching the entrance of a building, locating the door without the need of help and too much loss of time is important, especially for users with severe vision loss and complete blindness. From the observations and interviews it is clear that if the spatial environment enhances the design-oriented diversity of the level of the ground and its boundaries, visually impaired users would certainly be able to access the buildings more easily and safely, like all people. The natural or built components forming the boundary of the path that guide towards the entrance (i.e. pools, seating places or walls constructed with different materials at the side of the path), changes in the surface finishings (e.g. a door mat) and ground levels, and the side of the building itself are all major signs that guide the participants to the entrance of the building. Figure 38 and Figure 39 show the entrances of two buildings that the participants consider to be easy and safe for them, since the design informs them in the various ways mentioned above:

> At the entrance I notice from the door mat on the ground that I am close to the Library [to the entrance gate of the Library]. Sometimes its door may be closed. There is a statute here, so I need to move to the right. (User B-1)
>
> [While turning towards the entrance to the Faculty of Humanities] There must be a door mat or a drain here that I generally come across. It's also obvious that we've come to an enclosed space. (User B-5)

For the access of spaces/buildings, diverse level differences on the sidewalk serve as important orientation cues for the participants who use a cane, being a key indicator of where they are on the sidewalk. Such features also contribute to the orientation of the users towards buildings and spaces from the sidewalk at the most appropriate point and time. Some of the participants are cited below speaking about this issue:

> Going to the Department of Civil Engineering is so easy. There is a curb ramp over there. When I arrive there, I cross the street. If I walk towards the left side, I come to the Department of Civil Engineering. (User B-1)
>
> This bump tells me that I am approaching the dormitory [the fork leading to the parking lot]. Soon you need to cross the street ... the road goes up and down over there. Here is the road to Dormitory 4. After another one, here is Dormitory 3 and then Dormitory 1. (User B-3)

During the interviews and simultaneous observations when identifying the spatial experiences of the participants, it was observed that they sometimes fail to notice important access and orientation cues along the sidewalk, especially curb ramps on its boundary. In this regard, it is essential to apply design measures that allow them to perceive such spatial cues at each point of the sidewalk. This design concern is also valid at the points where the sidewalk is interrupted by an entrance to a parking area. In such cases, it is obvious that spatial cues should be enhanced to inform the users about the nature of the interruption and the continuity of the sidewalk, allowing wayfinding through it.

When approaching buildings and outdoor spaces, all of the orientation cues mentioned above permit easy orientation to the right side of the route. Diversity in design measures and continuous connections among them can give the participants an accurate idea of the circulation route, as shown in Figure 31 and 32. When wayfinding spatial cues are lacking, especially in large pedestrian paved areas, the participants experience difficulties in wayfinding.

5.4.2.3 Spatial use in consideration of participation in campus life

All of the participants but one, who has been a METU student only for two months (User B-9), utilize the outdoor environment independently within the limit of their commonly used physical patterns. In this sense, aside from the effects of architectural factors, their physical behaviors depend on knowing the spatial layout. If the spatial layout involves an explicit and simple composition of pathways, it is much easier to learn and perceive the physical features of the environment. In contrast, when design-oriented references in the built environment are lacking within such an efficient and well known pathway network system, participants with canes always have difficulties in accessing spaces or buildings. For instance, within the studied field, the plan scheme of the Alley has a positive impact on the equitable access of the participants. Creating a main linear circulation axis, connected at intervals with roads and featuring the spatial factors mentioned above, it is possible to promote the independent and easy access of the participants.

The behavioral patterns of all of the participants with visual impairments which are shown in Figure 15 match commonly used spatial patterns on the campus. The three participants with severe vision loss who do not use a cane (maximum 15% vision) are also able to use other parts of the campus, as long as they know how to go there and to return.

Aside from User B-9, using these circulation areas is not difficult for the participants, since they know every point of the area as a result of constant usage. The pathways, in general, feature diverse orientation cues and measures that allow safe access, although there are some insufficiencies, especially in the orientation cues, as explained in detail above. To clarify, six participants who use a cane have experienced difficulties in finding their way to a building or entering an outdoor space, despite their frequent use of the pathways. This causes losses of time for them. When they experience trouble searching for an access route, people tend to offer help. These experiences show that the design of the physical environment of the campus can lead to problems in punctuality, and can result in some personal disturbance. One participant comments on this issue below:

> You are able to go fast and confidently to a place that you know, otherwise you go more slowly and with more control. You look like a person who seek the way around, so someone usually offers to help you. (User B-1)

For the six participants who use a cane, independent access to other parts of the campus outside their commonly used behavior patterns is not possible, and this is also a difficult task for the three users without a cane. Below are statements on this issue from two users, one with and one without a cane:

> If I know where I am and where I am going, I feel at ease. If not, I feel uneasy, so I may pass the building and have difficulty in finding the entrance. I need to go there once at least. I may have difficulty when I am alone, but it's worth it. (User B-4)
>
> It terrifies me if it's somewhere I don't know. I may change my mind about going there if I'm alone. I think this is the negative side of me. I prefer those places that are familiar to me. I'm open to new things, but I avoid going to distant places where I cannot get help when I have a problem. (User B-3)

To gain knowledge of the unknown parts of the outdoor campus setting, in the first instance, they should go there with assistance (i.e. friends, family members or staff

from the Disability Support Office). The level of presence of the participants in the outdoor campus spaces changes differs from person to person according to their level of disability and their experience of independent movement, as well as their personal attitude. For instance, for three users without canes, going an unknown place for the first time with assistance is enough, while the others need to experience a route two or three times. If a route does not feature enough orientation cues, this number certainly increases, as this active learning process cannot work to enhance independent movement if there is a lack of such support in the area. This type of learning process, leading to independent access to a wide range of spaces on the physical campus environment, can take considerable time. User B-8 describes her learning process while highlighting an important issue:

> In the early years, I walked with my friends or went by myself to explore the campus. There were times I got lost; but I have never hesitated to ask for help, because … people are kind. I still get directions when I want to learn how to get somewhere. In fact, I sometimes understand better when someone describes it to me, because I reconstruct the images in my brain. Images are important for me … but it would be better if I had a map. For example, I may emboss something now with you. [All we need is a] soft surface, paper and a pen. We can use our legs for it. There's no need to buy expensive things. (User B-8)

In parallel with the learning process, the physical behavioral pattern of all the participants within the setting can begin to expand over time depending upon the various necessary and optional activities in which they partake, whether planned or spontaneous. This promotes considerably the use of different parts of the environment, leading to increased personal self-confidence over time, as stated by User B-7.

> I hesitated a lot in the past when someone invited me to a remote location that I didn't know. In general, I have improved a lot in seven years, and I am more courageous now than I was in the past when asked to go to an unknown destination. I hesitated so much when asked to go somewhere I didn't know, because lacked self-confidence, but I resolved it. Being away from my family and living here alone has increased my self-confidence … Now, I can go everywhere on campus, but it still comes down to time. You know the

> accessible places become wider. If I find a new path, I try it first and then begin to use it. I've gained self-confidence because I probably know where to go, even if I am trying a new path. It's totally different to be in a place I've never visited before. (User B-7)

Participation to educational activities

Participating in courses as necessary educational activities is the main sphere of participation in the participants' daily activities. For such activities, their behavioral patterns generally demand walking and/or taking public transport from the dormitory to their department buildings, and vice versa.

Since all of the participants know all the physical features of the circulation route, including the easiest and safest access points and orientation cues, independent access to spaces within the spatial pattern becomes possible. If a course is held in a department building that falls outside the participant's commonly used routes, they should first learn how to get to that building or space. The process of learning independent access is closely related to the identification of existing orientation cues in the outdoor environment, as described above. Herein, learning new buildings or spaces for academic reasons emerges as a requirement, as one of the participant emphasizes: "I learn useful places if I need to, or when it is required. I've learned them as a result of a need or through frequency of use" (User B-3).

Spontaneous and infrequent actions such as meetings with an instructor or friends in different department buildings, and having lecture notes photocopied within any building in the setting, may force the user to use previously unknown parts of the outdoor environment, and they may need help to make this possible. As far as equitable participation is concerned, they should access desired spaces independently for any reason, where possible.

Participation in social & leisure activities

Participation in social or leisure activities is closely related to the personal character and attitude of the individual participants, but also the intensity of academic works. All of the eight participants with a cane, except one, want to socialize and make friends, and so they participate in diverse social and leisure activities with their friends. The typical outdoor activities of those eight participants in the campus environment include studying, social interaction, enjoying nature, walking for relaxation, taking food & beverages, and cultural, entertainment and sporting activities. It can be observed that their personal attitudes and relationships increase the frequency of their use of the common areas between/in the buildings. The student clubs in the university, when located in a well-known building by all participants, serve as an important means of coming into contact with people for studying, participating in group works or seminars, and sharing diverse campus life experiences.

As mentioned by all of the participants, lessons take up much of their time, so they cannot devote too much time to leisure or social activates on campus. In this respect, the participants frequently utilize the university's most commonly used spaces for studying, either alone or in a group, as displayed by the participants' statements below.

> We were mostly sitting on the grass. This is actually how I spend time with my friends. In fact, I don't have much time, as I have hardly caught up with my courses. I repeated the first year, but I managed to graduate with my friends by working very hard … I had to work for five hours, when a normal person would need to study for just one hour. While at METU I didn't socialize enough. The only thing I used to do was to go swimming in the pool. (User B-4)
>
> I'd like to spend time sitting in quiet places at the back of beyond and read on my computer. The rear of the Department of Economics (outside space) is ideal in that sense. However, it's so hard to go there, although the Alley is not difficult for me. (User B-8)

Participation in social and leisure activities is generally a collective pursuit, but independent participation demands knowing the environment and all of its design-

based features to ensure easy and safe access. It is not enough to fully describe the traces along an unknown travel route, since physical orientation cues and safety measures are generally insufficient, and are not user-needs oriented. In this regard, a more efficient learning process might be achieved through the enhancement of supportive physical design elements that are perceivable by those with visual impairments, and that take into account their safe access. This can lead to the expansion of the behavioral patterns of a circle of users, increasing the personal courage to overcome challenges.

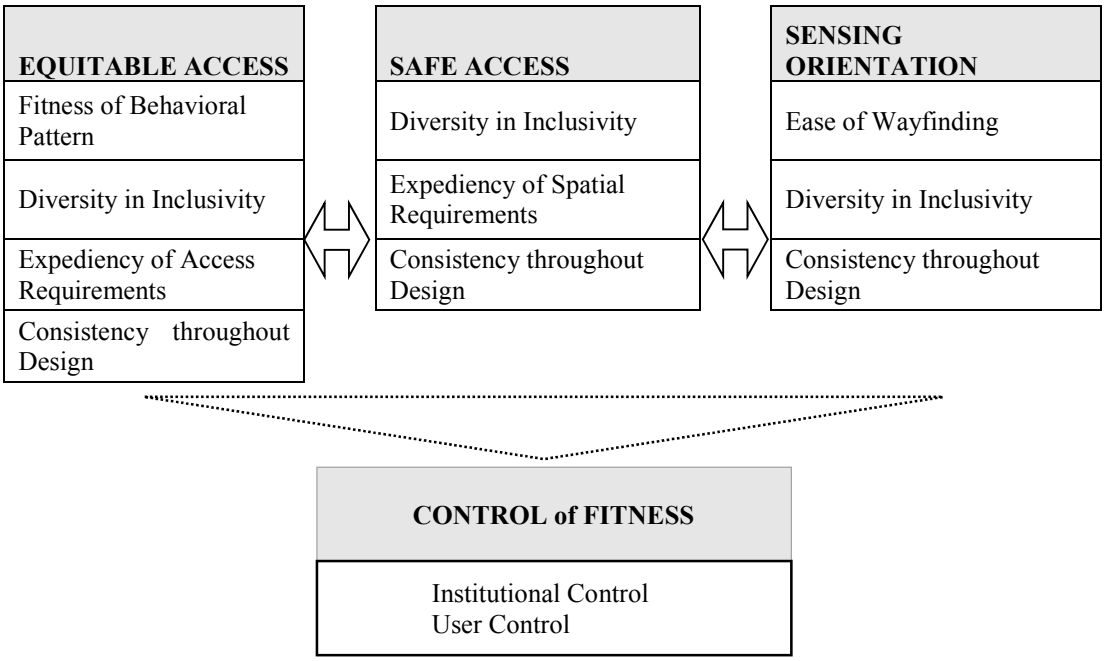
CHAPTER 6

EVALUATION OF THE RESEARCH FINDINGS IN TERMS OF THE PERFORMANCE DIMENSIONS PROPOSED BY KEVIN LYNCH

In this chapter, the performance evaluation design parameters for the equitable access of SWDs in a post-secondary educational environment are developed and their underlying contextual assumptions are explained. This section presents an exploratory study of the key performance indicators necessary for an inclusive campus environment. The overall aim is to draw up an evidence-based qualitative framework for the design of a more inclusive outdoor physical campus environment that satisfies the needs of all users. The contextual basis of this section based mainly on two resources: 1) evidence-based determinations of the spatial factors that influence the success of equitable access of SWDs; and 2) the performance dimensions put forward by Kevin Lynch for the design of a good city. Lynch's performance dimensions, part of the normative theory he proposed for a "Good City", is a valued source in this study for the exploration and scrutiny of the performance evaluation parameters of a campus built environment. On the basis of the right to equal participation in the spatial environment of a higher education facility, this study of the design of a campus built environment for all through the lens of his normative theory appears to have a substantial conceptual relevance. The study makes use of the real user experiences presented in the fifth chapter and Lynch's performance dimensions, forming them into a more reliable framework. Each parameter, along with its sub-dimensions, is explained while linking its probable relations with Lynch's performance dimensions. As displayed in Table 9, even though each parameter and its sub-contexts is presented

as a distinct group, it is significant to note that these characteristics are intertwined, interconnected and dependent on one another through a chain of interrelation assumptions. Having qualitatively interpreted the performance dimension by following those steps, a proposal for quantitative analysis of a campus outdoor environment is put forward and tested to take the proposed contextual framework to an applicable level.

Table 9: Conceptual framework of a performance evaluation and design guidelines for the right to full participation of SWDs in outdoor environments of a higher education campus



Collective Control for inclusiveness is a concept that proposes managing the occupancy process rather than the design process, and is the leading concept in the success of the three proposed parameters of *Equitable Access, Safe Access* and *Sensing Orientation*. These three main performance dimensions are the guiding principles when preparing an accessibility plan for a campus setting from an inclusive perspective, aiming to provide equitable access for SWDs. Assessing the spatial

condition from this well-rounded perspective highlights the equal importance of the physical environment is equally important not only for SWDs, but for all campus users. The means of measuring the level of access may vary according to the analyzed field and the groups in the user population (Lynch, 1981, p. 190). In this study, although the proposed performance evaluation and design index is limited to a particular place and specific user groups, it has a potential to be adopted for any campus setting, without conflicting with the other users' needs.

6.1 Equitable Access

Equitable Access refers primarily to the ability of a campus spatial environment to permit full participation of all campus members, according to which all people, regardless of their level of ability, should be able to easily engage in all phases of access movement, *circulation, approach* and *use* in an independent and equal way. As revealed in the findings of the field study, for each group of participants/users, ensuring these three access activities at the same time and in a manner similar to users without disabilities is a prerequisite for equal access of all commonly shared campus spaces. A spatial environment that permits these interrelated actions on an equal basis would increase social interaction by advancing the full participation of SWDs in university-sponsored events. Physical diversity is very much linked to social diversity, in that the more contacts a person has with the physical environment, the greater their level of social as well as physical involvement. In this sense, *Equitable Access* can best be defined as a multidimensional spatial measurement that is essential for the right to equally participation in a public space. Accordingly, this thesis recognizes the *Equitable Access* dimension as being based on the close relationship that exists between physical access and social participation in an outdoor campus environment. In this regard, it works as a catalyzer for the inclusiveness of people in a campus community. Based both on the findings of the empirical study and notion of Lynch's

normative theory, Equitable Access can be attained through the success of the four sub-dimensions described below.

6.1.1 Fitness of Behavioral Pattern

Common outdoor campus spaces facilitate interaction among students as places where groups of people can play, eat, watch, socialize and congregate, as explained in detail in Section 2.2. When a design solution permits the participation of SWDs in a space together with their friends, it could give them the sense of being respected and valued. This can have a significant impact on increasing social interaction among all students, with or without disabilities, in a spatial campus environment. The ability to participate in spontaneous meetings or events and to make sudden changes in decisions related to social activities can be attained through the creation of suitable accessible routes into the commonly used pattern. This is based on the concept of full participation in a space, where one is allowed to really live (in) a space, rather than the experience, which refers only to the ability to reach or enter a space. Accordingly, matching a proposed accessible route with a commonly used route in terms of these variables may reveal the number of opportunities available within an individual's activity area.

The distances between spaces in a campus environment are considerably influential in this regard. Since lost time affects the academic success of SWDs in post-secondary learning environments, the time wasted attempting to access commonly used spaces by people with diverse (dis)abilities should be considered, with the aim being to make their access as easy as other students. As proven empirically in the field study, the commonly used pedestrian short-cuts between spaces and buildings can certainly cut down travel times, while also increasing opportunities for social interaction (Figure 40 and 41) and increasing the presence of SWDs in campus life. For instance, participants in wheelchairs were found to have to take longer routes due to the obstacles they encounter in the most commonly used outdoor spaces, and needed assistance when having to navigate steps. In each circumstance, they were faced with *excessive physical*

effort and *time consumption*, limiting their use of outdoor spaces and preventing access to certain parts of the campus settlement.

Depended on the existing campus facilities, design improvements to make distances between spaces more reasonable may be possible by manipulating the layout and working system of the modes of access (e.g. adding or changing the location of a public transport stop, adapting special vehicles to allow the transportation of wheelchairs, or changing a route pattern etc.). Additionally, if the suggested accessible route is very close to the general campus pedestrian layout, constant control of the physical environment becomes more possible under different conditions and at different times. It should be noted also that providing access/egress via commonly circulation paths will provide SWDs with feelings of security in the event of unforeseeable events or disasters, as they know there will always be somebody around who can help them.

Figure 40: Fitness of the accessible route to the commonly used area, METU Campus, Ankara (Source: Dinç Uyaroğlu, 2015)

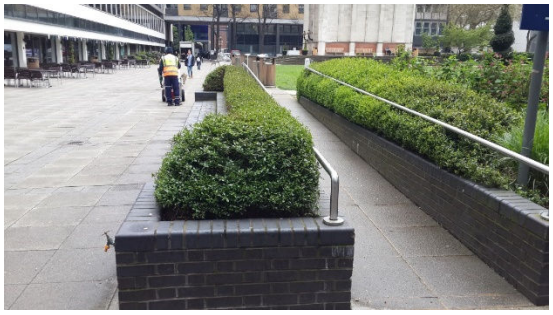


Figure 41: Imperial College, London (Source: Dinç Uyaroğlu, 2014)

6.1.2 Diversity in Inclusivity

The design should appreciate the diversity among people in the light of the modern approach to disability, which is described in Chapter 3 in detail, and in this regard,

design applications need to focus on the heterogeneity of spatial needs, wishes and preferences. The range of experiences, views and needs of the participants in wheelchairs and those with visual impairments of various levels are diverse, like those of the entire community, and while two people may have the same disability type, their needs and desires may differ. Taking this diversity into account, the ideal solution should respond to the most extreme needs of the entire population in an equal manner (Cassim, 2013). For an environment to truly serve all SWDs by providing diverse design measures in an inclusive way, it must allow more individuals to participate independently, make choices, and most importantly, be together with friends.

To accommodate the needs of students with varied (dis)abilities, the overall design and the individual components should be brought together in a holistic and congruous manner. Focus needs to be on appropriate anthropometric data as well as user-based design guidelines, rather than only obeying the design codes in a literal manner. The empirical study illustrates that the literal application of the minimum demands of the design standards does not necessarily remove barriers to the full participation of SWDs in campus life. The central goal is to identify a key solution that leads to collective use through location-specific solutions. The types and features of a design solution determine whether or not it permits collective use. Interpreting the design standards rather than implementing them through a copy-paste approach can lead to design solutions that are in harmony with the form of spatial environment and general behavioral pattern of the campus.

Participants/users with wheelchairs tend to be marginalized due to inappropriate interfaces between different ground levels. For instance, their experiences reveal that the ramp shown in Figure 40, which was designed to be in harmony with the form and size of the general pedestrian network, certainly allows collective use, and so results in the overall satisfaction of all users. It should be mentioned here that its success can also be attributed to the fit of the activity route. To achieve the overall goal of inclusion in a campus environment, an inclusive approach should be taken to satisfying the

different usage demands across the general circulation route. This is related closely to the first sub-dimension of Equitable Access, *Fitness*. In a similar manner, designing of walkways and sidewalks wide enough to accommodate a person in wheelchair and his/her friend walking alongside supports joint navigation around the campus, promoting emotional support. In conclusion, collective use encourages both physical and social diversity, allowing each individual to feel valued in the campus environment (Figure 42, 43, and 44).

The field study reveals that providing a variety of accessible public transport options for both on-campus and off-campus travel can satisfy the various demands of campus users when distances make walking unrealistic. For Lynch (1981), modifications to the design of modes of access can be a significant step towards the goal of full usage of the environment by all community members. Increasing the variety of access means would serve to increase access quality, although providing the optimum modal mix in the general circulation network is the key to achieving the best person-environment fit (Lynch, 1981, p. 191). In this regard, providing a variety of accessible transport means and ensuring convenient transit stop locations, allowing access to spaces and buildings in an interconnecting way, are essential for the provision of independent movement regardless of the time of day or weather conditions. Such support services may include para-transit, public transport, senior minibus services, taxi vouchers, medical minibuses and ride share programs.

Access varies according to the time of day, week or year, and can be affected by unforeseen events, not only for people with disabilities, but for all. In other words, the degree of equal participation may change as a result of a number of factors. It is important to provide free access to commonly used spaces in which students can experience academic, leisure, cultural, recreational, sport and health related activities, not just in the day, but also in the evening/at night (Figure 45). To illustrate, students attending evening classes must be able to reach their classrooms or the library is a necessary activity, as part of their right to education. Similarly, seasonal variations

should also be taken into account, with accessibility measures put in place to allow movement in, for example, rain and snow.

Figure 42: The riverside promenade linking to the upper level in an inclusive way, in front of the Tate Modern, London (Source: Dinç Uyaroğlu, 2014)

Figure 43: Inclusive Access to the independently V&A Museum, London (Source: Dinç Uyaroğlu, 2014)

Figure 44: An inclusive pathway, Jubilee Gardens, London (Source: Dinç Uyaroğlu, 2014)

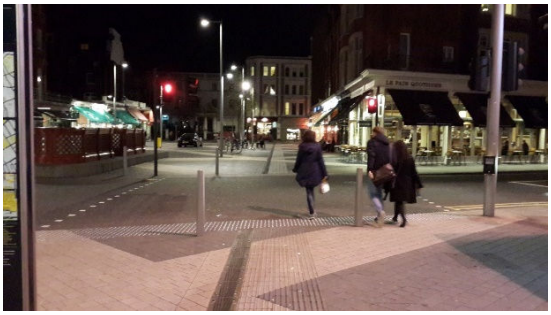


Figure 45: Accessibility measures for diverse spatial needs regardless of the time of day or weather conditions, London (Source: Dinç Uyaroğlu, 2014)

6.1.3 Expediency of Access Requirements

For Lynch (1981, p. 191), "*Access is not simply a quality to be maximized ... to have everything instantly available is no more desirable than it would be to live in an*

infinitely adaptable world". Ensuring the optimum rather than the maximum level of access to spaces is desirable in order to put its distribution on an equal basis (Lynch, 1981, p. 203), for which Lynch suggests a balance of design measures. Referring the Lynch's ideas, enhancing access for people with diverse (dis)abilities to each part of physical environment by responding to a wide variety of spatial needs at the same time and in a similar way is difficult, or maybe even impossible. What is important here is that full access can be achieved by ensuring equal opportunities in the independent and free access to diverse public spaces in which varied and common facilities serve all community members. Accordingly, balancing the design criteria raises the value of the diversity of design solutions to an optimum level of balance and harmony. An accessible environment should mean more than merely accessing classrooms, as it should rather guarantee students free access to all public areas for social interaction, as well as academic ones. Based on these ideas, providing access to all students allows them to benefit from all post-secondary educational opportunities in the most modest way possible, as the main scope of the *Expediency of Access Requirements*.

The endeavor to make each space or spatial equipment accessible to everybody can bring excess and complexity to the design, with the result that travel can become unsafe, uncomfortable and difficult for SWDs. As stated in the field study, the space required for wheeled mobility and for the access of participants with visual impairments can overlap in some conditions, but may also be in conflict. Many of the participants highlighted this conflicting situation, citing the specific example of the yellow perceptible ground surface materials built into the sidewalks in the city. These may cause problems for some users if height levels are excessive or if the materials used are not technically suitable, becoming slippery in the rain. As an example of an overlapping situation, drop curbs allow people with visual impairments to identify the location of pedestrian crossings, while at the same time allowing wheelchair users to cross the road without discomfort (Figure 46, Figure 47). Having knowledge of such conflicting and overlapping situations is essential for decreasing spatial complexity,

leading to the avoidance of contradictions, and ambiguous and uncertain circumstances for all users.

Figure 46: Expediency of diverse design measures at a crossing, South Kensington, London (Source: Dinç Uyaroğlu, 2014)

Figure 47: Changing level of the sidewalk, serving both those with visual impairments and those in wheelchairs, South Kensington, London (Source: Dinç Uyaroğlu, 2014)

6.1.4 Consistency throughout Design

Consistency throughout design addresses the ability of the spatial component to respond to the needs of diverse user in a *harmonious* and *continuous* way across all campus spaces. Providing equitable access for SWDs to outdoor campus spaces requires consistency in the design applications, and is as important as the compatibility and suitability of them to their needs. Suitable and guaranteed access through design requires the design to be properly and correctly applied in an appropriate form at the right place, following a similar model of design throughout the campus. This demands that best architectural practices be implemented in *continuity*.

Providing *continuity of access* is a *sine qua non* in guaranteeing access to spaces, services and facilities in a university campus environment. Connectivity across all parts of the route is a central concern when creating an effective continuity of access, with success depending on the consistent realization of a hierarchical system of spatial

behavior. This was clearly apparent in the study participants' access experiences of the METU Campus, and highlighted the ability of the environment to make the users reach, enter and use space. 'Real' accessibility can be said to have been achieved when these three action can be experienced on an equal basis. Although there are many examples of successful ways in which accessibility improvements are being implemented on campus, leaving behind one handicap in such categorical actions can make all the good design efforts meaningless.

This continuity should be provided considering all means of access in conjunction with access to the proposed services that may vary according to the physical size of any campus setting. Access modes refers to all public transport forms (railway, metro, tram, monorail, bus, *dolmuş* [privately run mini buses], etc.), taxis, special transportation vehicles, and in particular, pedestrian access.[18] By addressing the optimum modal mix among access modes, Lynch (1981, p. 191, 203) highlights the continuation of a travel network in an integrated approach while making various types of measures more responsive to diverse users, being "the provision of new channels and modes, the rearrangements of origin and destination, the abolition of physical barriers". The third topic related to the total removal of spatial barriers is one of the main concerns of the *Equitable Access* performance dimension. To make campus spaces fully accessible for all users, it is essential that spaces are well connected to *paths of circulation,* referring to the delivery of new access modes and the relocations of origin and destination. This could increase the courage and confidence of users to travel independently in the campus, and can have a psychological impact the boosts their presence in the commonly used spaces of a campus.

[18] There are also visual and aural modes of access, as declared by Lynch (1981, p. 191) that are also important themes, especially for people with physical, visual and hearing disabilities in travelling within the built environment. Since visual and aural modes of access are closely related to one's sensing of the space, they are explained in detail in the context of the third performance criterion, *Sensing Orientation*.

Deciding on an appropriate form for an environmental component that allows equitable use by all is the task of the designer. Within a design process, the national design codes should be seen only as a guiding document in the creation of an inclusive campus environment. Such design standards stipulate technical design specifications while presenting partial spatial arrangements for the access of people with impairments, however the participants' experiences show that a literal adoption of the design standards in a cut/paste way will not lead to a consistent or inclusive design solution. In the case of ramp design, for instance, the regulations specify the slope of the ramp, handrail heights, etc., but the form of the ramp should change according to the area in which it will be applied.

In the example of METU, applications for the accessibility and mobility of SWDs are based on the standard-based knowledge of personal spatial needs, and are addressed on a case-by-case basis rather than as part of a unified approach. Design standards are not always useful for all, but may be applied to solely obey the rules, as can be understood from the experiences of the participants. Students with visual impairments, especially those who use a cane, state that there is a need for the embossed yellow paving applications stated in the codes in large areas where there are no reference points (tracing with the boundaries, changes to the ground surface finishing), but emphasize that if the sidewalk is properly designed (i.e. appropriate height, wide, curb cuts, free of protruding objects along its boundaries, measures indication the line of crossings, etc.), they would not need such non-stop perceivable paving applications. Figure 46 shows an example of a different but perceivable inclusive curb-cut application. The lack of consistency in a design approach is a very important challenge that should be taken into consideration in Turkey, not only in a university setting, but across the entire city scale. What is needed in the end is an interpretation of the national design codes that responds to diverse needs in a unified, inclusive and consistent manner. From this perspective, the best architectural solutions can be achieved by developing a design process that involves criticism from all users, with or without disabilities.

As described in the findings of the empirical study, a lack of consistency and therefore continuity in commonly used pedestrian circulation routes results in lost time for SWDs, as those who are obstructed must find other means of access. This continuity should be sustained taking into account seasonal, daily and hourly changes in circumstances. Besides, in times of disasters, such as fire, it is vital that the outdoor and indoor spatial environment allows the rapid escape of people with diverse disabilities (e.g. people with mobility and visual disabilities, aged, overweight or obese, pregnant as well as those in wheelchairs). In considering the timely egress from a setting, the design of stairs and elevators merits particular attention.

6.2 Safe Access

Safe Access refers access without anxiety related to undue hazards and risks to life and health. Lynch defines *Safety* as a sub-parameter of Vitality, being highly important in guaranteeing the survival of human beings. In this respect, a physical environment should eliminate or control any hazards that may threaten any community member, and so the attributes of all parts of the spatial environment, including steps, doors, rooms and inclines, should be well suited to the basic biological structure of the human body (Lynch, 1981, p. 122). If design of the built environment is lacking in this regard, it may cause accidents that may be fatal under certain conditions, as indicated in the empirical research. To eliminate such risks and to take the necessary precautions, the design should be legible for all user groups. The below design dimensions aim to advance the legibility of safety in a campus outdoor spatial environment.

6.2.1 Diversity in Inclusivity

To achieve *Safe Access* for all, inclusive design solutions that satisfy diverse safety needs and are clear of contradictions, are essential within the environment. Designing a spatial environment that provides perceptible information to suit the requirements of

all users is important in the provision of safe access. In the context of this study, visual, auditory and sensory means of transferring information are deemed necessary to keep users informed about potential hazards in a space. Aside from guiding daily life activities, as mentioned in detail in the context of the third dimension *Sensing Orientation*, *Safe Access* demands design measures that warn or prevent unexpected and sudden accidents. Herein, inclusive design measures should be applied that provide a sense of safety to all.

Today, access to information for people with disabilities has been advanced by virtue of the perpetual development of assistive devices. In this respect, the White Cane is one of the oldest, but most significant inventions for the blind or visually impaired, allowing their safe navigation of the built environment. Similarly, a wheelchair allows people with severe mobility impairments to move around independently. These are among the most widely used and known devices, although others exist that help convert auditory signs into information for the hard of hearing or deaf. For the effective functioning and benefit of assistive devices, in other words, to provide access to information, physical campus environments are required to have advanced to a level that allows the full participation of SWDs in a post-secondary learning environment.

In the context of this sub-dimension, the design of ground finishings can be highlighted as a primary issue to be taken into consideration. Slippery surfaces, vertical or horizontal obstacles, and intended architectural elements on a pedestrian way can result in different levels of risk for each group of SWDs, and even for those without impairment. Additionally, different forms and colors of surface finishings to inform of level differences, for instance, deserves particular attention, allowing people, especially those with visual impairments, to easily identify spaces, read signs, and distinguish stairs and their combination with a ramp. In this sense, visual and auditory means of passing on information, perceived by different senses as indicators of danger, should be put in place.

The proposed design evaluation framework is created to measure the safety of outdoor public campus spaces by assessing time- and weather-specific variations. It takes into account considerations of how safe SWDs feel in the outdoor environment at different times of the day. Neither group of participants in the field study made frequent independent use of outdoor spaces or buildings, since design elements such as lighting and material choices in the built environment were commonly considered problematic at night, as the lack of light meant there was not enough contrast between elements as a visible and legible cue. The existence of surveillance measures for the convenience of spatial use under different weather conditions makes the users feel safer, comfortable and more willing to engage in independent movement in outdoor spaces. In the event of unforeseeable disasters, a vital performance requirement is to ensure a means of egress is maintained for all users under any situation, regardless of their ability. Within this concern, *Safe Access* also refers to the vital importance of the well-being of the users.

6.2.2 Expediency of Spatial Requirements

For Lynch (1981, p. 121), a good settlement is one in which hazards and incidents are absent or controlled, and where a fear of encountering them is low. Lynch accepts that it is impossible to remove all risks that exist in a physical environment, but claims that decreasing the level of risk can be possible. Lynch claims that: “We look for reasonable levels of risk, not a total absence of it” (Lynch, 1981, p. 123), and in this sense, Lynch (1981) refers to the *tolerability* of a place when describing the creation of good public life to the greatest extent possible.

There is always a risk of hazard in a physical campus environment; however, the most important step in decreasing hazardous situations is the application of essential *design measures to minimize hazards to a reasonable level*, at any time and under any condition. Participants/ users sometimes came across contradictions between physical access and safety when experiencing one element of the environment. For example,

for the participants with severe sight loss, curved or inclined stairs leading to a department building, while providing a significant level of orientation guidance, may also lead to possible accidents. Herein, balancing the design aspects to decrease the level of risk to a reasonable level takes prominence. Furthermore, mechanical components such as elevators could not be used efficiently by the participants, being sometimes out of service, lacking usage information, involving long waiting times and preventing collective use. In this regard, in outdoor space design, the designer should give weight to more structural, stable and long-lasting design elements rather than those with mechanical parts, as much as possible. All of these spatial attributes can lead to the creation of a spatial environment that is *tolerant to experiencing for all* as much as possible.

Reconsidering the planned travel network pattern of a campus based on the access modes of the users may also contribute to advancing the tolerable level of spatial use. In the case of METU, for instance, if public transport stops are not located in a safe place for access/egress and for the crossing of pedestrians, decisions to relocate such stops can have an effect on the security of pedestrians and traffic alike. Any efforts to enhance the spatial environment to an equitable level can promote the independent movement of SWDs, even around unknown areas.

6.2.3 Consistency of Design

An uninterrupted perceptibility and visual clarity of the route layout, regardless of the conditions, is important in the creation of a continuously safe outdoor campus environment (Figure 48, Figure 49), and so the features of the pedestrian system are of primary importance. The design approach is central to the route layout, and should include careful design measures related to the slopes, surfaces, width and edges of the pathway to protect people with disabilities from hazards. The falls and slips of SWDs can generally be attributed to a lack of these *formal qualities of the route layout*. As the empirical findings of this study clearly show, the *boundaries* of the route layout,

being the points where changes occur in grade and texture, and in vertical or horizontal surface finishes (i.e. walls, ceilings and floors) are where particular attention should be paid during the design process.

In places where the spatial boundaries are unclear, the participants/users are often subjected to unsafe and uncomfortable travel, limiting their inclusion and engagement within the campus. The boundaries of vertical or horizontal elements represent the most crucial risk, especially for people with visual impairments, since they tend to use such boundaries for wayfinding. Protruding branches, and stairs and ramps without edge protection are some hazards that should be eliminated for the creation of an inclusive outdoor campus environment in this regard. The applied design measures and the experienced boundaries should be consistent and continuous across the whole campus. Continuous surveillance by way of an institutional monitoring mechanism can guarantee its realization, and this can inform SWDs of any alterations or modifications made to the environment, and thus facilitates and advances their presence in the commonly used campus spaces.

Figure 48: An uninterrupted perceptibility and visual clarity of the route layout enhances safe access in the environment (Source:http://www.ite.org/css/online/DWUT10.html)

Figure 49: An example of the visually and physical continuous pedestrian route which values safe access (Source: http://www.ite.org/css/online/DWUT10.html)

Time, as one of the variables affecting the efficiency of spatial use by SWDs is a concern of the *Continuity* parameter. The use of space at day or night, in winter or spring are important issues that should be taken into consideration when taking measures for safety in an uninterrupted way. The continuous illumination of commonly used spaces should be well organized not only for SWDs, but for all users. This empirical study shows that a well-lit spatial environment would provide users with limited vision or those in wheelchairs with feelings of safety, and thus can facilitate the use of such spaces. In the context of the time variable, seasonal changes also affect the use of a built environment. Slippery floor finishings due to rain or frost in the winter can be a hazard when disconnecting a series of safety design measures. In a similar manner, a hole along the pedestrian route on a rainy day may be a risk for people with limited vision.

Providing continuous safe access has also a psychological dimension. For Lynch (1981), visible and non-isolated spaces that provide some degree of visual and physical connection to other spaces, activities, and thereby people, create a sense of security from an emotional aspect. In this respect, the fitness of an activity route with a commonly used route that encourages a constant density of people and post-secondary activities can invoke feelings of safety in SWDs. For them, this is more important at times when an individual needs help from someone, for any reason.

6.3 Sensing Orientation

The design of a built environment is of particular importance in terms of the freedom of communication provided to people with disabilities with public life, which is indeed an important issue of justice (Lynch, 1981, p. 228). In this respect, *Sensing Orientation* can be viewed as an essential means of encouraging strong communication between a person and their environment. Lynch's statement, "Good orientation enhances access and good opportunity" (Lynch, 1981, p. 134) outlines explicitly its contribution to

equality of access. The achievement of in-between communication necessitates understanding all of the essential information (to be) presented in the environment. Having sufficient information makes environments easy to be used by everyone, and makes the users feel confident enough to access a space. Lynch addresses the context of *legibility* when describing the perfect degree of communication through symbolic physical features (1981, p. 139). For the realization of a legible campus setting for the benefit of SWDs, three important design parameters, explained below, should be considered.

6.3.1 Ease of Wayfinding

Lynch refers the sense of how parts of the spatial environment are connected to each other and the sense of knowing where (or when) one is based on the definition of *formal structure,* which is one of the elements of *Sense* in Lynch's normative theory. From this perspective, he defines *orientation* as a process involving a memory of the act of navigation, which indicates a remembered series of sequential images, and results in a more or less structured mental map (Lynch, 1981, p. 134). Accordingly, *Ease of Wayfinding* is central to a clear circulation system, by "*making understandable street patterns, heightening the identity of streets and destination, making intersections intelligible, or creating vivid spatial sequences along some important path*" (Lynch, 1981, p. 146). The visual and physical connection from one area to another and the visual or sensorial perception of existing landmarks in continuity promotes easy orientation and wayfinding by enabling the individual to locate his or her position in relation to the rest of the site. This, in turn, makes orientation easier with the formation of a mental map of the site. A lack of continuity in orientation cues, as proven empirically by the field study, can cause poor *orientation, which means lost time and wasted effort, especially for people with disabilities (*Lynch, 1981, p. 134). Ultimately, they may develop a reluctance to access spaces in the event of a discontinuity of wayfinding information in the campus.

Obtaining legible and perceptible information from surrounding landmarks is an important component for *Ease of Wayfinding,* which involves the explicit usage of a campus circulation pattern as well as warnings of possible hazards. For the participants with wheelchairs, Ease of Wayfinding is possible through the legibility of the accessibility solutions, and depends on the presence of an understandable circulation route layout, open to all, and an enhancement of orientation measures in continuity. Signage can also be effective for reading the environment, although it should be noted that signage should fit to the accessible circulation route. If there is a lack of continuity in the accessibility design applications, a proposed signage system can be meaningless, or vice versa. In this regard, both the design of outdoor spaces and the provision of a signage system that is well-suited to behavior patterns should be taken into consideration when aiming for the equal use of commonly used campus spaces for those in wheelchairs, among others. The issue has similar value but a different application for the participants with visual impairments. Obviously, guidepaths are crucial for people with visual disabilities, however they generally constrain the user a linear axis. Users with visual impairments want to experience more routes freely, especially within a network of commonly used pedestrian areas where many post-secondary events are hosted. Where necessary spatial attributes exist, the blind participants and those with visual impairment were able to utilize that commonly used spaces of the campus independently and easily, without the need of guidepaths. These qualities depend on the success of landmarks that are experienced during the process of walking. Not only the built parts of the environment but also natural features such as trees, flowers and water are useful landmarks, offering opportunities for uninterrupted orientation through movement. These should be considered as part of a holistic approach to the identification of architectural solutions.

As observed while walking through the campus with SWDs, A good sidewalk design and walking path deserves important attention. At crossing points and changes in direction in particular, the design should direct users at the right place and time, without confusion and complexity. In this regard, changes of direction should follow

the general pedestrian flow, and movement through such linkage points should be assisted through appropriate design principles involving tactile and color contrasts. For students with visual impairments, an indication should be provided related to the hierarchy of paths at these points (Christophersen and Denizou, 2011, p. 42.6). In Figure 50, a change in direction is outlined by a square, with the main route represented by a double raised line and the secondary route by a single line.

Due to lack of vital landmarks in the METU Campus, and in the city in general (Dinç Uyaroğlu, 2008), people with visual disabilities tend to use boundaries for wayfinding, and education for independent access is based on the utilization of natural or artificial boundaries of the spatial elements (Dinç Uyaroğlu, 2008). Navigation by following spatial boundaries through narrow pathways (i.e. sidewalks) can be noted as an equal means of usage; however, in large pedestrian areas, such an approach cannot ensure the utilization of that space on an equal basis with others. In the case study area, the usage of the Alley is a good example of this, to some degree, as a wide pedestrian axis that is enhanced by linear guides on the ground that are used by the participants for wayfinding. Having embraced such holistic architectural solutions, it is essential that the method of education for independent access is changed.

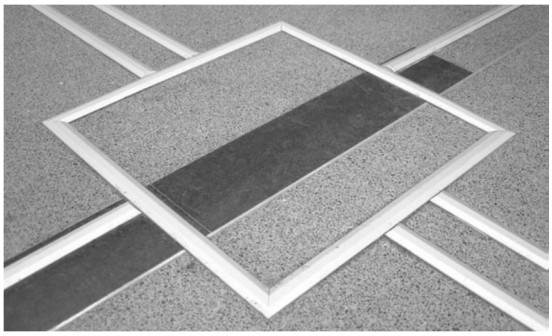


Figure 50: An intersection of two guidepaths at the University of Agder, Norway. (Source: Christophersen and Denizou, 2011, p. 42.6, Photo: Wibeke Knudsen)

Figure 51:, Imperial College, London (Source: Dinç Uyaroğlu, 2014)

6.3.2 Diversity in Inclusivity

Sensing orientation in a campus setting depends on the collective achievement of both the design attributes of spaces and an appropriate signage system that includes written, visual and verbal information to guide SWDs. This study has been established upon the relationship between these means of communication and the perceptions of the sample users.

Lynch emphasizes that effects of *formal structure* during sensing orientation in a place. The formal structure of the environment refers to the ability of people to sense a spatial environment from the appropriateness of its parts, by which one can get to know his/her position in a spatial environment and its relationship with the near surroundings (Lynch, 1981, p. 134). In the context of this thesis, the formal qualities of access routes in-between or within spaces are an important part of the formal structure. Access routes should include a variety of ways to help navigate users through the space, which can be through sight, hearing, touch or smell, depending on individual abilities/disabilities (Figure 51). In short, it should be perceptible through different senses.

Design applications to satisfy the needs of wheelchair users are based on forming/designing the form of the circulation route between or within spaces. Plain, smooth, non-slip and non-reflective ground surfaces are the most effective surfaces for people with disabilities, and for the population as a whole. Rough surfaces, high friction materials such as cobbles and paved areas with complicated layouts, colors or materials have the potential to lead to unsteadiness and disorientation for all.

The participants with visual impairments were able to make use of surrounding landmarks by means of touch, smell and hearing. As declared by the participants with visual impairments, they follow vertical or horizontal boundaries as navigation lines to walk a straight line, and streets are straight, or curved or angled, contributing to the definition of the space, which has an impact on the reading of the spatial layout for

wayfinding (Figure 52, Figure 53). This is important also for wheelchair users, but for safety rather than orientation. Most people with severe sight loss have partial vision, which can be useful in wayfinding if the design has the ability to be perceived. The participants with total sight loss need to obtain information about the surrounding area from all useful landmarks, directions or indications, as stated by one participant, “I have to use all kinds of marks, otherwise there is no way for me to access.” For instance, the ability to perceive surface finishings of different textures or level differences, voices and flows of people, sounds of pools along the Alley, the sound of cash registers at a supermarket, the smell of food from a restaurant, or the odor of a tree, flowers or a waste bin, all serve as indicators for wayfinding for the participants with total sight loss. It should be mentioned here that things that are static and permanent serve as significant and reliable reference markings for wayfinding. In short, it can be said that the provision of various design solutions in an inclusive manner allows everyone to be accommodated in terms of access, safety or orientation.

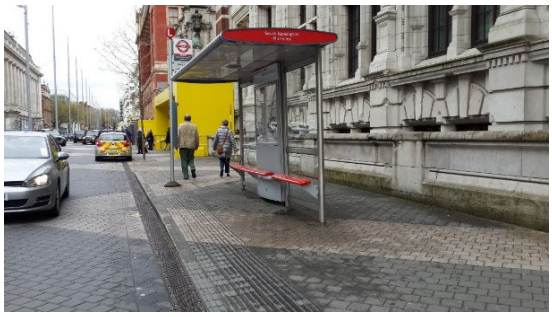


Figure 52: Exhibition Road, London (Source: Dinç Uyaroğlu, 2014)

Figure 53: Ground surface covering on Exhibition Road, London (Source: Dinç Uyaroğlu, 2014)

The empirical study reveals that if the outdoor environment responds to the multiple senses of individuals, in particular those with sight loss, it can offer ease of navigation and can encourage their independent movement. From this aspect, the fitness of their used route into the general circulation pattern plays a role in advancing the legibility

of spaces, especially for people with visual disabilities. Herein, the quality of the design in terms of how it enhances equality dictates its full achievement. For Lynch (1981, p. 132), within the Sense dimension of good city form, the mental maps of individuals are not only created by their "sense of place", but also by the "sense of occasion", which refers to social activities and events in a city. A pedestrian circulation system that is in common use by an entire campus community involves a flow of people that fits into the general spatial layout, and perceiving a flow of people using different senses is also used for orientation towards spaces, especially for students with visual impairments.

Figure 54: A textural variety of coverings on the ground can be used as a guidance tool and makes orientation easier for the participants who use a white stick. METU Campus, Ankara (Source: Dinç Uyaroğlu, 2015)

Participants with severe vision loss and the totally blind travel around the campus with the help of spatial depictions of the circulation routes. Spatial Depiction for blindness refers to a serial description of a route or location based on the variety of surrounding and stable orientation cues, such as level differences, slopes and sounds, which people with visual impairments may benefit from in independent travel. In this way, they are informed about turning points to desired locations as a means of wayfinding. A type of floor tile with different tactile, audible and visual features should be considered at such points. To illustrate, setting the tile apart from the surrounding floor surface allows users with sight loss and a cane to use it for navigation (Figure 54). Herein, the

overall success of such an approach depends on the comprehension of the cognitive mapping of the area.

There are many electronic devices that can help with navigation through an environment that generally adopt GPS technologies, and can be operated through a normal mobile phone or other devices. As stated by the participants, such devices do not always give detailed and correct information in a timely manner, and so guidance through design is absolutely necessary. Christophersen and Denizou (2011, p. 42.8) stress that a successful combination of guidepaths and electronic guidance systems would be an innovative and beneficial solution in this sense.

Figure 55: Formal qualities of the ground surface directs people along the route (Source:http://www.ite.org/css/online/DWUT10.html)

Figure 56: Accessible map in a public square, London (Source: Dinç Uyaroğlu)

Combined with the spatial form (Figure 55), signs and maps (Figure 56, 57, and 58) are some of the devices that can increase the level of available information and make the environment more understandable (Lynch, 1981, p. 147). In this regard, signage is an important component of wayfinding. It should be noted here that full success can only be realized when the spatial design itself directs people along a primary circulation path that lead to various destinations. The role of wayfinding signage, in this sense, is mainly to support and develop independent wayfinding for SWDs, and

an institution can also provide other devices, tools and information to direct SWDs within a campus in an independent and equal manner. As the empirical findings show, presenting the potential use of the environment to users with wheelchairs and visual impairments, especially newcomers, by way of a *campus accessibility map* is essential for their easy and timely access through campus spaces. For Lynch, a *time-distance map* is one way of representing and measuring access, which can be achieved by analyzing the quantities of any type of feature that is accessible from a particular point, and informing of access opportunities, distances and estimations of journey times (Lynch, 1981, p. 201, 203). In the context of this study, the participants, especially those in wheelchairs, should take a central position in terms of their access to spaces in a reasonable time, since they have less mobility than their counterparts with no disabilities. Taking this into account, an accessibility map containing time-distance information would have an important impact on easy orientation, and as such, inclusion. Accordingly, a university should provide accessible and easily understandable maps that guide students with diverse disabilities around the campus in an efficient way, covering both indoor and outdoor environments. The map example shown in Figure 56 is an accessible source, directing wheelchair users and people with visual disabilities, as well as the able bodied, day or night, in the public sphere. Within a large setting like the METU Campus, providing such maps of the most commonly used outdoor spaces in separate parts can be a good solution.

Variations in the time of day and weather based on seasonal factors have an impact on sensing orientation. Spaces serving necessary activities in particular should be sufficiently illuminated at night in order to allow all users, particularly the partially sighted and those in wheelchairs, to travel in a secure and easy way. A lack of illumination can bring considerable problems to the partially sighted, as in limited light they are unable to identify contrasts in colors. Spatial environments need to be clearly identifiable during both day and night. To sustain continuity in orientation, especially at night, adequate lighting throughout the general circulation pattern is a prerequisite. The level of sensing orientation varies considerably depending on changes in weather

conditions. For example, snowy weather negatively affects the utilization of the campus outdoor environment unless suitable measures are not taken.

Figure 57: Campus Accessibility Map presented in the campus outdoor, Imperial College, London (Source: Dinç Uyaroğlu, 2014)

Figure 58: Signage in the campus outdoor, Imperial College, London (Source: Dinç Uyaroğlu, 2014)

6.3.3 Consistency throughout Design

Forming a new mental concept is difficult for new users, just as orientation and finding new routes is hard in a less familiar environment. All of the participants mentioned spatial challenges when navigating the campus and how they store information about where buildings are located to assist in their navigation when they arrive. Realizing spatial adequacy can make users gain a clear understanding of the entire outdoor environment, allowing them to navigate comfortably in the outdoor setting, which was more important for the participants with sight loss.

A person with visual impairment engages with the consistent, static and reliable landmarks found within a space to perceive the space, and consequently, to navigate within it. As mentioned above, landmarks advance the legibility of the space when they are created correctly and statically. The features and siting of landmarks are important for the perception of a space, and consequently for orientation. It was observed that the type and location of landmarks have an impact on equality in access through the general circulation route on campus. An appropriate positioning and locating of various types of landmarks and their uninterrupted integration throughout campus should be consistently secured, as this will allow the spatial environment to be legible in a timeless manner. This contributes to guaranteeing access without hesitation, while also supporting the cognitive mapping of students with partial or total visual impairment.

For the access of visually-impaired users, it may be beneficial to limit orientation to guidepaths, especially in a university campus with a dynamic social scene. Changes in the form of the ground, considering vertical and horizontal boundaries, and other environmental landmarks are required, while contrasting colors on the ground can also be meaningful, especially when marking level differences and existing elements, or when a ramp may not be too visible. Guidepaths are needed at key locations and junctions when users have difficulties in wayfinding, and tactile ground surfaces are an acceptable solution in this sense. Studying new design methods particular to a place to promote easy and equitable navigation in a space beyond code compliance is important, and consistency among such methods should be constantly ensured. For instance, a marking particular to the needs of users with visual impairments should be standardized to have the same meaning across the entire campus. This standardization needs to be achieved in a subtle way. On the other hand, landmarks that are unique and memorable, and perceivable through various senses, can be of benefit not only to people with visual impairments, but for the entire population, and can increase opportunities for discovery, resulting in an increased presence in campus spaces.

6.4 Control of Fitness

Within the context of this study, referring Lynch's normative framework (1981), control refers to the ability of the community to use and modify a place, and to have a right to decide how it is advanced, thus gaining ownership over it and attaching meaning to it. *Control* is the shared responsibility of the entire institution, and in this sense, it operates at two main levels, being at an institutional level and user level. Previous studies have suggested that SWDs are academically successful in college due mainly to the provided institutional support and the positive attitude of the faculty and their peers. Strong collaboration between the administrative body that holds the power to regulate and enforce policies and the users of the institution who are affected by its practices is required to ensure positive social change. It is obvious that an impact-response relationship exists between these two groups, and the notion of this collaborative approach is taken from 'democratic campus life'.

6.4.1 Institutional Control

Institutional Control is related closely to the accessibility strategy dictating how design principles of inclusion can be collectively realized by the whole university entity. For the success of an accessibility strategy aimed at inclusion, the initial issue that should be addressed is the mentality of the institution in both attitude and application. It is quite clear from the empirical findings that when the way of design thinking in parallel with the institution's mentality goes beyond mere compliance, and is based rather on indigenous architectural solutions, the physical environment becomes more welcoming to all. In this sense, the university should maintain a mission that goes beyond obeying the codes, norms or other legislative rules particular to special groups of users, being instead based on addressing 'how the environment welcomes all of its users in an equal manner'. Additionally, since it should act as an advocate for the inclusion of the disabled population in society, while deciding upon the design of

inclusive spaces, it is essential to go beyond following the legal requirements. This is its informal but requisite role in turning the built environment into one that is inclusive.

Creating an inclusive campus is not an easy endeavor, but if the university follows a systematic method in accessibility management, such a goal can be achieved with great success. Both the design and the long-lasting control of spatial behavior can help to eliminate all architectural handicaps, and so managing/controlling accessibility is a prerequisite for a well-(re)designed campus outdoor environment. The primary obstacle to be overcome it the lack of a comprehensive plan or programming. For Lynch, such resources guide the management and design and of a plan, encouraging a constant analysis of the place to see the level of performance of the built environment (Lynch, 1981, p. 161). A comprehensive and holistic design evaluation procedure is both the basis and an integral part of planning process, either when designing a new campus setting or adapting an old one. It is a linking part of the cyclic relationship among the key planning phases of evaluation, design and action, being an essential systematic analysis of the spatial environment to garner efficient, comprehensive and reliable information on post or previous occupancy feedback.

A holistic and comprehensive accessibility evaluation of a university's physical setting should begin with feasibility studies to identify current activity-based behaviors, and to clarify possible routes for equal access to commonly used spaces. In its creation, everyone's rhythm of campus life should be integrated into the standard rhythm to overcome isolation problems (Lynch, 1981, p. 190). Based on the fit between spatial characteristics and user behaviors, secondly, comprehensive data on the accessibility condition of the campus should be obtained by focusing on collective needs rather than piecemeal individual needs. This control mechanism should take into account all spatial scales, from macro (e.g. changing the location of a bus station) to micro (e.g. controlling the working of the elevator), and different potential times of use. To illustrate, as the participants of the study noted, the timely clearing of snow is vital for the independent mobility of students in wheelchairs and those with visual impairments.

Control addresses mainly the monitoring, manipulating and, ultimately, enforcement of the architectural codes related to the accessibility of the spatial environment. It is a prerequisite for the creation of an inclusive outdoor campus environment, but cannot be limited to those design specifications. As Lynch (1981) claims, in the nature of a normative idea, situational variability means that the codes in any legislations are changeable according to local characteristics, attributes and preferences.

The university is responsible for continuously seeking out the needs, preferences and interests of all community members, and for providing responsive architectural solutions. This feedback mechanism can contribute to the formation of an interactive line of communication between the users and executive body, and in turn, certifies the institution's openness to communication. Through such a close interactive communication process, an institution is kept informed about at what level the students are free to access its educational physical environment; in other words, at what level it presents an "equal right of access" to them. The findings of the field study reveal that spatial modifications with further empirical validation are essential if students with disabilities are to be provided with equal opportunities with regard to access in a university campus. In this regard, it is important to evaluate all needs collectively, and this study asserts that to achieve this, architectural researchers and professionals should consult the entire body of campus users, without separation of SWDs, to reveal at what level the architects' intentions and the perceptions of the users are in compliance.

While controlling the environment, keeping good aspects that were not applied specifically for accessibility is also important, as was made apparent in the comments of the participants, especially those with severe visual disabilities. For instance, the participants with visual impairments use the immovable steel grate that was installed in front of the Library building nearly 20 years ago (in reference to one participant) as a major orientation cue when looking for the entrance platform to the building. A university is a life-long institution with which students maintain a relationship, despite

having graduated a long time ago. In this regard, sustaining such positive attributes of the physical environment is an important part of the institutional control process.

It can be concluded from the empirical study that although obstacles exist in the physical environment that are criticized mostly by users with disabilities, they want to come to the campus even after graduation, given the feelings of comfort and confidence and the positive attitudes they feel there when compared to other parts of the city. The positive support of the institutional body, staff, instructors, students and all other users of the campus community towards SWDs helps to raise their self-esteem and confidence. The institution's sensitivity towards and understanding of the needs of SWDs creates a feeling of living in a democratic campus life.

6.4.2 User Control

Designing in line with accessibility design standards, principles or parameters alone does not ensure the success of an inclusive campus outdoor environment, rather it is crucial to understand whether campus spaces are usable by SWDs to an equal degree. To deeply comprehend the usability of a space it is necessary to consult the user, as discussed in depth in Chapter 3. Lynch, in his normative theory, highlights that the active engagement of individuals in (re)shaping the environment is needed for the democratic participation process (Lynch, 1981). The continuity of any human society depends on the good control of its living spaces (Lynch, 1981, p. 220). It is obvious that an activist power is required for the realization of physical, and thereby, social change for democratic participation, especially in terms of accessibility applications in such developing countries as Turkey. From these aspects, the ability, power and freedom of SWDs to change and modify their campus outdoor environments should be ensured to guarantee a livable campus environment for them on an equal basis. For the realization of this, the involvement of individuals in society is a top priority, since it is not possible to comment on spatial quality without taking into account their lived and real spatial experiences. Accordingly, the experiences, evaluations, demands,

complaints, and all other commentaries of SWDs/users about the usage of the campus environment should be a central concern at each phase of the spatial design evaluation. Referring to Lynch's theory, this is a prerequisite for the realization of the *fit* between behaviors and spatial characteristics, leading to a good community campus life.

A campus community, in general, shares the same goal while watching over the environment for the benefits of its groups of users. In this respect, user control does not mean that only disabled students should highlight the missing parts of the built environment. As proven in the field study, the fact that their friends, whether formally or informally, are collectively a part of this process makes them feel more confident, and this is one of the factors that may increase their sense of belonging in the campus. On the other side, this process would make the campus community, in general, more aware and conscious about disability and accessibility. By stating "responsible control is also critical to the development of the individual and of the small group", Lynch (1981, p. 220) claims that the entire whole is trained while participating in the process of control.

Physical design attributes may inhibit or facilitate the participation of SWDs in daily activities of campus life; however, although personal characteristics, desires and interests also influence their participation. This is valid also for their involvement in the decision-making process. Securing the contribution of students to the design and evaluation process depends on the users' willingness, readiness and concerns. As shown in the field study, working to bring about physical and social change as activists can facilitate and advance architectural implementations, especially in places that are still undergoing development, like the METU campus.

The implementation of accessibility design solutions can cause people with disabilities to feel valued, and may encourage them to give feedback about the drawbacks of the environment. Such applications give that message that an institution is concerned about accessibility and is open to communication with the aim of eliminating

obstructive elements in a campus. As proved in the METU case, although accessibility design implementations have been applied quite slowly, the university's openness and sensitivity towards the needs of SWDs may increase the active participation of its community members in the creation of an inclusively designed campus environment. All participants noted in conversation that they had an overall positive attitude in living and using the outdoor spatial campus environment, despite the spatial challenges they experienced. This indicates a strong interactive relationship between the contexts of *institutional control* and *personal control*.

6.5 Campus Accessibility Evaluation Index (CAEI)

A Campus Accessibility Evaluation Index (CAEI) (Table 10) is defined as the *certification* of an outdoor campus environment, showing the level of its achievement in the equitable access of SWDs. The CAEI is based on the three performance dimensions and their sub-dimensions, involving a total of 48 performance design parameters. Some design criteria related to different performance dimensions seem to overlap; however, in appraisals of the spatial environment, each of them is expected to be evaluated in the context of the related performance dimension, being *Equitable Access, Safe Access* and *Sensing Orientation*. The evaluation of each performance design parameter as an individual and independent criteria allows the condition of the analyzed field to be interpreted in terms of the context of each performance dimension. For instance, considering either natural or constructed environmental components in the design warrants different approaches in measuring access, safety and orientation. All dimensions would appear to be qualitative in nature; however, in evaluating each performance parameter, it is also essential to consider the quantitative essentials, that is, the obligatory design standards for outdoor public spaces that are laid out in legislation in Turkey.

Utilizing a statistical *Weighted Arithmetic Mean* method, the performance scores for each performance dimension is evaluated with regards to the target performance level for that specific area. The target performance score is measured against the weighted values and user satisfaction levels, with the weighting values showing the importance level of the design parameters. The weights ascribed to the design parameters are determined as "1" or "2", meaning respectively 'required' and 'must'. The level of importance of the design parameters depends on what is expected from the environment in the creation of equitable access for all community members. To obtain a reliable assessment of the accessibility level of the campus outdoor environment, the importance value of each design measure in its relationship with the performance evaluation parameters is calculated from the data obtained from the subject users, and the experiences of the author as an architect with ten years of experience in disability and accessibility research. Ensuring the users' active engagement in (re)shaping the environment within the process of control is highlighted often in this thesis, and so the users' subjective ratings also form part of the evaluation process for the reliable design evaluation parameters (Table 10). The measures may change according to different user-groups in ranking from '0' to '3' (0: Not at all; 1: Somewhat; 2: Adequate; 3: Very good).

At the end of the assessment, CAEI delivers a single evaluation result along with independent measurements of each performance dimension. A level of performance mean is grouped into three categories, ranging from better design applications to poor ones: A- Inclusive, (70%–100%); B- Tolerable, (40%–70%); and C- Exclusive (0%–40%). An outcome value of between 0 and 40 percent refers to a deprivation of the usage of spaces, causing the exclusion of SWDs. When it is between 40 and 70 percent, the spatial environment is identified as tolerable. Finally, between 70 and 100 percent means the campus environment encourages equitable access for SWDs.

Table 10: Campus Accessibility Evaluation Index (CAEI) for the Equitable Access of SWDs

PERFORMANCE EVALUATION DIMENSIONS	***SUB-DIMENSIONS***	***PERFORMANCE DESIGN PARAMETERS***	**Weighted Values**	**Assessment Method**
EQUITABLE ACCESS	**FITNESS**	The level of fitness in between commonly used pedestrian routes and SWDs spatial behaviors	2	Site observation User assessment
		Designing origins and arrivals of existing access modes (by transportation vehicles) to a certain reasonable level	2	Site observation User assessment
	DIVERSITY	Providing diverse design measures in an inclusive way in responding to the extreme needs of campus users	2	Site observation User assessment
		Suggesting design solutions peculiar to a space through interpretation of design standards rather than their use in a copy-paste approach	2	Site observation
		Allowing for collective usage of commonly used campus outdoor spaces through a general circulation route	2	Site observation User assessment
		Designing all natural and manmade environmental components (i.e. bins, lampposts, trees) in an appropriate form and position	2	Site observation User assessment
		Presenting an optimum modal mix among and in between various access modes (i.e. railway, bus and dolmuş, as well as pedestrian access) in the general circulation network	2	Site observation
		Providing accessible transportation options and convenient transit stop locations in an interconnected way, if needed, through the application of new access modes and the relocations of origins	2	Site observation
		Providing independent access at night to commonly used outdoor spaces in which students may engage in academic, leisure, cultural, recreational, sport and health-related activities	2	Site observation User assessment
		Managing accessibility measures to take into account such seasonal factors as rain and snow	2	Site observation
	EXPEDIENCY	Distribution of access among students in an equal manner to allow them to benefit from all post-secondary services in the most modest way possible	2	Site observation User assessment
		Decreasing spatial complexity in the design to the avoid contradictions, and ambiguous and uncertain circumstances	2	Site observation
		Ensuring a reasonable level of physical effort and distance	1	Site observation User assessment
	CONSISTENCY	Ensuring consistency in the design approach among all accessibility applications	2	Site observation
		Ensuring continuity of access to guarantee independent and equal access to spaces, services and facilities	2	Site observation User assessment
		Realization of a hierarchical system of spatial behaviors in an equal manner – approaching, entering and using – in each commonly used outdoor space	2	Site observation User assessment

Table 10 (Continued)

		Elimination of all environmental barriers along the boundary of walking paths that break continuity, on both sidewalks and other pedestrian routes	2	Site observation
		Ensuring continuity between access modes so as to enable equal usage	2	Site observation
		Making less-used pedestrian circulation routes more tolerant to experimentation in use	1	Site observation
SAFE ACCESS	**DIVERSITY**	Resolving unevenness, slippery surfaces and instability of all ground levels	2	Site observation User assessment
		Eliminating vertical and horizontal protruding elements and other potential trip hazards within the boundary of the pedestrian way	2	Site observation
		Informing about level differences through different forms and colors of the surface finishing	2	Site observation
		Providing visual and auditory means of imparting information, perceived by different senses as danger warnings where necessary	2	Site observation User assessment
		Providing sufficient lighting and appropriate material choices within the built environment to make spaces clearly legible at night	2	Site observation User assessment
		Providing continuity of access in different weather conditions through existing surveillance measures	2	Site observation
		Ensuring easy evacuation, guaranteeing the well-being of all users in the event of unforeseeable disasters	2	Site observation
	EXPEDIENCY	Providing a balance between design applications for physical access and safety so as to minimize hazards to a reasonable level at all times, and under any conditions	2	Site observation User assessment
		Planning transportation facilities (i.e. relocation of bus stops) based on current access modes of the users to improve safety	2	Site observation User assessment
	CONSISTENCY	Uninterrupted perceptibility and visual clarity of the route layout, regardless of time of day or weather conditions	2	Site observation User assessment
		Guaranteeing formal qualities of the route layout – slope, surface, width and edge of the pathway	2	Site observation User assessment
		Taking essential measures at points where there are changes in the position of spatial components, vertical and horizontal surface finishes throughout campus	2	Site observation
		Providing a continuous well-lit spatial environment	2	Site observation
		Ensuring users gain a feeling of safety	1	Site observation User assessment
SENSING ORIENTATION	**EASE OF WAYFINDING**	Making the circulation route layout easily understandable	1	Site observation User assessment
		Ensuring the visual and sensorial perception of existing spatial landmarks in continuity	2	Site observation User assessment
		Directing users to the right place in time without confusion and complexity, especially crossing points and changes of direction	2	Site observation User assessment
		Providing a perceptible signage system	2	Site observation

Table 10 (Continued)

	Integrating measures related to natural environmental elements such as trees, flowers and water into the design as useful landmarks for uninterrupted orientation	1	Site observation User assessment
DIVERSITY	Ensuring a variety of wayfinding information, perceivable by the multiple senses of individuals: sight, hearing, touch and smell	2	Site observation User assessment
	Providing static and permanent wayfinding design attributes as a reliable reference for wayfinding	2	Site observation
	Providing plain, smooth, non-slip and non-reflective ground surfaces	2	Site observation User assessment
	Achieving a fit between spatial design attributes and perceptible and appropriate signage systems that include a set of written visual, and verbal information	1	Site observation User assessment
	Presenting the potential use of the environment through a campus accessibility map for the easy and timely access of all	1	Site observation
	Providing adequate lighting across the general circulation pattern	2	Site observation User assessment
	Taking surveillance measures in the event of changes in weather conditions	2	Site observation
CONSISTENCY	Ensuring the appropriate position and location of various types of landmarks in a consistent way	2	Site observation User assessment
	Designing the form of the ground as the central role in wayfinding, beyond only working on linear guidance through a perceptible guidepath for users with visual impairment	2	Site observation
	Ensuring the standardization of orientation design measures across all parts of the environment	2	Site observation

6.5.1 Application of CAEI

The selected area for the testing of the CAEI is located at the center of the METU campus, and the heart of campus life. It includes frequently used outdoor spaces and commonly used buildings, including the library, departmental buildings in which many of the participants of this study are educated and a 'ternary amphitheater' for common lectures, panels, film presentations and other events, where all campus members are invited to participate in academic, politic, social, artistic and cultural activities.Figure 59 and 60 present a detailed analysis of the existing condition of the site, having been based on the results of the observations of the author and the

participants of the study, garnered during in-depth interviews and a participative observation process that involved travelling the site together, as described in section 5.3. It is a finding of the empirical research that they can, on the whole, travel independently within this site, although they experience some difficulties, especially when navigating towards the building entrances. As described in detail in section 5.4, some shortfalls in the spatial attributes of this area of the campus exist, although they are within tolerable levels. This indicates that while SWDs access is being provided, it is not yet equitable. The result of the created index matches this finding of the empirical study.

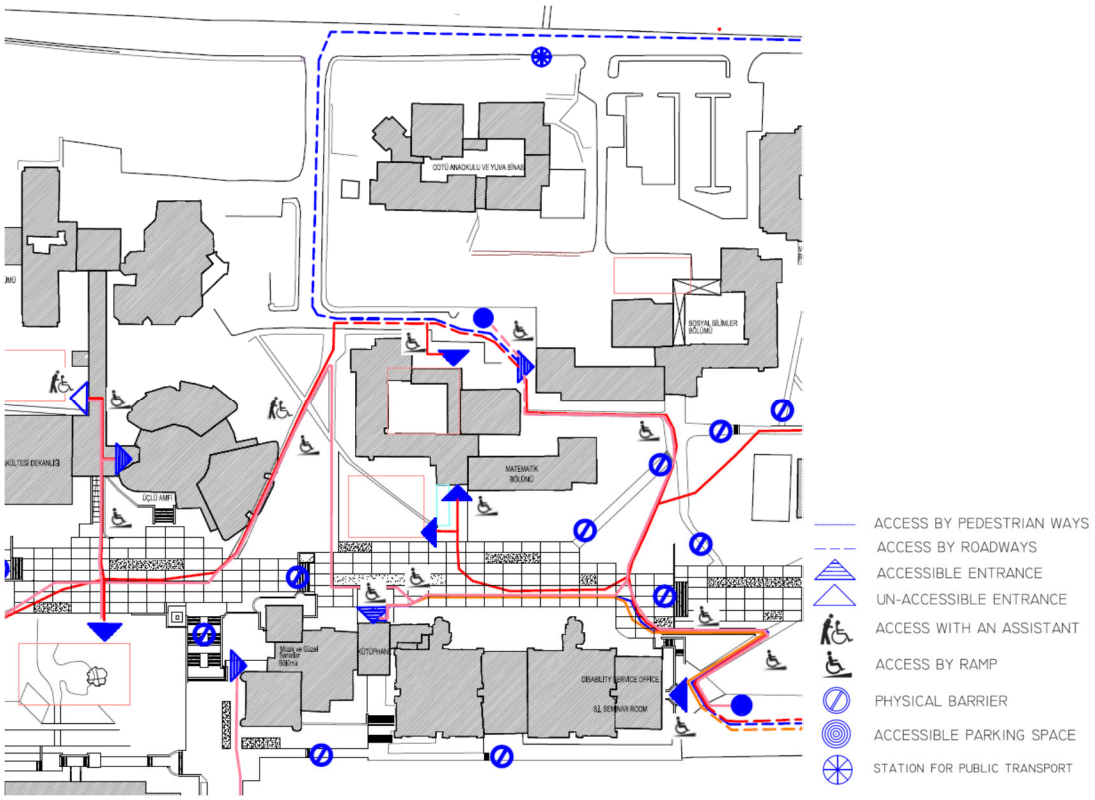


Figure 59: Appraisal of the site based on the assessments of the participants with wheelchairs

In inserting the data into the index, the assessments of each group of participants are recorded separately (Table 11), and the average rankings of their assessments are calculated, with a sum score calculated for each performance design parameter from the weighted values and the average rankings in the participants' assessments. From the weighted arithmetic means of the sum scores, it can be seen that the level of Equitable Access of the site is 50.93 percent; Safe Access is 64.20 percent; and Sensing Orientation is 56.41 percent. The average degree of accessibility is 56.55 percent, which falls within the limit of *B-Tolerable (40%–70%)*.

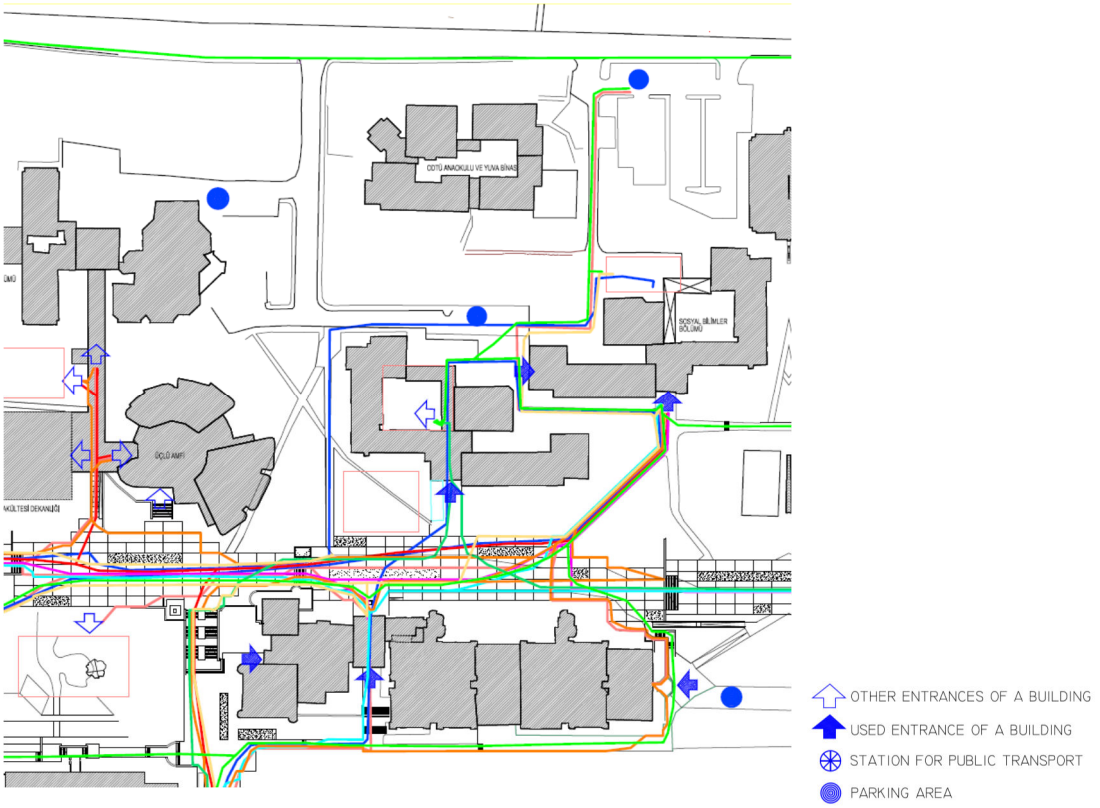


Figure 60: Appraisal of the site based on the assessments of the participants with visual impairment

Table 11: Evaluation results of the site using CAEI

PERFORMANCE DIMENSIONS	Weighted Values	Assessment Method	Ranking (User group A)	Ranking (User group B)	Average Ranking	Sum score	
EQUITABLE ACCESS							
Fitness							
The level of fitness between commonly used pedestrian routes and the spatial behavior of SWDs	2	Site observation User assessment	2	3	2.5	5 (2.5*2)	6
Designing origins and arrivals of existing access modes (by transportation vehicles) to a certain reasonable level	2	Site observation User assessment	1	2	1.5	3 (1.5*2)	6
Diversity							
Incorporating diverse design measures in an inclusive way in response to the extreme needs of campus users	2	Site observation User assessment	1	2	1.5	3 (1.5*2)	6
Suggesting design solutions peculiar to a space through an interpretation of design standards rather than using them in a copy-paste approach	2	Site observation	2	2	2	4 (2*2)	6
Enhancing collective usage of commonly used campus outdoor spaces through a general circulation route	2	Site observation User Assessment	1	2	1.5	3 (1.5*2)	6
Designing all natural and manmade environmental components (i.e. bins, lampposts, trees) in an appropriate form and position	2	Site observation User Assessment	3	2	2.5	5 (2.5*2)	6
Presenting optimum modal mix among and between various access modes (i.e. railway, bus, dolmuş, as well as pedestrian access) in the general circulation network	2	Site observation	1	2	1.5	3 (1.5*2)	6
Providing accessible transportation options and convenient transit stop locations in an interconnected way, if needed, with the delivery of new access modes and the relocation of origins	2	Site observation	1	2	1.5	3 (1.5*2)	6
Providing independent access at night to commonly used outdoor spaces in which students may engage in academic, leisure, cultural, recreational, sport and health-related activities	2	Site observation User Assessment	0	1	0.5	1 (0.5*2)	6
Managing accessibility measures taking into account seasonal factors such as rain and snow	2	Site observation	0	1	0.5	1 (0.5*2)	6
Expediency							
Distribution of access among students in an equal manner to allow them to benefit from all post-secondary services in the most modest way possible	2	Site observation User assessment	1	2	1.5	3 (2*1.5)	6
Reducing spatial complexity in design for the avoidance of contradictions, and ambiguous and uncertain circumstances	2	Site observation	2	1	1.5	3 (1.5*2)	6

Table 11 (Continued)

Ensuring a reasonable level of physical effort and distance	1	Site observation User assessment	2	3	2.5	2.5 (2.5*1)	3
Consistency							
Ensuring consistency of the design approach in all accessibility applications	2	Site observation	1	1	1	2 (2*1)	6
Ensuring continuity of access to guarantee independent and equal means of access to spaces, services and facilities	2	Site observation User assessment	2	2	2	4 (2*2)	6
Realization of a hierarchical system of spatial behavior in an equal manner – approaching, entering and using – in each commonly used outdoor space	2	Site observation User assessment	1	2	1.5	3 (1.5*2)	6
Elimination of all environmental barriers along the boundary of walking routes that break continuity, either on the sidewalk or on other pedestrian ways	2	Site observation	2	1	1.5	3 (1.5*2)	6
Ensuring continuity between access modes in a way that provides equal usage	2	Site observation	1	2	1.5	3 (1.5*2)	6
Making less-used pedestrian circulation routes more tolerant to experimentation in use	1	Site observation	0	1	0.5	0.5 (0.5*1)	3
Cumulative score	36					55	108
Total cumulative score of EQUITABLE ACCESS (Out of 100)						55/108= **50,93 %**	
SAFE ACCESS							
Diversity							
Addressing unevenness, slippery surfaces and instability of all ground levels	2	Site observation User assessment	2	2	2	4 (2*2)	6
Eliminating vertical and horizontal protruding elements and other potential trip hazards within the boundary of the pedestrian way	2	Site observation	2	2	2	4 (2*2)	6
Informing about level differences through different forms and colors of ground surface finishings	2	Site observation	3	2	2.5	5 (2.5*2)	6
Providing information via visual and auditory means, to be perceived by different senses warnings where necessary	2	Site observation User assessment	1	1	1	2 (2*1)	6
Ensuring sufficient lighting and appropriate material choices for the built environment to make spaces clearly legible at night	2	Site observation User assessment	1	0	0.5	1 (0.5*2)	6
Providing continuity of access under different weather conditions through existing surveillance measures	2	Site observation	0	1	0.5	1 (0.5*2)	6
Ensuring easy evacuation to guarantee the well-being of all users in the event of unforeseeable disasters	2	Site observation	1	2	1.5	3 (1.5*2)	6

Table 11 (Continued)

Expediency							
Providing a balance between design applications for physical access and safety so as to minimize hazards to a reasonable level at all times, and under any conditions	2	Site observation User assessment	2	3	2.5	5 (2.5*2)	6
Planning transportation facilities (i.e. relocation of bus stops) based on current access modes of the users to increase the level of safety	2	Site observation User assessment	3	3	3	6 (3*2)	6
Consistency							
Uninterrupted perceptibility and visual clarity of the route layout, regardless of time of day or weather conditions	2	Site observation User assessment	3	2	2.5	5 (2.5*2)	6
Guaranteeing formal qualities of the route layout – slope, surface, width and pathway edge	2	Site observation User assessment	2	3	2.5	5 (2.5*2)	6
Taking essential measures at points where there are changes in position of spatial components, and vertical and horizontal surface finishes throughout the campus	2	Site observation	2	1	1.5	3 (1.5*2)	6
Ensuring a continuously well-lit spatial environment	2	Site observation	2	1	1.5	3 (1.5*2)	6
Ensuring users gain a feeling of safety	1	Site observation User assessment	2	3	2.5	5 (2.5*2)	6
Cumulative score						52	81
Total cumulative score of SAFE ACCESS					52/81	**64.20 %**	
SENSING ORIENTATION							
Ease of Wayfinding							
Making circulation route layout easily understandable	1	Site observation User assess.	2	1	1.5	3 (1.5*2)	3
Enhancing visual and sensorial perception of existing spatial landmarks in continuity	2	Site observation User assessment	3	3	3	6 (3*3)	6
Directing users to the right place in a timely manner, without confusion or complexity, especially at crossing points and changes of direction	2	Site observation User assessment	1	1	1	2 (2*1)	6
Providing a perceptible signage system	2	Site observation	1	0	0.5	1 (0.5*2)	6
Integrating measures relating to natural environmental elements such as trees, flowers and water into the design as useful landmarks for uninterrupted orientation	1	Site observation User assessment	3	3	3	3	3
Diversity							
Providing a variety of wayfinding information, perceptible by the multiple senses of individuals – sight, hearing, touch and smell	2	Site observation User assessment	3	3	3	6 (3*2)	6

Table 11 (Continued)

Providing static and permanent wayfinding design attributes for reliable reference in wayfinding	2	Site observation	3	2	2.5	5 (2.5*2)	6
Providing plain, smooth, non-slip and non-reflective ground surface	2	Site observation User assessment	2	2	2	2 (2*1)	6
Achieving a fit between spatial design attributes and a perceptible and appropriate signage system that includes a combination of written, visual and verbal information	1	Site observation User assessment	2	2	2	2 (2*1)	3
Presenting the potential use of the environment through a campus accessibility map for easy and timely access for all	1	Site observation	0	0	0	0 (0*1)	3
Ensuring adequate lighting throughout the general circulation pattern	2	Site observation User assessment	1	1	1	2 (1*2)	6
Taking surveillance measures when weather conditions change	2	Site observation	1	1	1	2 (1*2)	6
Consistency							
Ensuring appropriate positioning and location of various types of landmarks in a consistent way	2	Site observation User assessment	2	2	2	2 (2*1)	6
Designing form of the ground as the central marker in wayfinding, beyond only working on linear guidance through a perceptible guidepath for users with visual impairment	2	Site observation	-	3	3	6 (3*2)	6
Ensuring standardization of orientation design measures throughout all parts of the environment	2	Site observation	1	1	1	2 (1*2)	6
Cumulative score						44	78
Total cumulative score of SENSING ORIENTATION					44/78	**56.41 %**	
Average accessibility degree (out of 100)						**56.55 %**	

CHAPTER 7

CONCLUSION

Accessibility is an indispensable tool in the creation of social integration, which in turn supports the inclusion of students with disabilities (SWD) in the full spectrum of university campus life. Accessibility of a university campus has technical, social and psychological dimensions based on the notion of full person-environment fit. In this respect, when the degree of accessibility is enough to ensure equal opportunities for SWDs, the promotion and development of 'active citizenship' and 'democratic participation' in a campus community will be realized. This thesis attempts to answer the question, *"How should the outdoor spatial environment of a campus be (re)designed in order to achieve inclusivity for university SWDs?*" Providing inclusivity for all on university campuses necessitates a holistic approach with strategic campus planning, calling for a comprehensive and systematic design and evaluation of an existing outdoor campus environment, or guiding design parameters in the case of a new campus plan. This study puts forward a performance evaluation and design method to be applied either for the improvement of the existing condition of a spatial campus environment or during the design of a new campus settlement. To this end, a Lynchean normative theorization is taken as the basis of the contextual reference.

The performance dimensions proposed by Kevin Lynch for a 'Good City Form' (1981) have been developed by perennial empirical studies, all of which are grounded principally on cognitive aspects and psychological dimensions, and contribute to the creation of constructional mental maps that are formed visually in the physical

environment. In theorizing on the basis of two meta-criteria, *Efficiency* and *Justice,* Lynch created a more influential and universal framework related to the human rights issue, the normative criteria of which we still retain today as essential for the creation of the architectural environments that best take into account human rights. As such, although nearly three decades have passed, Lynch's Normative Theory is still being cited in architecture and city planning literature. Furthermore, Lynch's theoretical basis has also been referenced in the field of Environmental Psychology, while in this thesis, emphasis is shifted from good city life to the human rights issue in the field of architecture.

Combining Lynchean Normative Theory with the conducted empirical study helped to forge a powerful relationship between the SWDs and their educational spaces in the creation of a good campus settlement. Proposing a conceptual framework and its means of application in the form of the Campus Accessibility Evaluation Index (CAEI), the study advocates an inclusive approach to the planning, implementation and management of spatial campus environment, in which the dimensions serve as a source of reference and guidance for designers, universities and governments. The suggested evaluation dimensions have a qualitative aspect, with the in-depth understanding of the users' spatial experiences through empirical study being the most favorable facet of the approach. It should be stressed here that further research should be undertaken, and that all universities should examine their own situation according to these design guidelines. This study concludes by arguing that the proposed performance design and evaluation guidelines are essential if such educational facilities are to go beyond the removal of barriers in the planning of campus spaces by comprehending the use and perception of the outdoor environment by SWDs on an equal basis.

Disability is conceptualized differently by different cultures (Preiser, 2011, p. 38.3), and since design approaches are affected by such factors, accessibility applications differ from country to country. In Turkey, and valid also for METU, mainstream

thinking still disregards the spatial needs of people with disabilities in the built environment. Design applications that are based on the visitability of an area indicate a lack of understanding of full participation, and thereby foster the social inclusion of individuals in society. As a result of this indifference, accessibility in a university campus is generally limited to classroom access, and sometimes not even that. The existing accessibility evaluation framework that is dictated by national legislation is based on a figurative match between the design specification and parts of the spatial environment. Although accessibility is pursued in a right-based approach in legislation, the actual implementations tend to lack such sensitivity. To improve the current situation to the greatest extent possible, this study presents a framework that can be applied nationwide, focusing on the values of local culture through the help of an empirical research. The proposed Campus Accessibility Evaluation Index (CAEI) is expected to guide design implementations to eliminate crucial barriers as much as possible, targeting a truly equal educational environment for all that holds the equitable access of SWDs as a priority.

It is essential that all of the spatial concerns of SWDs are respectfully recognized in the design and evaluation stages of a plan, being integral to the mainstream development of inclusive campus planning, as this would increase the reliability of the design evaluation dimensions. As a result of a lack of attention to spatial needs, user feedback on the usage of the design is generally missing, and consequently, very little is actually known about the views and wide-ranging experiences of SWDs on the use of special and novel design solutions. Dialogue between people with disabilities and researchers in a reflexive manner can bring reliable knowledge to the design process for all. Addressing this relationship between man and his environment, this study takes social factors into account in conjunction with technical design specifications.

The conducted empirical study was limited to a geographically defined sample area in the METU campus, and the findings of the study are derived from the personal experiences of those who use this university community. The study involved not only

interviews with SWDs, but also travels with them through the campus environment, which contributed a great deal to the veritable elaboration of the dimensions in the study. The study was conducted with two groups of students with disabilities: students who use wheelchairs; and students with severe visual impairment. It can be understood that providing diverse design solutions that respond to the extreme spatial needs of individuals in an inclusive way will work for the benefit of everyone at the same time. In this sense, it is argued in this thesis that comprehending the spatial experiences of these two user groups will lead to the fulfilment of the goal of this study, since they are part of the population with extreme needs in the community. That said, it should be noted here that disabilities can take many different forms, and so facilitating the full participation of SWDs in the campus community through planning requires an understanding of the different types of impairments and the associated needs, preferences and desires of individuals. The characteristics of the performance dimensions for the creation of a good city, in Lynch's view, should be as general as possible to respond to the particular features of form (Lynch, 1981). Referring to this view, this study refrains from making such generalizations, focusing instead on the limited experiences of two specific user population groups in a particular environment.

METU's social meaning is based on its culture of campus life, and is supported by the architectural and planning quality of campus spaces. The METU campus has unique attributes in terms of its design quality, being permeable due to its perfect planning layout, which makes moving around the outdoor campus spaces relatively easy and safe for all users, including SWDs. The sloping terrain is the only feature of the campus that could cause access problems for people with mobility impairments. The built environments and facilities on campus are all different in nature, so the situation differs case by case. Similar studies carried out in different settings can lead to the emergence of other design aspects, since different campuses may have different special attributes in terms of function, size and context. The behavior patterns of the users and the characteristics of each campus setting should be considered separately, but in an integrated way, as this will contribute to identifying possible inclusive routes for all

sorts of appropriate usage patterns of students with diverse disabilities. Additional research can broaden the understanding of this topic by taking into account various demographic or geographic contexts.

Fitting accessibility design solutions into the spatial form can also contribute to the advancement of the aesthetic qualities of the environment in some instances, although the proposed performance dimensions do not take into account the notion of architectural aesthetics. The issue of architectural aesthetics in the design of accessibility solutions is an extensive field that warrants comprehensive study. Furthermore, when aiming to modify the spatial environment of an old university settings like the METU campus, the aesthetic harmony of the accessibility design measures with the campus environment should also be dwelt upon from a conservationist perspective.

The contribution of this dissertation to architectural literature is branded within two aspects. First, it proposes a new contextual framework by following, criticizing and interpreting universal architectural and planning theories within a local context, suggesting that an in-depth look at a local sample will broaden architectural theories. Second, the thesis raises arguments that aim to close the gap between normative and theoretical design parameters and architectural practice, highlighting that priority should be given to efforts to bridge this gap. To this end, it steers the proposed normative value-laden design principles towards the adoption of a tool that is manageable in practice nationwide. Achieving the full inclusion of SWDs in a university campus requires more than merely a technical fit. The to-the-letter application of design standards is not enough for the creation of an inclusive spatial environment, since accessibility planning and the formation of detailed solutions are particular to each individual spatial environment. Designers should try out new materials and architectural solutions that take into account the features of the specific spatial environment, rather than relying only on ready-made products and design

standards. In this regard, the outcome of this study presents both theoretical and practical insights.

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APPENDIX A

NATIONAL ACCESSIBILITY PERFORMANCE MEASUREMENT MODEL

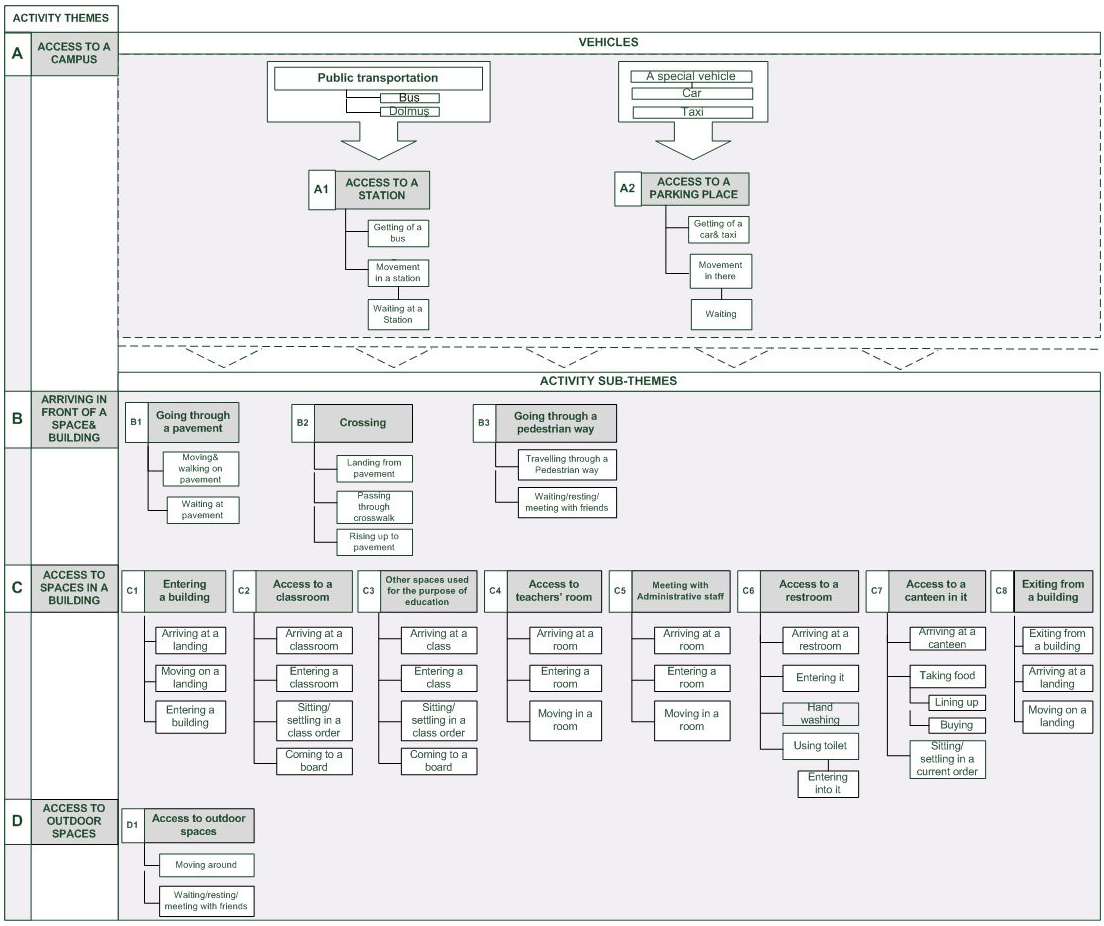


Figure 61: The First Step: Conceptual modelling of the evaluation tool: componential analysis of post-secondary common activities

									PERFORMANCE PARAMETERS			
ACTIVITY	SUB-ACTIVITIES	ELEMENTS of BUILT ENVIRONMENT	ELEMENTS of BUILT ENVIRONMENT	ATTRIBUTES of BUILT ENVIRONMENT ELEMENTS	requisite standard	reference question	DESIGN STANDARDS	DESIGN STANDARDS-Min. Requirements	SAFETY 1-5	ACCESS1-5	SENSE ORIENTATION 1-5	PERFORMANCE VALUES (0, 1, 2)
YAYA GÜZERGAHINDA HAREKET (DIŞ MEKAN)	YAYA GÜZERGAHINA ERİŞİM	YAYA GÜZERGAHI		Seviye farkı			Kaldırımdan/otoparktan vb... yaya güzergahına geçiş noktasında 0,6 cm'den fazla kot farkı var mı?	EVET				
								HAYIR				
						evet ise	Kot farkı kaç cm'dir?	A) 0,6cm -1,3 cm				
								B) 1,3 cm-15 cm				
								C) > 15 cm				
							Kot farkı hangi yöntemle çözümlenmiştir?	Rampa				
								Merdiven				
								Asansör				
			RAMPA		*	A	Yaya kaldırımında yürüyüş güzergahındaki kot farkının 0,6 cm- 1,3 cm olduğu yer en fazla 1/2 (% 50) eğimle pahlanmış mıdır?	EVET				
								HAYIR				
					*	B	Yaya kaldırımında yürüyüş güzergahındaki kot farkının 1,3- 15 cm olduğu yerde rampa var mıdır?	EVET				
								HAYIR				
				Genişlik	*	B (evet ise)	Rampanın genişliği en az 100 cm midir?	EVET				
								HAYIR				
				Eğim	*	B	Rampanın eğimi en fazla 1/20 (% 5) midir?	EVET				
								HAYIR				
				Manevra alanı	*	B	Rampanın başlangıç ve bitiminde tekerlekli sandalyenin manevra yapabileceği en az 150 cm x 150 cm'lik alan var mıdır?	EVET				
								HAYIR				
				Yüzey kaplaması	*	B	Rampa yüzeyi düz, sabit, dayanıklı ve ıslak-kuru halde kaygan olmayan malzeme ile kaplanmış mıdır? (Sorudaki tüm özellikler sağlanıyorsa evet cevabı verilmelidir.)	EVET				
								HAYIR				
					*	C	Yaya kaldırımında yürüyüş güzergahındaki kot farkının 15 cm'den fazla olduğu yerlerde rampa var mıdır?	EVET				
								HAYIR				
					*	C	Yaya kaldırımında yürüyüş güzergahındaki 15 cm'den fazla kot farkının rampa ile çözümlen(e)mediği durumlarda çalışır durumda olan alternatif erişilebilir erişim sistemi kullanılmış mıdır? (Evet ise seçiniz)	Platform asansörü				
								Hidrolik asansör				
				Genişlik	*	C (RG)	Rampanın genişliği kaç cm midir?	1) < 100 cm				
								2) > 300 cm				
				Eğim	*	C	Rampanın eğimi en fazla 1/20 (% 5) midir?	EVET				
								HAYIR				
				Manevra alanı	*	C	Rampanın başlangıç ve bitiminde tekerlekli sandalyenin manevra yapabileceği en az 150 cm x 150 cm'lik alan var mıdır?	EVET				
								HAYIR				
				Yüzey kaplaması	*	C	Rampa yüzeyi düz, sabit, dayanıklı ve ıslak-kuru halde kaygan olmayan malzeme ile kaplanmış mıdır? (Sorudaki tüm özellikler sağlanıyorsa evet cevabı verilmelidir.)	EVET				
								HAYIR				
				Uyarıcı yüzey	*	C	Rampanın başlangıcının 30 cm öncesinde ve bitiminden 30 cm sonrasında 60 cm derinliğinde uyarıcı yüzey bulunmakta mıdır?	EVET				
								HAYIR				
				Uzunluk		C	Rampanın uzunluğu kaç m'dir?	1) < 2, 00 m				
								2) 2,00- 10,00 m				
								3) > 10, 00 m				
				Dinlenme alanı	*	C-3	Rampa 10 m'den uzun ise 10 m.de bir en az 150cm x150 cm'lik düz dinlenme alanı var mıdır?	EVET				
								HAYIR				
				Dinlenme alanı	*	C-3	10 m'de bir sahanlıklarla bölünen 30 m'den fazla uzunluğu bulunan rampa var ise 30 m'de bir 2,5 m'lik dinlenme alanları var mıdır ve bu alanlarda geçişi engellemeyecek şekilde bank yerleştirilmiş midir?	EVET				
								HAYIR				
				Bilgilendirme			Yürüyüş güzergahında açıkça görülemeyen rampalar var mıdır?					
					*		Yürüyüş güzergahından açıkça görülemeyen rampalara tabela ile yönlendirme yapılmış mıdır?	EVET				
								HAYIR				
			Trabzan			KF> 15 cm C-2,3	Rampanın durumu nasıldır?	A) iki tarafı boşluk				
								B) tek tarafı boşluk				
								C) iki tarafı kapalı				
					*	A, B	Her iki tarafı boşluk olan rampanın her iki tarafında, boşluk tek tarafta ise boşluk olan tarafta trabzan var mıdır?	EVET				
								HAYIR				
				Küpeşte	*	A,B,C	Küpeşte rampanın her iki tarafında var mıdır?	A) İKİ TARAFTA				
								B) TEK TARAFTA				
								C) YOKTUR				

Figure 62: The Second Step: Physical Modelling- A Part of the data of the Model: Movement through a pedestrian pathway

									PERFORMANCE PARAMETERS			
ACTIVITY	SUB-ACTIVITIES	ELEMENTS of BUILT ENVIRONMENT	ATTRIBUTES of BUILT ENVIRONMENT ELEMENTS		requisite standard	referance question	DESIGN STANDARDS	DESIGN STANDARDS- Min. Requirements	SAFETY 1-5	ACCESS 1-5	SENSE ORIENTATION 1-5	PERFORMANCE VALUES (0, 1, 2)
KALDIRIMDA HAREKET	KALDIRIMDA İLERLEMEK	KALDIRIM			*		Taşıt yolunun kenarında yaya kaldırımı var mıdır? (Taşıt yolundan güvenlik önlemleriyle ayrılarak yayanın hareket edebileceği yaya yürüyüş alanı kaldırım olarak değerlendirilecektir.)	EVET				
								HAYIR				
					*		Yaya kaldırımı taşıt yolunun her iki tarafında var mıdır?	EVET				
								HAYIR				
					*		Taşıt yolu boyunca yaya kaldırımının sürekliliği devam ediyor mu? (Yol kesişimleri haricinde)	EVET				
								HAYIR				
			Kaldırım çeşidi				Yaya kaldırımının yoğunluğu nedir? (işaretleyiniz)	A) Düşük yoğunluk (Yaya yoğunluğu, d= 0,3 yaya/m2'ye kadar olan, yayaların birbirini geçmesini gerektirmeyen yaya kaldırımıdır.)				
								B) Az yoğunluk (Yaya yoğunluğu, d= 0,3-0,6 yaya/m2 olan ve yayaların herhangi bir hızda, normal adımlarla, rahat dolaşmasının ve birbirlerini rahat geçmesinin sağlandığı yaya kaldırımlarıdır.)				
								C) Orta yoğunluk (Yaya yoğunluğu, d= 0,6-1,0 yaya/m2 olan, gidiş gelişlerde yayalar arası hareketlerin, adımların ve birbirini geçmede rahatlığın azaldığı, kesişmelerin çoğaldığı yaya kaldırımlarıdır.)				
								D) Yüksek yoğunluk (Yaya yoğunluğu, d= 1,0-1,5 yaya/m2 olan, spor, sanat, sinema, tiyatro, okul vb. nedeniyle yoğunluğun yüksek olduğu kaldırımlarda, gidiş gelişlerdeki yaya hareketlerinde adımlar sınırlanır, hız düşer, kesişmelere ve sıkışıklık artar, yayalar birbirine sürtünmeden ve çarpmadan yürümekte zorlanır.)				
			Genişlik		*	A	Düşük yoğunluktaki yaya kaldırımında tüm yayaların serbestçe hareket edebilmeleri için ..... engellerden arındırılmış en az 150 cm net geçiş genişliği var mıdır?	EVET				
								HAYIR				
					*	B	Az yoğunluktaki yaya kaldırımında tüm yayaların serbestçe hareket edebilmeleri için ..... engellerden arındırılmış en az 200 cm net geçiş genişliği var mıdır?	EVET				
								HAYIR				
					*	B	Yaya kaldırımında taşıt yolu tarafında en az 50 cm genişliğinde emniyet şeridi var mıdır?	EVET				
								HAYIR				
					*	C	Orta yoğunluktaki yaya kaldırımında tüm yayaların serbestçe hareket edebilmeleri için ..... engellerden arındırılmış en az 250 cm net geçiş genişliği var mıdır?	EVET				
								HAYIR				
					*	C	Yaya kaldırımında taşıt yolu tarafında en az 50 cm genişliğinde emniyet şeridi var mıdır?	EVET				
								HAYIR				
					*	D	Yüksek yoğunluktaki yaya kaldırımında tüm yayaların serbestçe hareket edebilmeleri için ..... engellerden arındırılmış en az 300 cm net geçiş genişliği var mıdır?	EVET				
								HAYIR				
					*	D	Yaya kaldırımında taşıt yolu tarafında en az 120 cm genişliğinde emniyet şeridi var mıdır?	EVET				
								HAYIR				
			Eğim (Boyuna-enine)		*		Yaya kaldırımında yağmur suyunun drenajı için gerek duyulan enine (yanal) eğim en fazla %2 midir?	EVET				
								HAYIR				
							Yaya kaldırımının sürekli boyuna eğimi var mıdır?	EVET				
								HAYIR				
							Yaya kaldırımının boyuna eğiminin en fazla % 5 midir?	EVET				
								HAYIR				
					*	evet ise	Yaya kaldırımında boyuna eğimin % 5'in üzerinde olduğu yerlerde 10 m'de bir en az 150 cm'lik düz dinlenme alanları var mıdır?	?? eğim % 15 ise???				
			Zemin yüzey yapısı	kaldırım kaplaması	*		Yaya kaldırımı düz, sabit, dayanıklı ve ıslak-kuru halde kaygan olmayan malzeme ile kaplanmış mıdır?	EVET				
								HAYIR				
					*		Kaldırım yüzeyi üzerinde 1,3 cmden fazla açıklık var mı? (kaplama malzemesi derz boşluğu, rögar ızgara takımı açıklığı gibi)	EVET				
								HAYIR				
					*		Yaya güzergahı üzerinde rögar ızgara takımı var ise yaya güzergahına dik yönde konumlandırılmış mıdır?	YOK				
								EVET				
								HAYIR				
				a) klavuz iz			Tehlikeye (kot farkı, engel, yaya geçidi) veya karar verme noktasına (sağa, sola dönüş) dikkat çekmek amacıyla uyarıcı yüzey uygulanmış mıdır?	EVET				
								HAYIR				
							Hissedilebilir yüzeyin yüksekliği en fazla 8 mm midir?	EVET				
								HAYIR				
							Hissedilebilir yüzeyin rengi çevreleyen yüzeyle zıt renklerde fark edilebilir renk tonlarında mıdır?	EVET				
								HAYIR				
							Hissedilebilir yüzeylerin üzerinde, ayaklı ilan/reklam panoları, aydınlatma direkleri, park halindeki araç gibi hareketi engelleyici, sabit veya hareketli eleman bulunuyor mu?	EVET				
								HAYIR				

Figure 63: The Second Step: Physical Modelling- A Part of the data of the Model: Movement through a sidewalk

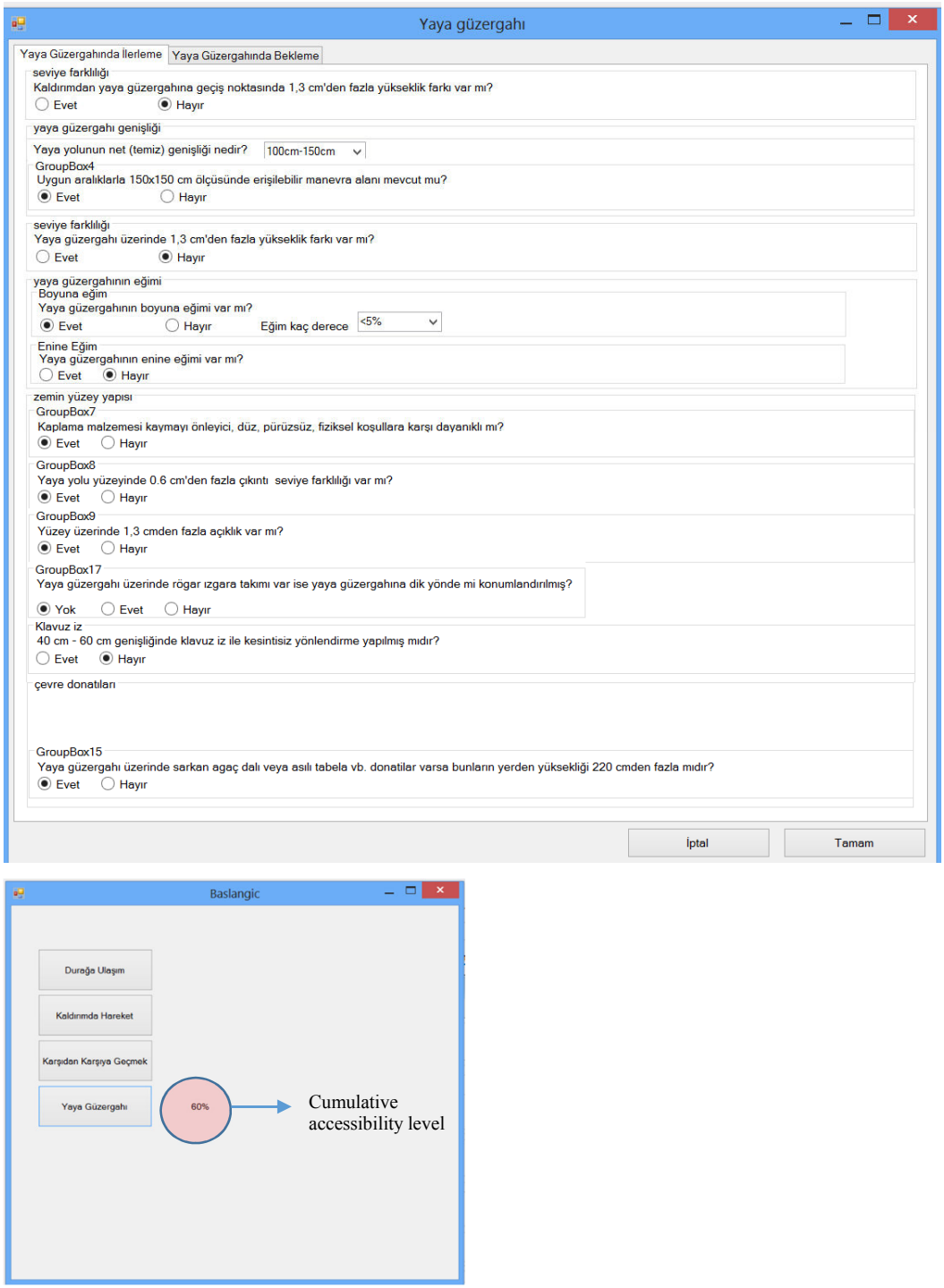


Figure 64: The Third Step: Software Modelling- the test of the model in a field based on activity of the user from shuttle stop towards a building entrance

APPENDIX B

ETHICAL COMMITTEE APPLICATION FORM

Middle East Technical University
Human Subjects Ethics Committee Application Form

Studies conducted in Middle East Technical University (METU) and/or studies conducted by METU personnel/students, which involve collecting data from human participants, are subject to review by the METU Human Subjects Ethics Committee (HSEC). Applicants should submit this application form to the METU HSEC along with the other required documents (see the Application Check List). Approval of the HSEC is required before the start of data collection from human participants.

1. Title of study_____
2. Type of study (Check the appropriate box)
□ Academic Staff Study □ Doctorate Thesis □ Master Thesis
□ Other (specify) _____
3. Researcher's / Researchers':
Name – Surname _____ E-mail address_____
Department_____Phone_____
Address_____
4. Advisor's (or the Supervising Faculty Member's):
Name – Surname (If applicable)_____ Phone _____
5. Expected time frame of the study/project: Start ___/___/____ End ___/___/_____
6. Organizations, institutions in which data collection is planned to be accomplished:
a. _____ e. _____
b. _____ f. _____
c. _____ g._____
d. _____ h._____
7. Whether the project is supported/funded or not:
□ Supported □ Not Supported
If supported, specify institution: □ University □ TUBITAK
□ International (Specify)_____ Other (Specify) _____
8. Status of the application :
□New Application □ Revised Application □ Extension of a Previous Project
If it is an extension of a previous project, does the current study show any differences from the previously approved one? □ Yes □ No
If yes, please explain: _____
*Undergraduate students conducting research must have an academic advisor/instructor supervising their research.

9. Does the study require giving partial/incorrect information to the participants or keeping them completely uninformed about the purpose of the study? □ Yes □ No

If yes, please explain:_____
_____

10. Does the study involve questions/items, procedures or manipulations/applications that jeopardize the physical or mental health of the participants? □ Yes □ No

If yes please explain:_____

11. Number of participants: _____
12. Will there be a control group? □ Yes □ No
13. In the list below, please check the items which best describe the participants of the study.
    - □ University Students
    - □ Employed Adults
    - □ Currently Unemployed Adults
    - □ Preschoolers
    - □ Elementary School Students
    - □ High School Students
    - □ Child Laborers
    - □ Senior Citizens
    - □ Mentally Handicapped / Challenged People
    - □ Physically Handicapped / Challenged People
    - □ Prisoners
    - □ Other (Please Specify) _____
14. From the list below, please specify the methodology to be included in the study.
    - □ Survey
    - □ Interview
    - □ Observation
    - □ Administering a test in a computer environment
    - □ Video/film recording
    - □ Voice recording
    - □ Having participants use alcohol, drugs or any kind of chemicals
    - □ Exposure to high intensity stimuli (light, sound, etc)
    - □ Exposure to Radioactive Material
    - □ Other (Please Specify) _____

APPENDIX C

ETHICAL COMMITTEE PROJECT INFORMATION FORM

Middle East Technical University Human Subjects Ethics Committee
Project Information Form

1. Write a detailed description of your study including your hypotheses.
2. Explain the data collection plan, specifying the methods, scales, tools and techniques to be used. (Please hand in a copy of all types of scales and questionnaires to be used in the study along with this document.)
3. Write down the expected results of your study.
4. Does your study involve items/procedures that may jeopardize the physical and/or psychological wellbeing of the participants or that may be distressing for them? If yes, please explain. Specify the precautions that will be taken to eliminate or minimize the effects of these items/precedures.
5. Will the participants be kept totally or partially uninformed of the aim of the study? If yes, explain why. Indicate how this will be explained to the participants at the end of the data collection in debriefing the participants.
6. Indicate the potential contributions of the study to your research area and/or the society.
7. Write down the titles, dates of previous research projects you have conducted or that you have taken part in and the names of funding institution(s) if any.

Researcher's: Name-Surname_____ Signature _____
Advisors's: Name-Surname_____ Signature _____

APPENDIX D

ETHICAL COMMITTEE INFORMED CONSENT FORM

This study has been conducted by İlkay Dinç-Uyaroğlu who is a Ph.D student in the Department of Architecture, the Middle East Tecnical University (METU). The aim of the study is to collect the data about spatial experiences of METU students with wheelchairs and visual impairments. For this aim, the researcher will pose interview questions while travelling with each participant in the METU campus outdoors. Participation in the study must be on a voluntary basis. No personal identification information is required in the questionnaire. Your answers will be kept strictly confidential and evaluated only by the researcher; the obtained data will be used for scientific purposes.

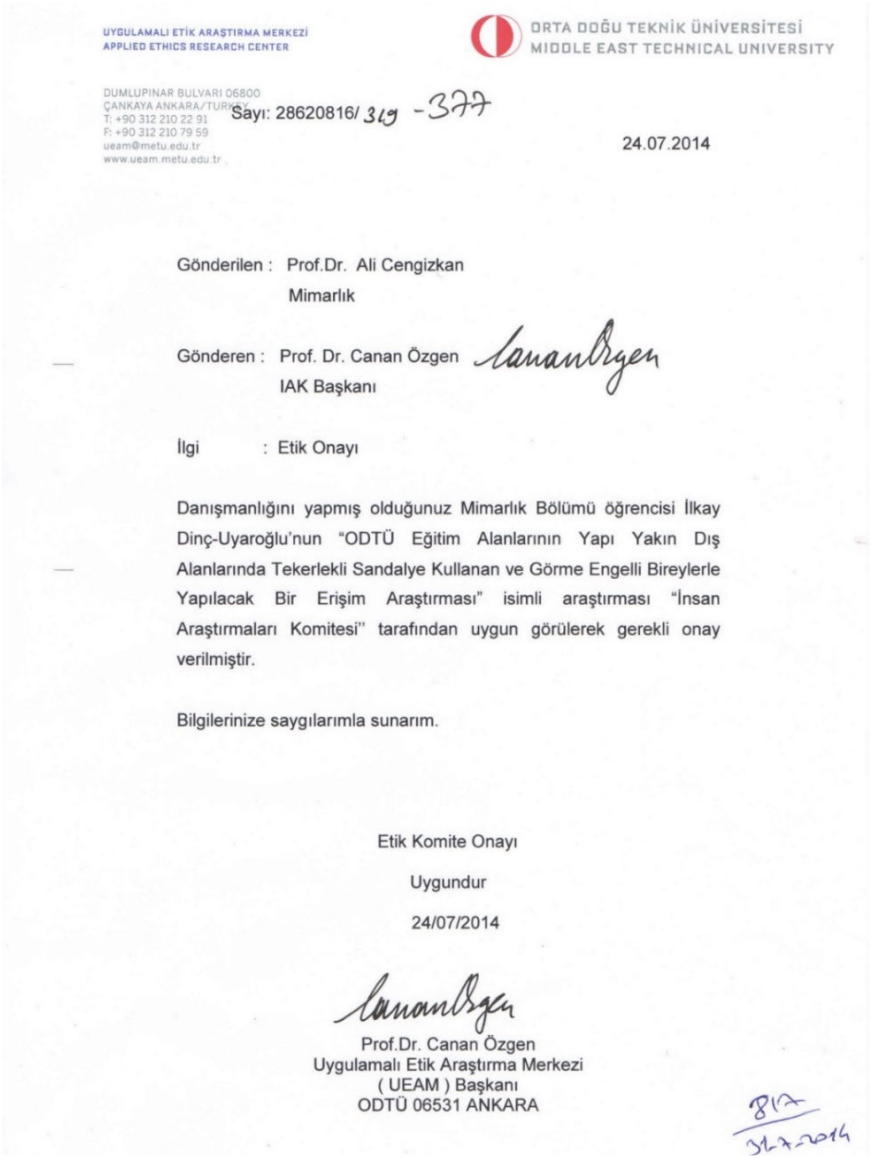
The questionnaire does not contain questions that may cause discomfort in the participants. However, during participation, for any reason, if you feel uncomfortable, you are free to quit at any time. In such a case, it will be sufficient to tell the person conducting the survey that you haven not completed the questionnaire. After all the questionnaires are collected back by the data collector, your questions related to the study will be answered. I would like to thank you in advance for your participation in this study. For further information about the study, you can contact Ilkay Dinç-Uyaroğlu (Tel: 0 532 673 5218; E-mail: idinc@metu.edu.tr / ilkaydinc@gmail.com)

I am participating in this study totally on my own will and am aware that I can quit participating at any time I want/ I give my consent for the use of the information I provide for scientific purposes. (Please return this form to the data collector after you have filled it in and signed it).

Name Surname	Date	Signature
	----/----/-----	

APPENDIX E

ETHICAL COMMITTEE APPROVAL OF HUMAN RESEARCH



UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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24.07.2014

Gönderilen : Prof.Dr. Ali Cengizkan
Mimarlık

Gönderen : Prof. Dr. Canan Özgen
IAK Başkanı

İlgi : Etik Onayı

Danışmanlığını yapmış olduğunuz Mimarlık Bölümü öğrencisi İlkay Dinç-Uyaroğlu'nun "ODTÜ Eğitim Alanlarının Yapı Yakın Dış Alanlarında Tekerlekli Sandalye Kullanan ve Görme Engelli Bireylerle Yapılacak Bir Erişim Araştırması" isimli araştırması "İnsan Araştırmaları Komitesi" tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı

Uygundur

24/07/2014

Prof.Dr. Canan Özgen
Uygulamalı Etik Araştırma Merkezi
(UEAM) Başkanı
ODTÜ 06531 ANKARA

APPENDIX F

VERİ TOPLAMA ARACI: AÇIK UÇLU MÜLAKAT SORULARI

A) KİŞİSEL BİLGİLER:

1. Engel türünüzü belirtiniz.
2. (Görme engelli katılımcı için) görme derecenizi belirtiniz.
3. Hangi bölümde öğrencisiniz?
4. Ne zaman eğitime başladınız?
5. İngilizce hazırlık eğitimi aldınız mı?
6. Nerede ikamet ediyorsunuz?

B) MEKÂNSAL DENEYİMLER

Kampüse ulaşım;

1. Kampüse nasıl (hangi araçla/rla) ulaşıyorsunuz?
2. Kampüse ulaşım için hangi durak veya otoparkta iniyorsunuz?
3. Kampüse ulaşımda size yardımcı olan birileri oluyor mu?
4. Hangi ulaşım yöntemiyle ulaşmak daha kolay, güvenli, bağımsız oluyor?

Kampüs dış mekanlarında dolaşım;

5. Genelde kullandığınız dolaşım güzergâhı ve yapı yakın dış alanlarını (aşağıda belirtilen) her tür erişim amacını içererek tarifler misiniz?

    a. Fakülte binasına ve çevresindeki farklı amaçla kullanılan dış mekânlara erişim
    b. Kampüs içindeki diğer binalara erişim
    c. Ortak kullanılan dış mekânlara erişim

6. Neden böyle bir dolaşım güzergahı kullanıyorsunuz? Kampüs dış mekanları kullanımınızı etkileyen nedenlerden bahseder misiniz?

7. Mekan(d)a/binaya erişim olanakları konusunda ne düşünüyorsunuz? (Dolaşımın sürekliliği, aydınlatma, uzaklık, hava şartlarına göre durum değerlendirmesi vb. açısından)

    a. Kampüste erişimle ilgili deneyimlediğiniz iyi uygulamalar ve erişim problemlerinden bahseder misiniz?

8. Mekana güvenli erişimin sağlandığını düşünüyor musunuz? Deneyimlerinizden bahseder misiniz?

9. Mekandaki yönlendirme konusunda ne düşünüyorsunuz? Mekansal düzen, yönlendirici işaretler& semboller ve farklı zaman ve mevsim şartlarındaki erişiminizle ilgili deneyimlerinizden bahseder misiniz?

    a. Uygun yönlendirme sağlanmadığı durumlarda nasıl hissediyorsunuz?

10. Bağımsız olarak en kolay, rahat ve güvenli ulaşım güzergâhları, alanlar ve dış mekânlar hakkında bilgi verir misiniz?

11. Dolaşırken rahatsızlık duyduğunuz durumlar oluyor mu? Bahseder misiniz?

12. Kullanmak istediğiniz fakat fiziksel engellerden dolayı ulaşamadığınız dış mekan var mı? Evet ise, lütfen belirtiniz.

    a. Bu durumun üniversitenin eğitim olanaklarına erişiminize ve kampüs yaşamına katılımıza etkilerinden bahseder misiniz?

13. Kampüse ilk geldiğiniz zamanla, şimdiki durumu karşılaştırınca nasıl bir değerlendirme yaparsınız?

    a. Fiziki çevre özelinde
    b. Kampüs yaşamına sosyal katılım özelinde
    c. Birseysel gelişim özelinde

14. Kampüs dış mekânlarının mevcut fiziki durumu aktivitelere katılımınızı nasıl etkiliyor?

    a. Kampüs mekansal ortamına eşit erişim konusundaki düşünceleriniz neler? Fiziki çevrenin kampüs yaşamına eşit katılımı etkilediğini düşünüyor musunuz? Bu konudaki tecrübelerinizden bahseder misiniz?
    b. Ders çalışmak ve arkadaşlarla buluşmak için hangi mekanları tercih ediyorsunuz? Tercihinizin nedenlerinden bahseder misiniz?

APPENDIX G

DATA COLLECTION TOOLS: OPEN-ENDED INTERVIEW QUESTIONS

A) PERSONAL INFORMATION

1. Please specify your type of disability.
2. Please specify your degree of vision (for participants with visual impairments).
3. In which department are you studying?
4. When did you begin your university education in METU?
5. Did you undertake English preparation education here?
6. Where do you live now?

B) SPATIAL EXPERIENCES

Access to the campus;

1. How do you access (by which modes of transport) the campus?
2. Which stop, station or car parking area do you most commonly use?
3. Is there anyone who helps you when coming to the campus?
4. Which mode of access do you prefer in order to access to the campus easily, safely and independently?

Travelling in the outdoor campus environment;

5. Please describe the circulation path and outdoor spaces between buildings that you most generally use, indicating:

    a. Access towards your faculty building and the outdoor spaces in its vicinity
    b. Access towards other buildings on campus
    c. Access to commonly used outdoor campus spaces

6. Why do you prefer this circulation pattern within the campus? Please describe what influences the ways you use the outdoor campus space.

7. What do you think about the access to outdoor spaces and the buildings? (in terms of continuity of circulation, lighting, distance, spatial use under different weather conditions)

    a. Please explain the spatial factors that hinder or support your access within the outdoor campus space.

8. Do you think safe access provided in the space? Please explain your spatial experiences in this regard.

9. What is your opinion about orientation in the space? Please provide your opinions on the spatial layout, signage, landmarks and access at different times and under different weather conditions.

    a. How do you feel when the space is lacking in terms of orientation measures?

10. Please show and/or describe the spaces/paths that enhance independent, easy and safe access for you.

11. Have you experienced any uncomfortable or disturbing situations while moving around the outdoor campus spaces? If yes, please explain.

12. Are there any spaces that you want to visit, but cannot reach due to physical barriers? If yes, please explain.

    a. Please explain the impact of the existing spatial barriers on your access to the university's educational opportunities and participation in campus life.

13. Have there been any changes in the campus environment since you first came here, in terms of:

    a. Physical spatial environment
    b. Social participation in campus life
    c. Individual growth

14. How has the current physical condition of the outdoor campus spaces influenced your participation in on-campus activities?

    a. What is your opinion of equitable access in campus? Do you think the condition of the campus spaces hinders or promotes equitable access? Please describe your experiences.
    b. Please describe the places in which you prefer to study and to meet your friends for social activities. On what do you base your preferences?

APPENDIX H

STATEMENTS OF THE PARTICIPANTS (IN TURKISH) REFERRED IN THE THESIS

5.4.1 Experiences of the User Group A: Students with wheelchairs

5.4.1.1 Circulation in the outdoor campus environment

…….

Eskiden Etlik'te oturuyorduk, o zaman ders bitti dönmek zorundasınız. Burda hiçbir etkinlik yok yani, bir de kocaman bir kampüs var. Ondan sonra Çiğdem'e taşınmıştık, o beni çok özgürleştiren bir şey oldu aslında. Çiğdem'den sonra benim ortamım oldu aslında. Yani gene bak tamamen şeye bağlanıyor. Şuana kadar hiç düşünmemiştim. Fiziksel durumla ilgili direk. Çünkü benim ortamım şeyden sonra 1. Sınıfın sonunda buraya taşındıktan sonra oldu… Hazırlıktayken beni birisi getiriyor bırakıyor ders çıkışı da geri alıyorlar, dönüyorum. (User A-4)

……

Akülü sandalyem yok, şu yüzden yok. Bizim arabamız küçük olduğu için onu getir götür yapmak mümkün değil. Ağır, pratik değil taşımak. Bir de ODTÜ'de akülü sandalyeyle gidilebilecek mesafeler sınırlı. Lisanstayken düşünmüştük aslında, bölümde olsa onla laba (laboratuvara) veya kantine derse insem diye. Fakat aslında manuel olması benim kaslarımı çalıştırmam konusunda da destekleyici olduğu için çok da tercih etmedim. Ama en önemlisi fiziki çevre pek elverişli değil. Yani mesela ODTÜ'de bir sürü merdiven çıkıyoruz, ister istemez. Ankara içinde de öyle açıkçası. Manuelle, birisinin yardımıyla akülüyle geçemeyeceğim yerlere ulaşabiliyorum. Kaldır indir durumu daha rahat oluyor… Her yer erişilebilir olsa akülü sandalyeyle her yere gidebilirim tabi. (User A-1)

Onlar (akülü tekerlekli sandalyeler) arabada taşınmıyor. Hani böyle minibüsümüz falan olsaydı o zaman, olabilirdi. Ya da bazen arkadaşım kaldırıyor falan, bu olunca gidiyorsun… Alan düz olmak zorunda akülü olduğunda… Annem getirip götürdü kendi arabamızla lisans ve yüksek lisans (8 yıl) boyunca. Çok uzun bir yol olunca bırakıp dönemedi. Ne para ne zaman yetmeyeceği için zaten derslerimi de ona göre seçiyordum. Kendi bölümümden

seçmeye çalışıyordum. Annem bekliyordu beni kantinde, gelip gitmeyi yapamayacağı için... Eğer benim imkânım olmasaydı, arabamız olmasaydı, ben okulu bırakırdım muhtemelen. (User A-5)

…….

Biriyle takılma zorunluluğu çok kötü bir şey! Arkadaşlarla gitmek güzel ama benim kafam bozuldu bir yürüyüşe çıkayım diyemiyorum. Kulaklığımı takayım, müziğimi dinleyim, bir tur atayım diyemiyorum. Ders bittiyse orada durmak zorundasın. İnsanlar gidiyorsa, 'gelir misin?' (diyorlar): gelemem yani başka karşılığı yok. (User A-5)

Bir şeyi kendi başına yapmak özgüveni çok geliştiren bir şey. Ben o kazayı ilk geçirdiğim sene, beni ya babam ya annem sürüyordu arkadan. Sürekli yanında birisi olması çok şey ya! Hani onu düşünüyorsun, onun da sosyal hayatı var. Yani ne bileyim, çok insanı mutlu eden bir şey değil. Birini bağlı tutmak istemiyorsun. (User A-3)

…….

Önce ders programlarımızı alıyor (servis şoförü). Bu saatler arasında buradan buraya diye belirtiyorum. Ders olduğu zamanlar getiriyor götürüyor, sınavlar için de ayrı bir program veriyoruz, yine ona da uyuyorlar. Ama onda da ani bir karar veremiyorsun. Mesela arkadaşlarla beraber saat yedide çıkalım dediğimde, ani bir karar olunca, onların işleriyle çakışabiliyor. O yüzden ben o programa uyup o şekilde devam ediyorum… Aslında bana sorarsanız, tüm şey (fiziki çevre) sorunsuz olsa, metroya otobüse biner arabaya binmezdim. (User A-3)

…….

O (uzun olan) yolu kullanmamak için bölüm binasına en yakın olan merdivenin yanına, bölüme direk çıkan bir rampa istemiştim. Onun için ölçü falan aldılar. Öyle olunca otoparktan direk çıkabileceğim. Böyle olunca baya bi gidiyorum. Kışın soğuk oluyor, kar falan oluyor geçilmiyor… Mesela bir kere şey olmuştu. Geldim, karı gördüm, geri yurda döndüm! Çünkü çıkılacak gibi değildi. (User A-3)

5.4.1.1.1 Spatial factors

Level differences

…….

Genellikle taşıt yolunu kullanıyorum. İlk başlarda kaldırımı çok kullanıyordum. Ya iniş yok, ya ağaç var, sağdan soldan geçilmiyor. Ağaçlar herkes için sıkıntı. Öyle olunca geri dönüyorum geldiğim yolu. O yüzden kaldırımda gitmek sıkıntılı oluyor… Akülü sandalye olduğu için taşıt yolundan birçok yere çıkabiliyorum… Taşıt yolu uzatıyor. Hani bir oraya ulaşmak var, bir de binaya. İki extra iş oluyor. Arabalarla bazen burun buruna geldiğim olabiliyor… Ama kaldırıma çıkabildiğim birkaç yer var, oralar fena değil. (User A-3)

Ben o orta yolu (Alley) - tüm öğrencilerin kullandığı- hiç kullanmıyorum. Hep merdivenli çünkü. Hep ana caddeden gidiyorum. Hani orayı kullanabiliyor olsam daha kolay olurdu, daha kısa zaten. (User A-5)

Eğimli (yan eğimi olan) kaldırımlardan rahatsız oluyorum. Ya da kaldırımın ortasında ağaç olunca: şu taraftan geçemiyorsun sıkışmak durumunda kalıyorsun, diğer tarafta da aşağıya düşecek miyim düşmicek miyim hissi yaşatıyor. Ağacı kesmesinler de tabi, kaldırımı genişletebilirler. (User A-1)

Böyle, yol boyunca gidiyordum. Kaldırımlar tehlikeli 'niye tehlikeli?': Şimdi bu tarafta çıkacak rampası vardır, ama öbür tarafta ucunda inecek yer var mı? Bilmiyorsun ya. Bazen çıkıyordum. Ondan sonra öbür tarafta inecek yer olmayınca öyle kalıyordum kaldırımda. Geri dönmek zorunda kalıyordum çıktığım yere. Gerçi ODTÜ'de tecrübe ediyorsun herşeyi tanıyoruz sonradan da. (User A-2)

Caddeden gittiğiniz sürece sorun yok! Kaldırımdansa burayı tercih ediyorum. Çünkü oraya güvenemiyorum, zeminden dolayı bazen kayabiliyorum çok ufak falan, güvenli hissetmiyorum kendimi. Rampalar (kaldırım rampaları) da öyle yapılmış olmak için yapılmış gibi… Yani mecbursunuz! Alternatif yok! Ne yola aitsiniz, ne kaldırıma. 'Ben yaya mıyım, araç mıyım?' oluyorsunuz! (User A-4)

…….

Biz şu aralara (kaldırımdan yaya yollarına) inerdik. Kaldırım yeni yapıldıktan sonra inemiyorum artık. Diğer taraflardan da inişler vardı. Onlar kaldırım yükselince iptal! Önceden kaldırım taşı yoktu. Çimentodan kaldırımlar ince ve şeydi o yüzden, yükseklik problemi de olmayan şeylerdi. Yükseklik fazla olunca da rampa yüksek oluyor, olamıyor! Ama alçak olunca şu aralarda toprakla birleşen yerler oluyordu girebiliyorduk açıkçası. Kaldırım olunca iptal olmuş. (User A-4)

Surface of the ground

…….

Bunların (Alle arnavut kaldırımı zemin kaplaması) üzerinde çok gittiğim zaman ayağım falan karıncalanıyor, kaşınmaya falan başlıyorum. (User A-1)

Arnavut kaldırımı biraz sıkıntı hani böyle şey zızzzz oluyorsunuz. Şey sorun oluyor: Bir giriyorsunuz! Çoğu felçlinin de öyledir bacaklarında kasılmalar oluyor hani ani bir uyarıya tepki veriyor sen onu kontrol edemiyorsun öyle olunca böyle bir dengesizlik oluyor. (User A-3)

Allede sıkıntılı gitmek, ama insanı yavaşlatsa ve biraz yorsa da tolere edilebilir… Şurası (kaldırım) bile çok konforlu değil ben bu kaldırımı kullanmam çünkü iniş çıkış (pürüzlü yüzey) olduğu için yüzeyde bu da yoran bir şey. Özellikle derse yetişeceksem direk yoldan giderim burayı kullanmam. (User A-4)

…….

Tekerleğim kırıldı, sınava yetişirken. Bizim kantinin önünde arabadan indim, yetişmek için koşuyordum asansöre doğru. Dışardaydım. Bir anda çat diye

tekerim kırıldı, ön tekerimi tutan şey. Yere inmedim ama öne eğildim böyle. Boşluklar var ya yerde ön tarafta oraya takıldım. O anda kaldım kıpırdayamıyorum! Sınava gidemedim tabi. (User A-5)

…….

O (okula başladığım ilk zamanlarda) kampüsü iyi bilmiyordum. O dönem bırakmayı bile düşünmüştüm. Yani (fiziki çevre) çok problemliydi. Bir de bizim bölümlerde tek bölümde ders olmuyor bölümler arası da ders olduğu için bazen İktisat'a bazen Mimarlık'a (gidiyordum), valla dedim 'yapamıcam!' Akülü sandalyem de yoktu üstüne üstlük. Manueldi o zaman. Kullanamıyordum tek başıma yani yol keşfetme şansım da yoktu. İşte o ara bir bırakasım gelmişti açıkçası. Sonradan taşındık Çiğdem'e. O zaman akülü sandalyem oldu. Sonra yavaş yavaş keşfetmeye başladım. O keşif süreci benim bireysel çabamla oldu yani. O zaman sandalyeli bir arkadaş da yoktu okulda, 'nereden nasıl gidiyorsun?' diye sorabileceğim, öyle bir sıkıntı. (User A-4)

Daha düzgün bir rampa olsa daha erişilebilir bir şekilde tasarlansa herkesle eşit mesafede gidebiliriz. Daha erişilebilir yollar bulmak için uzatmak zorunda kalıyoruz… En temel yerleri kullanamadıktan sonra küçük yerleri değiştirmenin pek bir anlamı olmuyor diye düşünüyorum. (User A-1)

5.4.1.2 Approaches to outdoor spaces and buildings

…….

Binaya gitmek için de genelde toprak yolu ve orta yolu (Alleyi) kullanmak zorunda oluyorum. Birkaç yıl önce fiziğe falan gitmiştim. Oraya da ulaşmak için Fizik'in arkasını kullanıyordum… Bir yere kadar taşıt yolunu kullanıyorum. Sonra toprak yol, gerekirse, ve düz yola çıkmaya çalışıyorum. (User A-3)

Zaten her yerde bizim tek sıkıntımız: Merdiven! Basamak! Kampüste (Alle'de) her merdivenin yanında çimler var. Tek sıkıntım, işte bu çimlerden bazen tek başıma çıkamıyordum. Burası kışın yağmurda çamur oluyordu. Ya da kar yağdığı zaman çıkamıyordum. O zaman işte yanımda birileri oluyordu, itiyordu. 'Ya bi yardım eder misin?' diyordum, birilerine söylüyordum. Ya da zaten arkadaşlarla gelip gittiğimizden onlara söylüyordum. Yani temel prensip: Kaldırıma çok çıkmadan gidebildiğin yere kadar git, ondan sonra çimleri kullan, toprakları kullan. (User A-2)

5.4.1.3 Spatial use in the near vicinity of the department building, considering daily life behaviors

Participation to educational activities

…….

Orada (kendi bölümünde, farklı blokta) bir ders almadım. Olursa da baya zor. Arka tarafta bir alet (merdiven üzeri lift) var, D bloğun kantinin olduğu yerde.

Sonradan yapılmış gibi ama çok uygun değil, kullanması zor. Kırk yılda bir kullandım o da yardımlarla falan yani çok kullanışlı bir şey değil. Zaten o taraflarda dersim olmadı ama gelecek sene laboratuvarım olabilir. Onu da bir şekilde ayarlamaya çalışacağız. (User A-3)

…….

Bölümden (Beşeri Bilimler'den) kütüphaneye gitmek baya kolay erişilebilir ama zaten yakın bir mesafe. Bizim otoparkın arkasından Fizik'e geçtiğimiz Fizik'i dolandığımız yerden geçersek, Fizik çimleri Fizik'tir oralar da gayet erişilebilir. Bunun dışında pek yok benim için. (User A-1)

Matematik, Fizik, onların kantini ve Üçlü Amfi'de hiçbir sıkıntı yok. Kütüphaneye çok rahat gidiyordum, o sıkıntısız. Bu Allede sıkıntılı gitmek ama insanı yavaşlatsa ve biraz yorsa da tolere edilebilir. Onun dışında diğer yerlere hep yardım lazım. (User A-4)

…….

Bütün dil dersleri seçmeli ders olarak saydırılabiliyordu bizde ama dil bölümüne gidemediğim için ve yukarıya da çıkamayacağım için hiçbir dil dersini alamadım. Hemen karşıdaydı aslında bizim binanın. Birileriyle konuşsaydım yaparlardı belki ama zorlamaya gerek görmedim. Herkesin ikinci üçüncü dili oldu en azından, benim olamadı. Ben kendi binamdan çıkmayacak şekilde derslerimi seçtim… Tekerlekli sandalyede yaşıyorsan planlı programlı yaşamayı öğreniyorsun. 'Bir yolunu bular giderim' diyemiyorsun, gideceğin saat, gittiğin yerin neresi olduğunu önceden bilmeliyim, görmeliyim. Başka bir binada ders alınacaksa önce bir gidiyorum binaya 'oraya girebilir, ders alabilir miyim?' diye bakıyordum. Alamıyorsam, yazışmaları yapıyorsun ya dersten muafiyetini istersin ya dersin başka bir yerde yapılmasını istersin. Her seferinde nereye gittiğime, nasıl gittiğime bakmam gerekiyor. Ya çok gözü kara biri olacaksın, hiçbir şeyi umursamayan. Ama şimdi ben öyle biri değilim. Çok çabuk üzülürüm. Çabuk üzülen birisi olduğum için de üzülmeyeceğim şekilde yaşıyorum. (User A-5)

Participation in social & leisure activities

…….

Yani mesela çok arkadaşlarla takılamıyorum, çünkü sürekli ya 'bir yere nasıl gidecem?' servis bırakacak, hadi güle güle! Servisle oraya gittim buraya geldim! Hani dersten çıkanlar gidecekleri yere birlikte karar veriyorlar ya yani o mekanizma çok yok. Biraz daha disiplinli olmalıyım: 'şu saatte şurada olmalıyım' gibi oluyor biraz… Arkadaşlarla toplanalım bir şeyler yapalım demek benim için biraz zor oluyor. Ben o kadar becerikli değilim herhâlde… Öyle her şeyi beraber yapabildiğim bir şey yok… Başta bu (mekânsal engeller) engel oluyor sonra bunu kabulleniyorsun ve bir kabuğuna çekiliyorsun gibi oluyor. Kendi stilini buluyorsun ama bu stilde çok sosyalleşme olmuyor. İşlerimi halledeyim yapayım, edeyim, yetişiyim oluyor yani. Benim açımdan öyle oldu yani. (User A-3)

…….

Ben ilk sene çok problem yaşadım. Gidemediğim çok oldu mesela. Şöyle, mesela hazırlıktayken Mimarlık'ta çorba içeceğiz, gidemiyorum! Neden? Yol yok, bizim Hazırlık'tan (Mimarlık'a) geçme şansımız yok gibi. Hazırlıkta sıkıntım oldu yani. 'Siz gidin ben bekleyim' oldu. Hazırlıkta mesela çok fazla arkaşım yoktu işte tamamen fiziksel problemlerden dolayı. Acayip mutsuz bir dönem geçirdim. Arkadaşlarla etkileşimim yok, ders arasında sınıfta oturuyorsunuz… Ki ben sosyal bir insanım, öyle olmasam iyice içine kapanabilir insan. Yardım istemen gerekiyor çünkü. Engel etkiliyor tabi ki. Hazırlıkta o kötü etkiledi. Buraya ait olma sürecini çok yavaşlatan bir şey. (User A-4)

Bizim (Beşeri Bilimler) kantine ne içerden ne dışardan erişilebiliyor. Bu yüzden benim lisansta çok fazla kantin sohbetim olmadı mesela. O açıdan etkileyen bir şey mutlaka. Benim kendi arkadaşlarımla değil de. Diğer bölümdeki arkadaşlarla kaynaşmamı zorlaştıran bir şey yani. Çünkü diğer bölümdekileri nerde görücem kantinde görücem yani. Hani kendi arkadaşlarım bunu sorun yapmadılar, sorun yapmadıkları için arkadaş olduk ayrıca da. (User A-1)

…….

Yani ben tek başıma gidemediğim için illa ki biri benle oluyor. Grup halinde olsak, şeyi öneriyoruz: Şuradaki yokuştan çıkcaz (Üçlü Amfi yanını tarif ediyor), 'isterseniz siz gidin biz şuradan dolanıp geleceğiz diye' bir seçeneği sunuyoruz. Can sıkıcı oluyor. Burası biraz dik olmakla beraber yine de ODTÜ'de bulduğumuza şükrettiğimiz yokuşlardan bir tanesi. (User A-1)

Şey gibi gelebiliyor insana 'ee tamam bölüme ulaşılıyor (otoparktan), içeri giriliyor, bölüm de güzel!' Ama işte dışarda dolaşmaya başlayınca sıkıntı başlıyor. İllaki yanında birisi olmaya başlıyor… Biz genelde toplu gidiş yaptık ama o konuda şanslıydım olmayadabilirdi. Aynen benim güzergâhtan birlikte giderdik, mecburiyetten kaynaklı… Biraz da güçlü arkadaşlardan 3-5 kişi hayde diye kaldırdıkları oluyordu, ama yapılabilecek bir şey yok. Çok yapılabilecek alan var yani burada, yani rampayı da o yüzden dedim. Beraber yürünebilen bir yer olması bakımından niye asansöre bineceksiniz. O çünkü şeyi yavaşlatan bir şey. (User A-4)

5.4.1.4 Spatial use in different times of education period in consideration of participation to campus public life

…….

Yani genelde şey oluyor bu öğrenci toplulukları haftada bir, bir yer ayarlayıp akşamüstü orada buluşuyorlar. Kendimi ayarlamam gerekiyor öyle bir şey için. Mesela genelde 5:30 ve 7:30 arasında kimsenin dersinin olmadığı bir zaman toplanıp bir şey yapıyorlar, etkinlik falan düzenliyorlar ya. Servis ayarlamam gerekiyor. Gidilecek yerin uygun olması gerekiyor. Öyle şeylerin önceden planlanıp ayarlanması gerekiyor. Çok yapılamaz değil ama biraz uğraşmak gerekiyor. Servis saatleri mesai saatlerinde oluyor genelde. Yurtta kaldığım

zaman gelebilirim aslında. Yine hava soğuk olmazsa öyle şeyler olmazsa… Yemekhaneye hiç gitmedim. Var mı ulaşım onu da bilmiyorum. Dışardan gidişi bir de mekânın içine girmek benim için sıkıntı oluyor giriliyor mu yani. Hani taşıt yolundan kapının önüne kadar geldik, giriliyor mu? Düz şekilde basamaksız… Hiç gitmedim havuza mesela. Bilmiyorum tek başıma nasıl girerim. Aslında oradaki yüzme eğitmenleri falan yardımcı olsa dilekçe falan mı yazsam bilmiyorum. Ben sadece korktuğum ve birinin yanımda olmadığı için gitmiyorum ama kaslarım için en iyi spor yüzmek. (User A-3)

…….

Gidebildiğim yerleri biliyorum aslında, Çarşı, Sunshine (Cafe) tarafı… Bilmediğim yerlere bazen gidip bi kapısının önünde deneyip 'ha ben buradan girebilirim, biraz giremem galiba' gibi oluyor giremezsem vazgeçiyorum girebilirsem deniyorum ama sonra insanın aklında kalıyor ve sonra işte bir daha ki gidişte gidebiliyorum. (User A-3)

3. Sınıfta Almanca dersi aldıktan sonra burada, ondan sonra bir keşif oldu muhtemelen. Ha 'etrafta ne var Çatı (Cafe) falan, e hadi gidelim o zaman' demişizdir. Çünkü tek başına burayı keşfetme şansı yok… Ki Çatı herkesin geldiği bir yer olmasına rağmen gelmedim, o zamana kadar hiç gelmemiştim. Çünkü ulaşım problem! (User A-4)

Onu (kampüste dolaşmayı) ben hep kendi çabamla halletmeye çalıştım. Sınav yerlerini kendim dilekçe vererek 'burada giriş yoktur rampa yapılsın' diyerek, daha bireysel benimki. Adım adım benimkisi! Bir yere gidip giremediğimi fark edince, 'buraya giremiyorum ben buna bir şey yapın' gibi. Oraya gitmediysem hiç fark etmiyorum oraya gidip gidemeyeceğimi. Ne zaman gidiyorum oralara da, bir işim düştüğünde. (User A-5)

…….

Mesela Psikoloji Topluluğu'na katılamadım. Neden? Çünkü barakalar var ya tam olarak nerde olduğunu bile bilmiyorum! O barakaların önünde bir merdiven var mesela… Bir kere değil birkaç kere gittim de sonra çok erişilmez geldi… Etkiliyor tabi ki katılımı. (User A-1)

Kütüphane'ye gitmek için insanlar ne yapıyorlar? Şurdan yemekhanenin ordan iki adım yürüyorlar çat diye Kütüphane'deler. Ama ben Kütüphane'ye gitmek için şu arkadan Kütüphane otoparkı var ya oraya gidiyordum… Ben zorladım. Her şeye katıldım yani. Yeri geldi arkadaşlarımın omzunda gittim geldim. Yeri geldi arabalarında gittim, ağaca da tırmandım. Tribüne de tırmandım. Ben çok zorlardım ve zorladım. Gocunmazdım da zorlamaktan. (User A-2)

Topluluk toplantılarına hiç gidemedim. Niye? Gidiş yok. Benim buraya gelmem için onbin tane yol aşmam lazım. Bir de bir arkadaşla aynı kulüpte olmam lazım. Kimle gelicem? O problem. Hiç gelemedim ya. Tamamen fiziksel koşullardan. Hep burada oluyordu. Hiçbirisine gelmedim. Katılmak mümkün değil yani…. Eşit erişim söz konusu değil fiziksel koşullardan kaynaklı. Şey mesela tiyatro festivali olurdu Mimarlık'ta halen de oluyor. Ona gitmem için benim bir arkadaş bulmam lazım. Basamak falan var yani. En basitinden örnek bu. Gidilebilecek en ortak etkinlik yani. Şey mesela Bahar

Şenliği konserleri bile problem yukarıya stadyumun üstüne çıkılmıyor. Ki yapılabilir orada alan var. Ama işte o bile şey oluyor. Eğer arkadaş grubu aşağıya inmek istemiyorsa ki yukarıda içmek, dinlemek daha eğlencelidir. Ama! (User A-4)

Neyi yapıp neyi yapamayacağımı bilerek yaşıyorum. Bir tiyatroya gidelim demiyorum, dili (dil dersini) tercih etmediğim gibi çünkü biliyorum gidemeyeceğimi… Ya ben kampüs yaşamını yaşadığımı düşünmüyorum hani tam. Olmadı yani. Çıkışta arkadaşlarınla takılamıyorsan, hani istesem yapardım da ben de zorlanmayı sevmediğim için. Mesela arkadaşlarım burada yurtta kalıyordu. Bana hafta sonu 'piknik yapalım hadi gel, ya da çıkışta birşeyler yapalım'... Ya annem bekliyor ya da Cumartesi buraya gelemem yani. Kendim gelemediğim için 'yurda gel takılalım, ya da hafta sonu gel beraber şunu yapalım' dediklerinde yapamıyorsun. (User A-5)

…….

Hiç şey yapmam mesela (ders aralarında). Atıyorum iki saatlik ders arasında kalkıp Çarşı'ya gelmem, sonra geri döneceksem eğer. Çünkü bir sürü yol geçmek, bir sürü engeli aşmak durumunda kalırım ve yetişmez o muhtemelen. Çünkü geri dönmek de kolay değil aslında burdan bölüm (Beşeri Bilimler) tarafına. Tabiki de o çok büyük bir vakit kaybı. Yani böyle kolayca erişilebilir bir şey olmadığı için. (User A-1)

Çarşı'ya giderdik ama işte erkek arkadaşlar şahaneydi. 'Hadi gidelim ya ben götürürüm dediği' zaman bile gitmek istemiyorsun. 'Ya ne gerek var burada oturalım' diyordum. Gitsem bile ben biliyorum ya çok uzun ve yorucu yol. Ne gerek var diyordum… Çarşı'nın dört bir tarafından dolanabiliyorum. İçeri giriş var, yandan üst kata çıkış var. Orayı biz kardeşimle çok seviyoruz. (User A-5)

…….

Kampüste karanlıkta çok kalmamaya çalışıyorum. Bilmediğim yerlere pek gitmiyorum. Hani o keşif olayını sabahları yapıyorum genelde. Tabi olsa çok iyi olur. Akşam da ulaşılabilir olsa birçok şey. Mesela Kütüphane'ye gitmeyi çok isterim akşama kadar. (User A-3)

…….

Ben pek çıkamadım bölümden. Zaten annem beklediği için dersten sonra arkadaşlarla takılalım durumum pek olmadı. Yani özel bir durum varsa bir etkinlik bir buluşma tabii ki arkadaşlarımla gittim annem gelip oradan aldı beni… Tabi birinin götürmeye gönüllü olması lazım. Bahar şenliklerine gidiyordum. 'Anne ben çıkışta konsere kalıcam' deyince, annem gidiyordu. Ama hep yürüyerek gittik. O yüzden en yakın arkadaşlarım erkek arkadaşlarımdı. Burada (İşletme Bölümü) çok uzun bir yokuş var önce orayı çıkmak gerek sonra diğer tarafları… Sabah başka bir bölümde ders varsa arabayla orada iniyordum, mesela... Yani ben okudum kolaylık da sağladılar ama ODTÜ'lü gibi hissetmiyorsun… Biriyle takılma zorunluluğu çok kötü bir şey. Tamam arkadaşlarla gitmek güzel ama benim kafam bozuldu ben bir yürüyüşe çıkayım diyemiyorum. Ben bir kulaklığımı takayım müziğimi dinleyim bir tur atayım diyemiyorum. Ders bittiyse orada durmak zorundasın.

İnsanlar gidiyorsa ‘Gelir misin?’ ‘Gelemem’ yani başka karşılığı yok. (User A-5)

5.4.2 Experiences of the User group B: Students with visual impairments

5.4.2.1 Circulation in the outdoor campus environment

…….

Burası dümdüz, çok rahat ve güzel bir yol, ağaçlıklı falan. Gerçi ODTÜ’de her yer öyle. O yüzden ben hiç ringe binmem, hep yürürüm. Bir de ringe bindiğimde nerede ineceğimi kestirmem çok zor. Hızlı gidiyor, kalabalık olduğu için iyi göremiyorsun. Nereye geldik falan şüphesi yaratıyor… Kestiremiyorum bazen içeriden, yanlış yerde inebiliyorum. (User B-7)

…….

Lisem iki adım ötemdeydi. Annem bırakıyordu. Çok yanlış. Ama orada da kaldırımlarda araba vardır. Kaldırımlarda yürüyemezsin. Yoldan yürümek zorundasın. Yoldan da araba geçiyor. ‘Ee napıcaksın?’ Hani o da haklı bir yerde ama ben de haklıyım! Maalesef sıkıntı oluyordu… Yurt bana baya bir şey katıyor, her anlamda. Bu bağımsız gidip gelebilmem! Çünkü derse gidiyorsun, kendin gidiyorsun. Ee o zaman hani bir özgüven geliyor. (User B-3)

Benim bağımsız hareket burada gelişti, hala gelişiyor yani. Üniversite onun için bir dönüm noktası, tek başına kalıyorsun. Yurtta falan kalıyorsan çok iyi. Kişisel gelişime de katkısı var. Özgüveni artıran bir şey oluyor. (User B-8)

Daha önce baston kullanıyordum, daha az kullanıyordum ama. Buraya gelince daha aktif olarak kullanmaya başladım. Çünkü daha önce buraya gelene kadar bu kadar geniş bir alanda gidip gelme ihtiyacım olmamıştı. Yazın evde ailemin yanında oluyordum. Hani gerekirse çok kısa mesafelerde kullanıyordum. Onun dışında da beraber gidiyorsun geliyorsun bir yerlere. (User B-5)

5.4.2.1.1 Spatial factors

Surface of the ground

…….

Yolları öğrendikten sonra ‘zemin’ (bozuk Zemin) aslında o kadar önemli değil. Yani bir şekilde gidersin. Tekerlekli sandalye kadar zor değil bizim işimiz. Sonuçta baston gittiği kadar gidersin. O yüzden zeminin çok bozuk olması etkiliyor tabi ama o kadar şey değil… Burada burayı (düz hattı) buldum muydu direk sağ sol yapmadan giderim. Hem böyle rahat oluyor, dinleniyorsunuz. (User B-1)

Bölüme giderken bu yolu (Alle'yi) çok kullanıyorum. Bu çizgiye geldiğiniz zaman dimdik ilerleyin sağa sola sapmadan, ilerde biraz sol yapınca taş yola çıkıyorsunuz. Direk bölüme gidiyorsunuz. (User B-2)

Şurada bir yerde bir düz alan var. Bunu tercih ediyorum yürümek için daha kolay ve rahat oluyor. Iyiki bunlar var! Yoksa baston kullanma stilimi değiştirmem gerekecek. O da insanın bileğini çok yoran bir şey. Böyle daha rahat. Dinlendiriyor burası… Hah bu şeritler de burada bitiyor. Ha iyi tamam o zaman diyorum. Sağ sol yokluyorum var mı o zaman diyorum buluyorum. Tamam o zaman deyip devam ediyorum. Bulmaya çalışıyorum. Bulamazsam da bu taşlar benim Alle'de olduğumu söylüyor. Bu noktada olduğumu biliyorum. Yani sıkıntı yok! (User B-3)

Bu ana geliş yolundan (Alle'den) herkesin geldiği, çok ara yolları kullanmadan arnavut kaldırımı olan yoldan devam ediyordum. Burası rahat, buranın merdivenini (Alle üzerinde Mimarlık Bölümü girişi hizasındaki) bulduktan sonra arnavut kaldırımlar arasındaki düz çizgi var ya o rahat benim için… Arnavut kaldırımlarında düz ve hızlı yürümek- yani takip edersin de düz ve çabuk yürümek- zor, baston takılıyor çünkü orada. Arnavut kaldırımı yavaşlatıyor o yüzden. Genelde sadece biz de değil herkes buralardan (düz hat) gitmeyi tercih ediyor çünkü daha rahat oluyor. (User B-5)

Burada da mesela bu önemli (Çarşı önündeki düz zemin hattı). Bu beni direk götürür burada. Benim için sarı çizgide yürümek çok zor oluyor. Hatta topuklu ayakkabı falan giydiğimde ayağımı çok acıtıyor. Bence ergonomik değil. Ama böyle farklı bir zemin benim için çok daha kullanışlı. O sarı çizgilerin de renkleri yağmur yağınca çok belirgin olduğu için görsel olarak çok işime yarıyor. 'Yağmur yağınca zemin çok koyulaştığı için ve onlar da çok parladığı için midir?' neden bilmiyorum. Ama 'sarı olması da gerekir mi?' Zemine zıt renkli olması gerekiyor. (User B-8)

…….

Bu kaldırımlarda yavaşlayınca insanlar da yolu bilmediğimi düşünüyorlar. Hayır, yolu biliyorum fakat takılıyor bu. Sağa sola kayıyorsun daha güvenli bir yol bulmak için hızlanayım diye orada yolu kaybedebiliyorsun. O zaman da ağaca denk gelebiliyorsun. Biraz şerit kayması gibi oluyor. Düz alanı arıyorum. (User B-3)

Level Differences

…….

Bir kere şuradan (merdiven boşluğu) sağ taraftan aşağı düşüyordum. Korkuluk olması önemliymiş… Bu merdivenlere de ilk başta çok sinir oluyordum, çünkü yamuk! Yani merdivenleri takip etsen çimlere girersin. Buralar zaten benim en çok gittiğim, geldiğim yollar. Burada mesela bazen çok sağdan gidersem çöp kutusu var, ya da mesela çok sağdan giderken aşağı uçma ihtimalim var! (merdiven boşluğundan). (User B-1)

Şimdi burada kenarlar sıkıntılı. Tırtık mesela en azından öyle bir şey (olsa)! Böyle iyi değil. Biraz yüksekçe bir şey kenarda: bir güvenlik olur, hem de insanlar gelip oturur. (User B-8)

…….

Şu anda mesela gölge düşüyor merdivene. Gölge olunca orada (basamak yüzeylerinde) bir kontrast çıkıyor. O gölgelerden dolayı çok net seçebiliyorum. Normal yürüyorsunuz. Gün içinde ya da akşam farklı zamanlarda bu değişebilir tabi. (User B-2)

Bazen merdiven yüksekliklerini şaşırıyorum. Pat diye ayağımı atıp boşluğa düşebiliyorum. Uçlarında böyle bir çizgi oluyor ya onlar çok güzel bir şey. Bazı merdivenler var; merdiven olduğunu anlayamıyorsun; merdiven ama nerede olduğunu göremiyorsun. O ucundaki bantlar harika şeyler! User B-4

Merdiven inişi olduğunda merdiveni göremediğim oluyor. Bak! Mesela bunlar (basamaklar) şurdan ışık vurduğu için ve gölge yaptığı için görünüyor. Ama öyle yapmasaydı görünmeyebilirdi. O zaman biraz yavaşlıyorum. O zaman gerçekten zor oluyor, nerede bu diye… Mantık hep aynı gölge yapmadığı zaman ayırt edilemiyor, bitişikmiş gibi gözükebiliyor. Çizgileri de görünmez hale getiriyor. Öyle bir yüzeyde renk ayrımı olduğunda kesinlikle düşünürüm. (User B-7)

…….

Benim ODTÜ'de en çok sorun yaşadığım yerler karşıdan karşıya geçme noktaları. Onları bir türlü anlayamıyorum. Mesela burada artık çarşıya gitmek için karşıya geçmem lazım. Ama nerden geçeceğimi tam bilemiyorum. Böyle karambole… Birisi geliyor. Nereye gidiyorsun? Çarşıya diyorum, e tamam gidelim diyorum. Yani o yüzden burada bir işaret olması gerek. (User B-3)

Burada da karşıya geçişte kaldırım dönüyor ya biraz ilerleyip geçiyorum, bir de şu iniş (curb ramp) var ya ondan anlıyorum karşıya geçeceğimi… (Başka karşıya geçişte) Arabanın sesi, duruyorsa fren sesi işaret oluyor… Yaya geçidinin orada bir işaret olsa ben de bileceğim yaya geçidi olduğunu ama yok. (User B-5)

Environmental Components

…….

Ağaçların gövdesini görüyorum, kalın şeylerde değil ince şeylerde sıkıntı oluyor. Çok yakına gelsem de bazen göremiyorum. Defalarca kere başıma geldi. O yüzden ağaçların altları budandığı zaman daha iyi benim açımdan. ODTÜ'de çok var ya dalları inen ağaçlar. Sadece benim değil biliyorum başkalarının da onda sıkıntı yaşadığını. (User B-7)

…….

Bana 'ses' lazım benim olayım o! Elimde bir şey pek taşımak, bakmak... İki alana birden konsantre olamıyorum. Yoldayken pek telefon açmam mesela. Pek konuşmam da. Çünkü etrafta takip etmem gereken bir sürü ipucu var. Onları kaçırırım. Onları kaçırırsam da kesin yolu şaşırırım. Hiç istisnasız böyle olmuştur. User B-3

…….

Bastonla kontrol etmek gerekiyor önce. Çıkılabilir bir yer mi acaba diye… Mesela havuza düşebilirsiniz. Rektörlük'ün oradaki havuza düşen olmuş mesela… Merdivene yakın ya merdiven sanıp birkaç kişi, düşen olmuş önceden… Burada mesela ilerde sağ tarafta Kütüphane'ye giderken biraz fazla sağ yaparsanız havuza girebiliyorsunuz. Bir ara giriyordum ben yani. Hem dar olan yere hem de geniş olana girme ihtimaliniz olabiliyor. (User B-1)

Mesela burda bizim havuzumuz vardı. O konuşmuyor! Yani çalışmıyor galiba. (Havuz sınırının hattını takip ediyor). Hah mesela burası girişi. Şurası çıkıyor rektörlüğe doğru. Havuzun sesini duysam 'hah tamam!' derdim ama böyle de az çok kestiriyorum. (User B-3)

Havuz olduğu belli. İçindeki rengi değişiyor, bariz bir fark var içi kirli falan. 'Ben buradayım' diyebilen bir şey. Su da içinde burada sanırım. (User B-7)

Mimarlık'ın havuzu mesela çok işime yarayan bir şey. Diyorum ki 'ha Mimarlık'a geldim'. Girişi de anlıyorsun, çok yönlendirici oluyor o havuz. Ama yanı (kenarları) açık olursa problem olur tabi de. (User B-8)

…….

Oradaki (Kütüphane giriş platform önündeki) mazgal çok işime yarıyor. Ona gelince 'ha tamam havuza gelmedim' diyorum. Aaa! O havuza, küçücük minicik birşey bastım bir kere. O mazgal bana 'havuzu kurtardın!' diyor. Bir de insanlar çık çık bastıkları için onu hissediyorum. İnsanlar da çok yönlendirici, insanların gidişine göre anlıyorsun yani… Burada havuz merdivenlere, Kütüphane'ye geldim diyor. O sürekli çalışıyor orda, devamlı kışın da. (User B-8)

Çarşıya gidip yemeğini kendin alsan çok daha hızlı olur ama sipariş vermeyi tercih ediyorum. Çünkü (Çarşı) çok karışık, çok kalabalık… İnsan kalabalığı olduğu için sesleri falan da ayırt etmek zor oluyor yönlenmek için. Ses, binanın yakınında olduğunuzu haber veriyor fakat çok sesli bir yerde, bastonun sesi duyulmuyor. Kalabalık olunca illa ki birilerine çarpıyorsun… Karşıdan gelen insan da görmeyince bastona basabiliyor. Sıkıntı oluyor o zaman. (User B-1)

…….

Aşağıdaki kaldırımın üzerinde ağaçlar var. Onlar çok sıkıntı oluyor, zor geçiyorsun. O yüzden ben o kaldırımı kullanmıyorum. Kaldırımın yanından devam ederim, yoldan, böyle. (User B-1)

Hızlı gitmek zorunda olduğum zaman derse yetişmek zorunda olduğum zaman kaldırımı (üzerinde ağaçların olduğu) pek tercih etmiyorum. Yoldaki o sarı çizgiler o zaman çok işe yarıyor. Sarı şeridin olduğu yere arabalar gelmiyor. (User B-2)

Kaldırımın üstünde ağaçlar var ya. Orada biraz sıkıntı yaratabiliyor. Baston dokunuyor, dokununca sağından ya da solundan geçiyorum. Nere müsaitse deniyorum. Bazen şeridi kaydırıp sağa ya da sola şey yapıp, ağaca çarpabiliyorum. Bu yüzden kafamı tutuyorum. Bir elim hep böyle tetiktedir. Bastonla birlikte diğer elimle paket taşımamaya dikkat ediyorum. (User B-3)

Ağaçları renklerinden fark ediyorum orada farklı bir renk oluyor ya zeminde topraktan dolayı. Tabi ki kaldırımı küçültüyorlar. (User B-4)
Kaldırım ortasındaki ağaçlar herkes için sıkıntı aslında çocuk arabasıyla yürüyenler için 2 arkadaş yan yana gittiği zaman öyle. Ayrıca ağaç dipleri açıkta olduğu için insanın ayağı giriyor tabi. (User B-5)
Mesela ben kenardan gitsem daha çok hoşuma gider. Oralarda çöpler falan şey oluyor. Ayağım çarptığında yazın açık ayakkabıyla kötü oluyor yani. Çöplerin yerleri kötü bence. Buradan gidersem mutlaka köşede.. dibi taş uçmasın diye mi. Yerleri de çok sabit değil ya. Yerleri sabit olsa yer gösterici olarak iyi olur. Renkleri biraz farklı renkte boyansa o da güzel bir şey olur… Bu çalılar da yola taşanlar kesilse.. çiziyor. Hayatımda başıma gelen en büyük kaza bir çalıdan dolayı geldi. Bir çalı işte orada böyle sadece göz bebeklerime girdi ikisine birden. Ne kapağına ne burnuma direk gözbebeklerime istesen denk getiremezsin. (User B-8)

Spatial Layout

…….
Kullandığım yerlerle ilgili kafamda bir 'cognitive map' gibi bir şey oluyor. Sağ sol falan gibi. Gide gele o şekilde olduğunu birileriyle netleştiriyorsun. (User B-3)
Ayrıntı göremiyorum. ODTÜ'deki yerini biliyorum o kadar. Binanın ayrıntılarını tanımam yani. Atıyorum şimdi 5. Yurda götürebilirim sizi. 5. Yurdun yerini, konumunu biliyorum çünkü. Ben yürürken çok dikkatli yürürüm, yerlerin konumuna, gittiğimiz yere, hangi sokaklardan girdik dikkat ederek. Kafamda yerleşkedeki yerleri oluşuyor. Ya da bazen işaretler koyuyorum… Kapısının nerede olduğunu bileyim. Kapısında merdiven var mıydı yok muydu bileyim. Bazen çalılıklara daldığım oluyor; bazen kötü yollara daldığım oluyor. Daha rahatı varken onu bilemiyorum. Ama bildikten sonra çok rahat giderim. Hatta çok da güzel tarif ederim orayı, dikkatli olduğum için. İşaretler koyarım mesela. Kafamda yürürüm o yolu anlatırken. Kafamda o yolu hayal ederim. Sağa dönünce, şunu görürsün, onu görünce sağa dön ve şunu görene kadar git gibi. (User B-4)
Birisinden destek istemektense bildiğim yerden gidince daha kolay buluyorum. Kampüsün şöyle bir rahatlığı oluyor. Insanlar Kızılay'da (Kent Merkezi) mesela üstüne üstüne yürüyor. Mutlaka birisi gelir yardım etmek ister bir de tutar 'içi rahat etmiyor' diye gideceğim yere kadar götürür. Ama ODTÜ'de insanlar üstüme üstüme gelmez. İhtiyacım olduğunda yanımda olurlar. Daha rahat o anlamda benim için. Buranın bu haliyle korunuyor olması benim için bireysel olarak önemli. (User B-5)
Yurda yerleşmiştim. Ailem dışarıdan geliyordu. Onlarla böyle 1 hafta falan gezdik. Öğrendim yani. Tek başına olsan zaten daha kolay oluyor tanıma süreci. Ondan sonra sıkıntı yaşadım, yani hatırlıyorum. Uzak bir yer; 'neresiydi?' hatırlamıyorum. Ringden indim, oradan gelirken sıkıntı yaşamıştım. Biraz da benim sorunum. Çevreyi göremediğim için. Binaları

ağaçları falan görebiliyorum sıkıntı yok! Ama şöyle bir sorun var: Uzaklaştıkça görüntü bulanıklaşıyor ve küçülüyor. Neye benzediğini göremem- mesela hangi bina? Yazıları da çok yakınlaşınca okuyabiliyorum… Hiçbir binanın şekli hiçbirşey olduğunu söylemiyor burada. Cam yüzey biraz hissediliyor da (parladığı ve ışık yansıması olduğu zaman)... Ben harita üzerinde biliyorum o işe yarıyor. İlk geldiğimde sormuştum burası Kütüphane demişlerdi öyle öğrenmiştim… Dar bir yolda dönüşleri görmek daha kolay. Geniş bir yolda nerden yol gidiyor nereye döneceksin o daha zor... Ama alan geniş olduğu için görüyorum birçok şeyi (Alle'de). Dediğim 'renk' olsa her şey çok daha kolay olacak benim için. Ya da bahsettiğim insanın gözüne girebileceği dallar olmasa daha iyi olur. (User B-7)

…….

Devrim'in (Devrim Yolu) orası daha düz oluyor, ben oradan gidiyorum. Şimdi bir de yol tarafında arabalar geçiyor ya, çok ses oluyor… Açıkçası her türlü işareti kullanmanız gerekiyor. Çünkü başka türlü gidiş imkanı yok. Bu (mazgal) işaret mesela. Demir, deliği büyük olmadığı sürece baston girmez. Baston girerse sıkıntı oluşturur tabi (baston dirsek atabilir). Bu (merdivenin kenarındaki taş çiçeklik) da mesela (işaret). (User B-1)

…….

Şurada bir yerde bir düz alan var. Bunu tercih ediyorum yürümek için, daha kolay oluyor. Merdiven! Bu da benim Çatı'ya (Çatı Cafe'ye) yaklaştığımı işaret ediyor… Buradan mesela 1, 2, 3 merdiven inince, Kütüphane'ye varacağımı biliyorum… Tabi su sesleri! İşte böyle işaret oluyor benim için. Bunlar baya önemli. Ses benim için çok önemli! Herhâlde tahmin ediyorum tüm görme engelliler için de önemlidir. Benim için ayrı öneme sahip. (User B-3)

Bu ana geliş yolundan (Alle'den) herkesin geldiği, çok ara yolları kullanmadan arnavut kaldırımı olan yoldan devam ediyordum. Burası rahat, buranın merdivenini (Alle üzerinde Mimarlık Bölümü girişi hizasındaki) bulduktan sonra arnavut kaldırımlar arasındaki düz çizgi var ya o rahat benim için… Bir de buradan gidince direk merdivene gideceğimi biliyorum… Belli şeyleri biliyorsun mesela bir sonraki merdivenin dibinden yakınından bir yerden sağa dönersin orada bir yol vardır öyle gidersin Mimarlık'a. Yani aslında burada genel olarak bu düz taşlar ve merdiven saymak işime yarıyor bir yere giderken… İktisat'ın yoluna geldik. 'Nereden tanıyorum?' Bu taşlardan! Burada tahmini olarak girişe doğru gidiyorum. Bir işaret yok aslında. Tamam burası (merdivene geldik) bizim bölümün çıkışı burden, artık gidiyordum… Kütüphane'nin önündeki basamak var (işaret olarak aldığı). Oraya geldiğin zaman, Kütüphane'ye geldiğini anlıyorsun. Havuzlar var. Küçük su havuzları. Eğer suları açıksa. Sabit şeyleri işaret almaya çalışıyordum. Genelde de öyle yaparım. (User B-5)

(Alle'de) Dümdüz gidiyoruz sonuçta biraz sağa sola kaysak da. Ama buradayız sonuçta. Alle benim için sorun değil. Giriş, çıkışmış. Merdivenmiş. Düzensiz olmadıkça önemli değil. Ama tekerlekli sandalyeli için buralar tırtır tırtır kötü

yani. (Biraz duraksadı) Orada banklar var… Buralarda birşeyler olduğunu farkediyorum. Senle konuşunca çok da dikkat etmiyorum. Ne bileyim yanımda biri var diye, ya da konuştuğumdan belki. Bu şeyler (zemindeki düz hatlar) beni dümdüz götürmek için faydalı olabilir. Ağaçlara denk geldik. (Düz hattan kaymak gerekiyor) bazen girişleri tam tutturamıyorum, Çatı (Café), Fizik, Beşeri (Bilimler)… Bu merdivenlerin de sırası önemli, 'Kimya'yı geçtim MM'e (Merkez Mühendislik Binası) geliyorum gibi', benim için yönlendirici oluyor… Bir yerlere geldiğimde tam olarak nereye döneceğimi bilmek isterim. Yoksa şey olarak biliyorum 'Beşeri tam solumda kaldı' diye. Ama tam girişini yakalamak problem. Mimarlığın girişini yakalamak hiç problem değil çünkü havuz var! (User B-8)

…….

Mesela insanlar genelde kenara yaklaşma falan derler ama benim için kenarlar iyi. Ben takip ederim. O yüzden kaldırım olduğu zaman kaldırım kenarlarından yürümeyi severim. Asla da bir kere bile düşmedim düşülmez öyle kolay kolay da, kenarlar çok yönlendirici benim için… En çok nerede yön bulmak daha kolay. Kaldırımda tabiki. Kaldırım dümdüz ve belli gidiş yeri. Ama alle çok geniş sağa sola biraz kıvrılan daha rahat bir ortam olduğun için. Düşün bir yolda mı kaybolursun bir ormanda mı? Düşün ki hiç bina olmasa kütüphaneye geldik diye. Ama onlar hiç olmasa sadece allede yürüsen. Nerdesin napıyorsun bilir misin zorlanırsın? (User B-8)

…….

Burada biraz ilerledikten sonra bizim bölüme gitmek için hafiften sola kıvrılmak, çaprazlamak gerekiyor. Birkaç sefer ben zor bulmuştum. Burada herhangi bir işaret yok ama yavaş yavaş anlıyorsunuz, alışıyorsunuz… İşte buradaki çöp kutusunu buluyorsunuz. Bu şekilde girişe doğru ilerleyebiliyorsunuz. (User B-1)

Önümde engel olmayacağımı bildiğim yerlerde en çok kenarları takip etmeyi seviyorum... Toprakla veya kaldırımla kesiştiği yerleri takip etmek direk gitmeyi kolaylaştırıyor… Şimdi Beşeri'ye gitmek için buradan geliyordum. Kenarı bulmalıyım ki oraya geldiğimi anlamalıyım. Toprakla bitiştiği yeri bulmalıyım ki. Buradaki çöp kovası mesela o zaman da vardı! Buradan çaprazlama gideceğimi biliyorum; ama şuradaki toprağı takip ederek yolu bulmam gerekiyor. Becerebilirsem! Beceremezsem kayboluyorum… Yani böyle yeri değişebilen çöp kovası gibi şeyleri işaret olarak almamaya çalışıyorum. Ama ODTÜ kampüsü gibi yerler aslında onların da çoğunlukla yeri değişmiyor, bu iyi bir şey. (User B-5)

5.4.2.2 Approaching outdoor spaces and buildings

…….

Orda (kaldırım üzerinde binanın girişine dönüş) da işaret olsa aslında, maalesef o yok işte. Yani ODTÜ'de şu karşıdan karşıya geçme, bir takım yerlerde işaret olma durumunu aşarsak eğer benim için hayat tam anlamıyla bayram olacak. Zorlanıyorum karşıdan karşıya geçerken bunu inkar edemem. Şikayetçi miyim

değilim. Ben yavaş gelişen bir insanım aslında. Benim bu aşamaya gelmem bile benim için büyük bir adım. (User B-3)

…….

Şuradan devam ettiğimizde biraz yüksek bir kaldırımımız ve biraz yamuk bir basamağımız var. Yamuk basamakları sevmiyorum çünkü düz gidemiyoruz. Kenara gelince düşebiliriz. Pek güvenli değil! Bir taraftan da sıkıntı yaratan şey bana işaret olabiliyor. Başka bölümlerde de var ama bu yamuk basamak bizim bölümün simgesi! O basamakları görmediğim zaman ha tamam bizim bölüme gelmedim diyebiliyorum. Güvenlik sıkıntısı yaratan şey bir de işaret oluşturabiliyor. (User B-3)

Bu benim için çok önemli bir yer böyle bir platform olması benim için çok iyi. 'Kütüphaneye geldin' diyor, 'ortadasın, merkezdesin' diyor. Ama şimdi şeye bak: Bölümün (Beşeri Bilimler) girişini bulmakta zorluk yaşıyorum. Acaba adım mı saysam diye düşündüm, hiç yapmadığım bir şey sevmem de. Bölümün girişini kaçırıyorum bazen. Şimdi ışık iyi olduğu için kaçırmayabilirim. Ama ona da belirteç bir şey bulmalıyım. Bazen kaçırıyorum. Mimarlığa giden merdivene geldiğimde geri dönüp buluyorum. O kadar kolay değil burayı bulmak. Bir basamak çıkıyorum buraya gelince bölüme doğru gittiğimi biliyorum. (User B-8)

…….

Taşın rengi gri olduğu için- yani ışık vurunca anlıyorum burayı. Ya da daha kalabalık dönemlerde sürekli insanlar geçtiği için 'ha merdiven buradaymış' diyorsunuz. (User B-1)

(Merdivenden indik) 3, 4 adım sonra Kütüphane'deyiz zaten. Hah bu bizim kaldırımımız (kütüphane giriş platformu)! Havuz sesi! Sonra şu mazgallar. Rahatlatıcı bir unsur olabiliyor. (User B-3)

Beşeri'nin (Beşeri Bilimler) girişindeki yükselti beşeriye geldiğime işaret eder benim için, sonra yamuk merdivenler… Yamukluktan dolayı bir sıkıntı yaşamadım burada ama boşluğa düşme durumu yaşanabilecek bir durum. (User B-5)

…….

Girişte yerdeki paspastan kapıya (Kütüphane'nin giriş kapısına) yaklaştığımı biliyorum. Bir de buranın kapısı bazen kapalı olabiliyor. Burada heykel var. Sağ yapmak gerekiyor. (User B-1)

(Beşeri Bilimler bina girişine yönelirken) Burada bir paspas ya da mazgal olması gerek onu buluyorum. Bir de daha kapalı bir mekâna geldiğimiz belli. (User B-5)

…….

İnşaat Mühendisliği'ne gitmek gayet kolay. O da şöyle kolay; ilerde hem zemin geçit (kaldırım rampası) var. Oraya geldiğim zaman direk karşıya geçiyorum. Biraz soldan devam ettiğim zaman inşaata gidiyorum. (User B-1)

Bu tümsek yurda yaklaşıyorum işareti (otoparka giriş için yol ayrımı). Birazdan karşıya geçmemiz gerekebilir… Mesela şurada bir iniş çıkış var. Burası 4. Yurda giden yol. Bir tane daha gidiyorsun 3 sonra 1 var. (User B-3)

5.4.2.3 Spatial use in consideration of participation in campus life

…….

Bildiğin yerde çok hızlı ve daha bi güvenerek gidiyorsunuz. Bilmediğiniz zaman, daha kontrollü ve yavaş gidiyorsunuz. Etrafına avanak bir hava veriyorsunuz. Birisi yardıma ihtiyacın var mı diye geliyor öyle olunca. (User B-1)

…….

Bildiğim bir yerse biliyorsam çook rahat giderim. Eğer bilmiyorsam çok tedirgin olurum etrafında dolanırım giriş kapısını bulamam çok zorlanırım. Bir kere gitmem lazım tek başıma olunca biraz zorlanırım ama keşfetmeye yeter. (User B-4)

Gideceğim yer bilmediğim bir yerse, korkutur ve eğer yanımdan birisi yoksa gitmeme engel olabilir. Bu da benim birazcık eksi tarafım heralde. Bildiğim alanları tercih ediyorum. Yeni şeylere de açığım fakat sıkıntı yaşadığımda yardım alamayacağım uzaklıktaki şeylerden kaçınırım. (User B-3)

…….

İlk tanıma döneminde arkadaşlarımla, kendim de gezdim. Kaybolduğum da oldu ama insanlar iyidir yani, sormaktan çekinmem. Hala yaptığım bir şey burdan buraya nasıl giderim diye tarif alıyorum. Biri bana tarif edince bazen daha iyi anlıyorum hatta, beynimde resim oluşuyor. Benim için resimler önemli… Ama hani bu harita bende olsaydı daha iyi olurdu. Mesela kabartma şimdi yapabiliriz senle. Yumuşak bir ortam bir kağıt bir kalem. Bacağımızı kullanarak yapabiliriz. Öyle çok pahalı şeylere gerek yok. (User B-8)

…….

Hani şuraya gel dediklerinde uzak bir yere. Eskiden çok tereddüt ederdim. Gitmeyi bilmediğim yerlere aslında genel olarak şu gelişti bende 7 yıl içinde: bilmediğim bir yere gitmekte daha cesurum eskisine göre. O kadar tereddüt ederdim ki bir yere gitmekte eğer gitmediğim bir yerse. Tanımakta güçlük çekeceğime dair güçlü bir özgüvensizliğim vardı. Ama onu çözdüm yani. Bireysel özgüvenin gelişmesinde aslında ailemden uzakta ve burada yalnız yaşamam etken… Kampüste her yere gidiyorum şimdi, ama zamanla oldu. Alan gitgide genişledi yani. Ha burada bir yol varmış, keşfediyorum falan, öğrendikten sonra kullanıyorum. Yeni bir yol denediğimde çıkacağım yeri muhtemelen biliyorumdur onun verdiği özgüven var. Hiç bilmediğim bir yerde olmaktan farklı. (User B-7)

Participation in social & leisure activities

…….

Çimlerde otururduk çok. Arkadaşlarla falan vakit geçirirken yaptığım şey oydu aslında. Benim vaktim de çok yoktu aslında. Dersleri falan ancak yetiştiriyordum. İlk sene repeat oldum. Sonra çok çalıştım yine zamanında bitirdim… Bir insan 1 saat çalışıyorsa benim 5 saat çalışmam gerekiyordu. Çok

fazla bir şey de yaşayamadım aslında ODTÜ'de sosyal olarak. Bir yaptığım şey yüzmekti havuzda. (User B-4)

Sağdan soldan görünmeyen gidip bilgisayarımla bir şey okumak için sessiz sakin yerleri seviyorum. Iktisatın arkası (dış mekân) o yönden iyi. Alle yine de bana çok zor gelmiyor ama oraya giriş mesela zor oluyor biraz. (User B-8)

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2014	Dinç Uyaroğlu, İ. "*Accessibility Planning for Equitable Access in University Campuses [Üniversite Yerleşkelerinde Eşit Katılım için Erişebilirlik Planlaması]*". In Proceedings of International City and Disability Symposium [Uluslararası Kent ve Engelliler Çalıştayı], April 18-21, 2014, Yüzüncü Yıl University, Van, Turkey.

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2006 Vehbi Koç and Ankara Research Center (VEKAM), "The Center of Ankara: Ulus", June, 2006, VEKAM, Ankara, Turkey.

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