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An Investigation of the Surrounding Environments of Selected High School Buildings in Ankara with Regard to Turkish Standards Related With Accessibility

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ABSTRACT

The main problem in this study is to create "as normal as possible" life opportunities for people with disabilities. The physical and social barriers that prevent their access to the social life and the provision of conditions for employment can only be achieved by ensuring the architectural designing of the buildings and their surrounding environments regarding the accessibility standards. Accessibility may be considered as "necessary" in private properties and is important that all houses and residential areas are accessible to people with disabilities. When it comes to services provided by the government in public buildings and public spaces, it must be considered as an "obligation" to be fully accessible. In this study as an important part of public space three public education buildings where students with special needs are educated in Ankara. Sincan Vocational and Technical High School **(Example 1),** Dikmen Nevzat Ayaz Vocational and Technical High School **(Example 2),** and Dikmen Vocational and Technical High School **(Example 3)** and their surrounding environments were evaluated by forms prepared regarding Turkish Standards TS 9111 (2011), TS 12576 (2012), related with accessibility using observation and analysis techniques based on the data collection method. The evaluation method used in this study relies on how much an existing condition of selected buildings exceed the optimal state of a fully accessible situation. This is done by determining the Accessibility Value Exceeding Coefficient (A.V. Ex. C.). In order to achieve this, the General Accessibility Value (G.A.V) of a building must be divided in to the Sum of Answered Questions. (S.A.Q). As a result of evaluations of the existing condition of these buildings and their surrounding environments, primary problems and proposals for solutions to these problems were determined. With these solutions proposed, a more accessible public space can be achieved for the most adversely affected disabled population including the physically disabled, visually impaired and hearing-impaired groups

Key Words: Accessibility, High School Buildings, Public Space

1. INTRODUCTION

All disabled individuals, have a right to live a complete life that facilitate under conditions which ensure their dignity, promote their self-reliance and effective participation to social life[1].

According to the Universal Declaration of Human Rights everyone has a right to have education. Also according to the United Nations children's rights convention Article 23, Turkey has accepted the will guarantee the rights of children with special educational needs. According to this out country has accepted that all physically and mentally disabled children should

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have satisfying complete life as described above. Also according to the Article 42 of the Turkish Constitution, *'No one can be deprived of their right of education and training'*. Accordingly, the right to education is a right guaranteed to all citizens by the Constitution of Turkey [2].

As long as the core of the design is people, the buildings should continue to meet people's expectations. User definition covers everyone without discrimination including physically disabled people, the elderly, children, pregnant women, very long and very short people and people carrying loads. In order to create "as normal as possible" life opportunities for people with disabilities, the physical and social barriers that prevent their access to the social life and the provision of conditions for employment can only be achieved by ensuring the architectural designing of the buildings and their surrounding physical environments regarding the accessibility standards.

In Turkey According to the law no: 5378 "Law about the Disabled" all public buildings and institutions were to be made suitable for disabled accessibility until 2012 [3]. The deadline was then revised in 2012 to July 2015. The referred public buildings and institutions include educational facilities in Turkey. The renovation of these buildings is an important aspect in the goal of achieving a "barrier-free Turkey". The determination of the rate of implementation of these standards in the physical built environments is necessary. There is a need for an evaluation method in order to determine the existing condition of these buildings and their surrounding physical environments.

This article was prepared from the ongoing M.S. Thesis "The investigation of High School education buildings and the environments in context of Turkish Standards related with accessibility" (Gazi University Graduate School of Natural and Applied Sciences, Program of Architecture, M.S. Thesis) [4].

In this study, the Turkish Standards related with accessibility such as TS 9111 (2011), TS 12576 (2012), TS ISO 23599 and TS 13536 are regarded as the model structure representing the evaluation criteria for accessibility. Limitations of this study consist of the most adversely affected disabled population including the physically disabled, visually impaired and hearing-impaired groups. Other groups of disabled people according to the definitions, such as mentally disabled, disabled with chronic illness, speech and language disabilities, mental and emotional disabilities were not included in this evaluation.

As an application of the universal design principle that emphasize on the differences of the abilities of the people with disabilities, all buildings and their surrounding physical environments should allow users to have education, be employed and participate in public duties and social activities. In evaluation of the buildings selected in this study , instead of providing specialized areas accessible to certain users, all of the building areas were evaluated to be accessible to all of the users whether the person is a receiver or a provider of the services offered in the building.

In Turkey the evaluation criteria for accessibility are accepted as the Turkish Standards related with accessibility such as TS 9111 (2011), TS 12576 (2012), TS ISO 23599 and TS 13536. Not all of the standards were evaluated in the study but the articles related with the existing spaces of the selected building were selected and observations were made at the existing buildings and their surrounding environments.

Accessibility may be considered as "necessary" in private properties and is important that all houses and residential areas are accessible to people with disabilities. But when it comes to services provided by the government in public buildings and public spaces, it must be considered as an "obligation" to be fully accessible. In the design of public buildings and public spaces, the need for full and equal enjoyment of fundamental freedoms, of the people with disabilities must be taken into consideration.

The concept of Public Space were investigated in the 1960's in Europe and is yet to be defined definitely up to this day. The Meaning of public space is open to different perspectives and achieves altering meanings. According to Kostof, public areas are open to everyone, easily accessible for daily routines or festivals, periodic event such as celebrations and bring together all kinds of classes and cultures where the boundaries are not defined and belong directly to the community [5]. Habermas defines public space as a "Concept" in modern social theories that is used to define the social activity areas where the production and development of the discourse and action is made for the identification and realization of the common good of society [6].

In this study, streets, pavements, parks pedestrian crossings and city squares are defined as open public spaces and buildings like the state ministry, governorship, municipalities, schools, public buildings such as hospitals and courthouses are also defined as public buildings where the public interest and services are provided.

The point of view of the disabled people to the subject can be derived from the "The research on Problems and expectations of the Disabled" in June 2010. In this research the (former) Disability Administration conducted a survey on the National Disability Database was used for the registered disabled people and collected data on their daily routines, problems and expectations in order to establish policies in this area effectively [7].

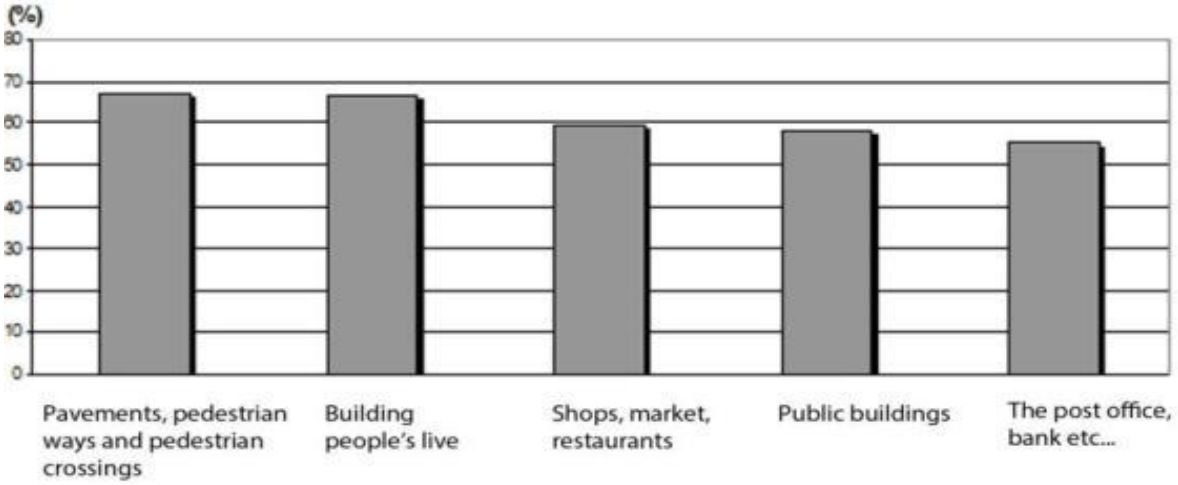

Figure 1 those who think that the physical environments of public spaces are not appropriate for usage by people with disabilities (2010) [7].

According to figure 1 of the survey report, 66.9% of the registered people with disabilities, think that pavements, pedestrian ways and pedestrian crossings are not appropriate for usage by people with disabilities. As an answer to a related question about the physical environment they live in, 66.3% of the people involved think that the building they live in is not appropriate for usage by disabled people. 59.5% of the people involved think that the shops, market, restaurants they use are not appropriate for usage by disabled people. 58.4% of the people involved think that the public buildings they visit use are not appropriate for usage by disabled people. 55.4% of the people involved think that the post Office, bank etc... Buildings are not appropriate for usage by disabled people [7].

This research shows that the existing physical environments and the buildings people use every day are not mainly considered as accessible to people with disabilities.

2. METHODOLOGY

This study aims to provide an evaluation method in order to determine the existing condition of buildings and their surrounding physical environments.

The method is collection of data through investigation, observation and evaluation of the physical environment in the selected high school buildings in Ankara with regard to evaluation forms based on the Turkish Standards TS 9111 (2011), TS 12576 (2012), related with accessibility. The data received from these forms has been the main base of evaluation of these public spaces and the source of the results and proposals for solutions to the problems observed regarding the accessibility of disabled people and people with mobility constraints.

The attempt to prove the lack of accessibility, in the selected environments, is a feature that all physical environments should have in order to achieve full participation to public and social activities and achieve the right of education and citizenship rights of the people with disabilities.

In this study, to assess the accessibility of the physical built environment, high school building and their surrounding environments which take a considerable portion in public buildings were chosen. In many of the public building in Turkey, lack of accessibility of the disabled people is very significant as it is also highly significant in educational buildings.

In Turkey, it is aimed to benefit from vocational and technical training experience in Europe, following good examples in high school education to provide sustainable employment to students, giving everybody a basis of equal opportunity and rights. As a result of changes in the scope of laws and "4+4+4" system made since March 2012, by the Ministry of Education, the compulsory education now includes the high school level. Due to such changes, more young people with special educational needs will take place in the education system for longer periods of time and such individuals can have more jobs and higher education opportunities. This will also disclose a higher need for schools offering quality education.

As a part of the integration process with the European Union, disabled students are directed to vocational and technical high schools by The Ministry of Education. With this it is intended to improve employment opportunities more quickly and easily.

In this Study, high school buildings and surrounding physical environments that are used by the audience of young people aged 15-19 living in Turkey, are

designated as the study area. The sample set is selected as the vocational and technical education high school buildings.

After an exchange of ideas with the Special Education Department of the Ministry of Education, a special project named "Special Education Empowerment Project" (ÖZEGEP) was considered as a perfect setting for this research. Eight pilot schools in mainstream education were selected at the secondary education level to run these projects, in the 2012/2013 academic year in Ankara. These selected schools give different educations on varying vocational and technical education areas. This variation forces the functional usage of the spaces in different manners.

In this study, Sincan Vocational and Technical High School **(Example 1),** DikmenNevzat Ayaz Vocational and Technical High School **(Example 2),** and Dikmen Vocational and Technical High School **(Example 3),** were selected as sample projects. (Figure2, 8 and 13)It is intended to evaluate each selected building and its surrounding environments in its own context and offer solutions to the deficiencies identified via the evaluations forms formed from the Turkish Standards related with accessibility.

In this study it is not intended to comparatively evaluate all selected buildings. Also the aim of this study in not to blame or criticize the mangers or the institutions but to offer solutions and determine the necessary renovations, design alterations and adding of instruments to the evaluated building regarding the Turkish Standards related with accessibility.

As a method of evaluation each building and its surrounding environments, are questioned and observed via forms prepared from the Turkish Standards TS 9111 (2011), TS 12576 (2012), related with accessibility. The Accessibility Value (A.V.) of each form will be determined and will be evaluated via the answers received. The answers to the questions are classified as follows.

For every question asked about an existing condition mentioned in TS 9111 (2011) and TS 12576 (2012), there were 4 types of answers. "FULLY COMPATIBLE" answer represents a situation where the existing condition is compliant with the related article of the related Turkish Standard and its A.V. is 1. "INVALID" answer represents a situation where the question cannot be answered and this does not form an accessibility restraint to the environment and its A.V. is 0. This question is considered not answered. "FULLY INCOMPATIBLE" answer represents a situation where the existing condition is non-compliant with the related article of the related Turkish Standard and it's A.V. is 5, "INAPPLICABLE" answer represents a situation where the question cannot be answered and this forms and accessibility restraint to the environment and it's A.V. is 3 is lower than 5 and higher then 1. The This General Accessibility Value (G.A.V) of a building is determined by adding the sum of all A.V. of each forms.

In this Study the evaluation method relies on how much an existing condition of selected buildings exceed the optimal state of a fully accessible situation. This is done by determining the Accessibility Value Exceeding Coefficient (A.V.Ex.C). In order to achieve this, the General Accessibility Value (G.A.V) of a building must be divided in to the Sum of Answered Questions. (S.A.Q)

A.V.Ex.C (of a form/activity area or a building as a whole) = A.V / S.A.Q

For Example; When evaluating the existing condition, in the condition where all the answers to answered questions are "FULLY COMPATIBLE" the average of A.V.'s of forms and thus all building; which is defined as Accessibility Value Exceeding Coefficient (A.V.Ex.C) will be 1. This will represent that the building is fully accessible.

In the condition where some of the answers give a value higher than 1,it would raise the A.V.'s of forms and thus the buildings. This will raise the Accessibility Value Exceeding Coefficient (A.V.Ex.C) over the value of 1. The amount of exceeding on the value over 1 will represent how much each form thus the building exceeds the optimal accessible situation. The higher the ratio of the (A.V.Ex.C) to 1 the more un-accessible the building is.

This valuation of the answers to forms would then be used in evaluating and proposing of new refinements to the related areas in the buildings at the CONCLUSIONS section.

3. FIELD STUDY

In this study five of the evaluation forms will be used to observe the existing condition and the accessibility values of 3 high school buildings and their surrounding environments. Questions in the forms were prepared from the relevant Turkish Standards TS 9111 (2011), TS 12576 (2012), and sections. This Study took place between February 2015 and April 2015. All data from all answered questions were collected within this period of time. These forms and relevant sections are;

- Form 1: Urban Furniture; *TS 12576 Section 5.5 Urban Furniture*
- Form 2: Pedestrians crossings; *TS 12576 Section 5.4 Pedestrians crossings*
- Form 3: Bus Stops ; *TS 12576 Section 5.8 Bus Stops*
- Form 4: Accessible Route; *TS 12576 Section 5.1 Pavements, Section 5.2. Ramps, Section 5.3 Outer Stairs, TS 9111 Section 4.3 Accessible Route, Section 4.4.2 Pedestrian Roads, Section 4.4.3 Ramps, Section 4.7.1.1.3*

Railings, Section 4.11.1 Rules regarding surrounding environments of existing buildings.

- Form 5: Car Parks; *TS 12576 Section 5.7 Vehicle parking spaces for the handicapped,, TS 9111 Section 4.4.1 Car parks*

  As a result of the questions asked in these forms and Accessibility Value (A.V.) for every activity area was formed. The A.V of each form of each activity area is then divided by the Sum of Answered Questions (S.A.Q) to form the Accessibility Value Exceeding Coefficient (A.V. Ex .C.) of the form and the related activity areas. This is then used to evaluate the existing condition and propose solutions to observed problems at each form and the related activity areas separately.

The sum of all the A.V's were the General Accessibility Value (G.A.V.) of the selected buildings' surrounding environment. The G.A.V of every building is then divided by the Sum of Answered Questions (S.A.Q) to form the Accessibility Value Exceeding Coefficient (A.V. Ex. C.) of the building and the surrounding environment in total. This is then used to evaluate the existing condition and propose solutions to observed problems at each building and the surrounding environments as a whole.

Sincan Vocational and Technical High School (Example 1)

Figure 2 Sincan Vocational and Technical High School (Example 1)

Sincan İMKB Vocational and Technical High School (Example 1) FORMS & PLACES			FORMS						
			TOTAL NUMBER OF ANSWER	19 URBAN FURNITURE	41 PEDESTRIAN CROSSINGS	24 BUS STOPS	124 ACCESSIBLE ROUTE	20 CAR PARK	Accessibility Value of Activity Area	Accessibility Value Exceeding Coefficient of the Activity Area
				FORM 1	FORM 2	FORM 3	FORM 4	FORM 5		
PLACES	Buildings surrounding environments	BUS STATION	24			***82***			**82**	**3,42**
		PATHWAY	124				***364***		**364**	**2,94**
		PEDESTRIAN CROSSING	41		***121***				**121**	**2,95**
		SCHOOL GARDEN	143	***53***			***364***		**417**	**2,92**
		CAR PARK	20					***74***	**74**	**3,70**
		OUTDOOR SPORTS GROUNDS	124				***364***		**364**	**2,94**
TOTAL NUMBER OF ANSWER			476	19	41	24	372	20	**1422**	**3,14**
Accessibility Value of the form				**53**	**121**	**82**	**1092**	**74**	**1422**	
Accessibility Value Exceeding Coefficient of the form				**2,79**	**2,95**	**3,42**	**2,94**	**3,7**	**3,16**	

Table 1 Forms of accessibility value of Example 1

The results and evaluations derived from the answers to the questions in the forms are as follows as;

FORM 1	**Sincan İMKB Vocational and Technical High School (Example 1)**

Question	**A.V.EX.C.**	**2,79**	**FORM A.V.**	**53**
20				
Answer	FULL COMPETIBLE	INVALID	FULL INCOMPETIBLE	INAPPLICABLE
19	**10** 52,63%	**1** 0%	**8** 42,10%	**1** 5,26%

Table 2 Form of Urban Furniture A.V. of Example 1

- ***Form 1: Urban Furniture of Example 1,*** No urban furniture was used on route to the building. Along with that the obstacles throughout the route was not signed properly. On the school site there are accessibility problems to recreational areas and no means of perceivable signage along the route for the visually impaired. Deformed materials and furniture poses thereat to people with mobility restraints and visually impaired as shown in figure 3.

Figure 3 Urban Furniture of Example 1(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 2	Sincan İMKB Vocational and Technical High School (Example 1)

Question	A.V.EX.C.		2,95		FORM A.V.		121	
44								
Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
41	**14**	34,14%	**3**	0%	13	31,70%	**14**	34,14%

Table 3Form of Pedestrian Crossings A.V. of Example 1

- ***Form2: Pedestrian Crossings of Example 1,***has some problems such as, the 1.degree road side there is no pedestrian crossing waiting area as required in relevant standard. Also there is no audio visual signage on the traffic lighting fixture to allow controlled crossing for all kinds of disabled people. There is an inadequacy in measurements of the pedestrian crossings as shown in figure 4.

Figure 4 Pedestrian Crossings of Example 1(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 3	Sincan İMKB Vocational and Technical High School (Example 1)

Question	A.V.EX.C.		3,42		FORM A.V.		82	
24								
Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
24	**6**	25%	**0**	0%	**11**	45,83%	**7**	29,16%

Table 4Form of Urban Furniture A.V. of Example 1

- ***Form 3: Bus stops of Example 1 ,***has another significant problem apart from other buildings as the pavements are not at least 3 m wide around the bus stop and also there is no space available for a wheelchair user in the bus stop itself as shown in figure5.

Figure 5 Bus Stops of Example 1(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 4	Sincan İMKB Vocational and Technical High School (Example 1)

Question	A.V.EX.C.		2,94		FORM A.V.		364	
156								
Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
124	**51**	41,12%	**32**	0%	**47**	37,90%	**26**	20,96%

Table 5 Form of Accessible Route of Example 1

- ***Form 4: Accessible Route of Example 1,*** have a lack of resting areas at least 30 meters apart with in school site. Also there is no direct route to building entrances for disabled people marked with perceivable markings or even free of city traffic within the sites. Another problem is that there is no visual, audial or perceivable informative signage with the building sites that would orientate disabled people. The start and ending of the ramps and stairs within the sites are not marked with perceivable marking. The outer stairs and ramps are not protected against the atmospherically conditions and have problems of correct material usage. The uneven natures of pavements are also a problem for disabled people as shown in figure 6.

Figure 6 Accessible routes of Example 1(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 5	**Sincan İMKB Vocational and Technical High School (Example 1)**

Question	**A.V.EX.C.**	**3,7**	**FORM A.V.**	**74**
21				
Answer	FULL COMPETIBLE	INVALID	FULL INCOMPETIBLE	INAPPLICABLE
20	**1** 5%	**1** 0%	**8** 40%	**11** 55%

Table 7Car Parks of Example 1

- ***Form 5: Car Park: of Example 1,*** have no designated and signed spaces for the disabled peoples' vehicles as shown in figure 7. No means of accessibility was achieved in either building. Along with that there are no means of designated accessible route to building entrances covered form atmospherically conditions. The material usages are also not convenient. Example 1 has night time lighting.

Figure 7 Car Parks of Example 1(Photograph: Cansu DİŞYAPAR, April 2015)

Dikmen Nevzat Ayaz Vocational and Technical High School (Example 2)

Figure 8 Dikmen Nevzat Ayaz Vocational and Technical High School **(Example 2)**

Nevzat Ayaz Vocational and Technical High School (Example 2) **FORMS & PLACES**			**FORMS**						**Accessibility Value of Activity Area**	**Accessibility Value Exceeding Coefficient of the Activity Area**
			TOTAL NUMBER OF ANSWER	20 URBAN FURNITURE	43 PEDESTRIAN CROSSINGS	24 BUS STOPS	137 ACCESSIBLE ROUTE	21 CAR PARK		
				FORM 1	FORM 2	FORM 3	FORM 4	FORM 5		
PLACES	Buildings surrounding environments	BUS STATION	24			***76***			**76**	**3,17**
		PATHWAY	137				***463***		**463**	**3,38**
		PEDESTRIAN CROSSING	43		***157***				**157**	**3,65**
		SCHOOL GARDEN	157	***52***			***463***		**515**	**3,28**
		CAR PARK	21					***77***	**77**	**3,67**
TOTAL NUMBER OF ANSWER			382	20	43	24	274	21	**1288**	**3,43**
Accessibility Value of the form				**52**	**157**	**76**	**926**	**77**	**1288**	
Accessibility Value Exceeding Coefficient of the form				**2,60**	**3,65**	**3,17**	**3,38**	**3,67**	**3,29**	

Table 8 Forms of accessibility value of Example 2

The results and evaluations derived from the answers to the questions in the forms are as follows as;

FORM 1	Nevzat Ayaz Vocational and Technical High School (Example 2)

Question	A.V.EX.C.	2,6	FORM A.V.	52
20				
Answer	FULL COMPETIBLE	INVALID	FULL INCOMPETIBLE	INAPPLICABLE
20	**11** 55,00%	**0** 0%	**7** 35,00%	**2** 10,00%

Table 9 Form of Urban Furniture A.V. of Example 2

- ***Form 1: Urban Furniture of Example 2,*** No urban furniture was used on route to the building. On the school site the "Fully compatible" answers were high as of the nature of the furniture's, but there are accessibility problems to recreational areas and no means of perceivable signage along the route for the visually impaired as shown in figure 9.

Figure 9 Urban Furniture of Example 2 (Photograph: Cansu DİŞYAPAR, April 2015)

FORM 2	Nevzat Ayaz Vocational and Technical High School (Example 2)

Question	A.V. EX. C.	3,65	FORM A.V.	157
44				
Answer	FULL COMPETIBLE	INVALID	FULL INCOMPETIBLE	INAPPLICABLE
43	**10** 23,25%	**1** 0%	**24** 55,81%	**9** 20,93%

Table 10 Form of Urban Furniture A.V. of Example 2

- ***Form 2: Pedestrian Crossings of Example 2,*** there is no waiting area at the road side as required in relevant standard. Also there is no audio visual signage on the traffic lighting fixture to allow controlled crossing for all kinds of disabled people. Also there is as a lack of markings and signage of the pedestrian crossing.

Figure9 Pedestrian Crossings of Example 2(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 3	Nevzat Ayaz Vocational and Technical High School (Example 2)

Question	A.V.EX.C.	3,17	FORM A.V.	76
24				

Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
24	**8**	33,33%	**0**	0%	**10**	41,66%	**6**	25,00%

Table 11 Form of Pedestrian Crossings A.V. of Example 2

- ***Form 3: Bus stops of Example 2,*** have problems about signage of parking restrictions around bus stops. All bus stops are not signed on transparent surfaces to prevent visually impaired from crashing as required in the relevant standards. Along with that all bus stops have a lack of informative signage about the bus schedules and have lack of required furniture that are up to relevant standards as shown in figure10.

Figure 10 Bus Stops of Example 2(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 4	Nevzat Ayaz Vocational and Technical High School (Example 2)

Question	A.V. EX. C.	3,38	FORM A.V.	926
156				

Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
137	**37**	27,00%	**19**	0%	63	45,98%	**37**	27,00%

Table 12 Form of Accessible Route of Example 2

- ***Form 4: Accessible Route of Example 2,*** has some other problems apart from the above. There is not even one accessible route to building entrance around the site wide enough as required as relevant standards. The uneven state of pavements is also a significant problem. The high slopes around the site are not solved with accessible ramps and/or other means of accessibility features such as platform lifts. The pavements were not protected against car parking to allow an accessible route. There are no curb ramps. Outer stairs have no railings on both sides and are not wide as 180 cm at any point as shown in figure 11.

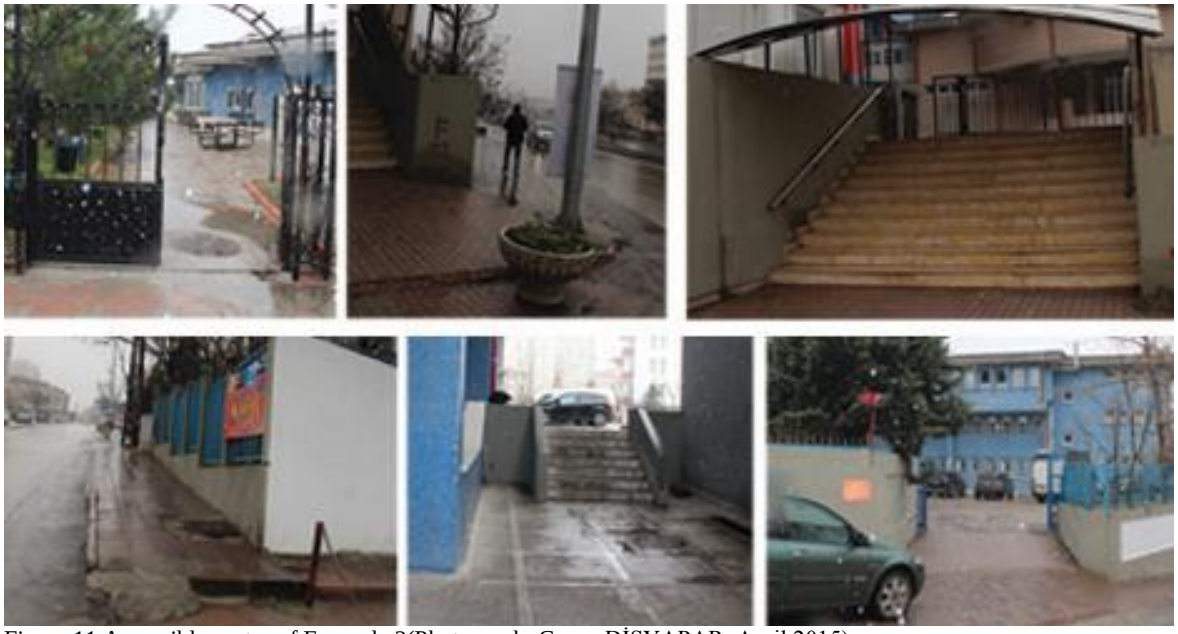

Figure 11 Accessible routes of Example 2(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 5	**Nevzat Ayaz Vocational and Technical High School (Example 2)**

Question	**A.V.EX.C.**		**3,67**		**FORM A.V.**		**77**	
21								
Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
21	**1**	4,76%	**0**	0%	**8**	38,09%	**12**	57,14%

Table 13Car Parks of Example 2

- ***Form 5: Car Park: of Example 2,*** have no designated and signed spaces for the disabled peoples' vehicles. No means of accessibility was achieved in either building. Along with that there are no means of designated accessible route to building entrances covered form atmospherically conditions. The material usages are also not convenient. Example 2 has night time light in.

Figure 12 Car Parks of Example 2(Photograph: Cansu DİŞYAPAR, April 2015)

Dikmen Vocational and Technical High School (Example 3)

Figure 13 Dikmen Vocational and Technical High School **(Example 3)**

Dikmen Vocational and Technical High School (Example 3) FORMS & PLACES			FORMS					Accessibility Value of Activity Area	Accessibility Value Exceeding Coefficient of the Activity Area
			TOTAL NUMBER OF ANSWER	19	40	24	144	21	
				FORM 1 URBAN FURNITURE	FORM 2 PEDESTRIAN CROSSINGS	FORM 3 BUS STOPS	FORM 4 ACCESSIBLE ROUTE	FORM 5 CAR PARK	
PLACES	Buildings surrounding environments	BUS STATION	24			***80***			**80**	**3,33**
		PATHWAY	144				***516***		**516**	**3,58**
		PEDESTRIAN CROSSING	40		***138***				**138**	**3,45**
		SCHOOL GARDEN	163	***49***			***516***		**565**	**3,47**
		CAR PARK	21					***81***	**81**	**3,86**
TOTAL NUMBER OF ANSWER			392	19	40	24	288	21	**1380**	**3,54**
Accessibility Value of the form				**49**	**138**	**80**	**1032**	**81**	**1380**	
Accessibility Value Exceeding Coefficient of the form				**2,58**	**3,45**	**3,33**	**3,58**	**3,86**	**3,36**	

Table 14 Forms of accessibility value of Example 3

The results and evaluations derived from the answers to the questions in the forms are as follows as;

FORM 1	Dikmen Vocational and Technical High School (Example 3)

Question	A.V. EX. C.		2,58		FORM A.V.		49	
20								
Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
19	**11**	57,89%	**1**	0%	**7**	36,84%	**1**	5,26%

Table 15 Form of Urban Furniture A.V. of Example 3

- ***Form 1: Urban Furniture of Example 3,*** No urban furniture was used on route to the building. On the school site the "Fully compatible" answers were high as of the nature of the furniture's, but there are accessibility problems to recreational areas and no means of perceivable signage along the route for the visually impaired as shown in figure 14.

Figure 14 Urban Furniture of Example 3(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 2	Dikmen Vocational and Technical High School (Example 3)

Question	A.V. EX. C.		3,45		FORM A.V.		138	
44								
Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
40	**5**	12,50%	**4**	0%	**20**	50,00%	**15**	37,50%

Table16 Form Pedestrian Crossing of A.V. of Example 3

- ***Form 2: Pedestrian Crossing of Example 3,*** there is no waiting area at the road side as required in relevant standard. There is no waiting area near the traffic light and there is no curb ramp designed for easy access. Also there is as a lack of markings and signage of the pedestrian crossing as shown in figure 15.

Figure15 Pedestrian Crossings of Example 2(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 3	Dikmen Vocational and Technical High School (Example 3)

Question	A.V.EX.C.		3,33		FORM A.V.		80	
24								
Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
24	**7**	29,17%	**0**	0%	**11**	45,83%	**6**	25,00%

Table 17 Form of Urban Furniture A.V. of Example 2

- ***Form 3: Bus stops of Example 3,*** have problems about signage of parking restrictions around bus stops. All bus stops are not signed on transparent surfaces to prevent visually impaired from crashing as required in the relevant standards. Along with that all bus stops have a lack of informative signage about the bus schedules and have lack of required furniture that are up to relevant standards as shown in figure 16.

Figure 16 Bus Stops of Example 3(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 4	Dikmen Vocational and Technical High School (Example 3)

Question	A.V.EX.C.		3,58		FORM A.V.		1032	
156								
Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
144	**21**	14,58%	**12**	0%	**62**	43,06%	**61**	42,36%

Table18 Form of Accessible Route of Example 3

- ***Form 4: Accessible Route of Example 3,*** has some other problems apart from the above. There is not even one accessible route to building entrance around the site wide enough as required as relevant standards. There is not at least one accessible route between the buildings within the site. The high slopes around the site are not solved with accessible ramps and/or other means of accessibility features such as platform lifts. There is no railing on higher sides of pavements which is a security problem for everybody along with people with mobility restraints. The pavements were not protected against car parking to allow an accessible route. Ramps higher that 5% does not have surface material as required in the relevant standard. Outer stairs have no railings on both sides and are not wide as 180 cm at any points shown in figure 17.

Figure17 Accessible routes of Example 3(Photograph: Cansu DİŞYAPAR, April 2015)

FORM 5	Dikmen Vocational and Technical High School (Example 3)

Question	A.V.EX.C.	3,86	FORM A.V.	81
21				

Answer	FULL COMPETIBLE		INVALID		FULL INCOMPETIBLE		INAPPLICABLE	
21	**0**	0%	**0**	0%	**9**	42,86%	**12**	57,14%

Table 19 Car Parks of Example 3

- ***Form 5: Car Park: of Example 3,*** have no designated and signed spaces for the disabled peoples' vehicles. No means of accessibility was achieved in either building. Along with that there are no means of designated accessible route to building entrances covered form atmospherically conditions. The material usages are also not convenient. Example 3 has no night time lighting.

Figure18 Car Parks of Example 3(Photograph: Cansu DİŞYAPAR, April 2015)

Comparative Evaluation

None of the pedestrian crossing around selected buildings has proper signage or equipment required for accessible movement. There must be speed humps and traffic lighting and proper signage on the floor.

None of the bus stops around selected buildings are fully accessible. There must be informative signage and maneuvering areas for wheelchair users. All bus stops must be covered and protected from atmospherically effects.

None of the accessible routes to selected school building have continuous perceivable guidance or are in bad physical condition. At the entrance of the school site there is no informative signage at any of the selected buildings. None of the selected buildings sites differentiate pedestrian walkways with car parking traffic. No parking signs on the asphalt were printed to orientate or coordinate within selected sites. Accessible route to building entrances are obstructed by randomly parked cars.
Urban furniture within all selected sites are usually damaged and in bad condition. Most of the pose threat to security of users because of their sharp edges. None of the ramps within and around the selected building sites are accessible as required in the related Turkish Standards.

As the aim of the study is not to comparatively evaluate the selected buildings, mostly encountered and common problems are listed above.

The aim of this study is to give aid to the efforts to reach a totally accessible environment within the proposed period of time when the deadline comes in July 2015. In order to achieve that a method of evaluation is proposed to evaluate other public buildings and spaces. By this method all public areas can be evaluated and proposals for solutions to the observed problems can be prepared. This also would promote easy guidance to new designs with regard to accessibility. For this research Turkish Standards TS 9111 (2011), TS 12576 (2012) are accepted true and as the main basis of evaluation. Forms prepared from these questions were applied to activity areas. Then the data collected from the answers are valuated and comparatively evaluated. A method of evaluating existing activity areas is proposed. By this way problems observed can be distinguished due to the priorities and solved via the proposed solutions.

With these solutions proposed, a more accessible public space can be achieved for the most adversely affected disabled population including the physically disabled, visually impaired and hearing-impaired groups.

4. CONCLUSION

Although there are many renovations to the building that improve the existing condition of the buildings and their surrounding environments, there are still a great amount of deficiencies regarding the needs of disabled people in all selected high school buildings and their surrounding environments. This might be due to the lack of awareness about the needs of the disabled people in the physically built environment and the lack of thought of them as potential users of any building.

As a result of the investigation of high school education buildings and the environments in context of Turkish Standards related accessibility, among public buildings;

- In this study, despite the fact that the deadline for all building to be accessible in 5.7.2015, the selected high school buildings were observed and specified via answers to the evaluation forms to be have some problems not only in building but also around the buildings.

- The physical alterations made throughout the period of time are not up to standards due to the lack of proper applications and the changes in the regulations.

- Not only the right of disabled people with disabilities but also rights of all the people were violated. Especially cars parked at pavements, pedestrian crossing and bus stops, are observed as the main problem. This way the distinction between the pedestrian way and traffic roads were significantly ignored.

In this study the main areas of problems observed were listed in results and evaluations. The primary proposal for solutions to these observed problems are as follows;

- **About the problems observed around Example 1;**

About Urban Furniture; all should be placed without forming obstacles to the pedestrian traffic. The colors of the furniture should be contrasting with the environment. Minimum required space between obstacles should be at least 175 Cm.

About Pedestrian Crossings; there must be waiting areas in the middle of crossings at three or more lane roads. (TS 12576 Article 5.4.1.1.2)

About Bus Stops; there must be a space allocated near the resting chairs in the bus-stops. The width of pavements near bus stops should be at least 300 cm(including the bus stop).(TS 12576 Article 5.1.1)

About Accessible Routes; along the accessible route there should not be any erected or moving ads / billboards, fixed elements like lighting poles (TS 12576 Article 5.1.5.1)

- **About the problems observed around Example 2;**

About Urban Furniture; all should be placed without forming obstacles to the pedestrian traffic.

About Pedestrian Crossings; there must be waiting areas in the middle of crossings at three or more lane roads. (TS 12576 Article 5.4.1.1.2) Curb ramps must be installed between the pavement and the pedestrian crossings and corners (TS 9111 Article 4.11.1.3) (TS 12576 Article 5.2). At intersection islands the crossing should be staggered to right. At at-grade crosswalk without light control yellow blinking light should be installed (TS 12576 Article 5.4.1.2). Also there must be signage at least 20 meters before the crossing. (TS 12576 Article 5.4.1.2)

About Accessible Routes; There must be at least one accessible route to the accessible building entrance from the public transport points, car parking areas and accessible passenger loading zones.(TS 9111 Article 4.3.1), At least one accessible route should be between buildings in the same site. (TS 9111 Article 4.3.1),

- **About the problems observed around Example 3;**

About Pedestrian Crossings; pedestrian crossings not at the junction should be enough distance from where they can see by the oncoming drivers Crosswalk width must be at least 300 cm wide and there should be curb ramps as wide as the crosswalk. (TS 12576 Article 5.4.1), Curb ramps must be installed between the pavement and the pedestrian crossings and corners (TS 9111 Article 4.11.1.3) Also there must be signage at least 20 meters before the crossing. (TS 12576 Article 5.4.1.2)

- **About all selected buildings and their surrounding environments;**

About Urban Furniture; Obstacles on the walking route should be in contrast colors of perceivable texture differences. There must be detectable warnings between pavements and resting areas. There must be at least 120cm x 90cm between the resting seats for a wheelchair to stand. At parks there should be at least 1 resting area at a range of 100 meters. In order to approach the table there must be at least 100cm depth under the table (TS 12576 Article 5.5)

About Pedestrian Crossings; If there is more height between the pavement and pedestrian crossing, a 3-

si,ded curb ramp should be installed(TS 9111, Article 4.4.3.1) (TS 12576 Article 5.2), Before the start of the ramp there should be at leastv60cm wide detectable warnings installed. (TS 9111 Article 4.4.3), Obstacles should be placed in the corner of the sidewalk to specify a curved surfaces (TS 9111 Article 4.11.1.3),Signalized at-grade pedestrian crossing traffic signal lamps should be equipped with colored moving/standing figured lights for the hearing impaired and detectable warning and audio warning equipment's for the visually impaired. (TS 12576 Article 5.4.1.1), Cross in gat middle islands of the 3 lined-roads should be made from different materials for the visually-impaired.(TS 12576 Article 5.4.1.1.2), At pedestrian crossings without lighting control, the crossing should be raised in order to reach the pavement level in order to slow down the vehicles and ease the movement of people with mobility restraints (TS 12576 Article 5.4.1.2),At at-grade crosswalk without light control yellow blinking light should be installed (TS 12576 Article 5.4.1.2). Crossing markings should be made from permanent and damage resistant paints. (TS 12576 Article 5.4.1.3), Pedestrian crossings should be lighted from above and with different colored brighter lighting (TS 12576 Article 5.4.1.4)

About Bus Stops; There must be a grab-bars installed at bus stops. There must be back-resting above 45cm behind the resting chairs (TS 12576 Article 5.5.1). Stopping and parking should be prohibited to other vehicles at bus stops by the horizontal and vertical markings (TS 12576 Article 5.8.1). If bus stops are made from transparent materials, a 15 cm thick bright, colorful, retro-reflective tape should be glued 100 cm and 140 cm level (TS 12576 Article 5.8.1). Informative signage should be installed at bus stops (TS 12576 Article 5.8.1). Bus schedule and informative signage should be lighted and at bus stops and Busses should be equipped with route number. (TS 12576 Article 5.8.3)

About Accessible Routes; There must be enough signage along the route in order to avoid confusion and detours (TS 9111 Article 4.3.1), Pavements should be at least 150 cm wide and at last 25 cm on building side and 50 cm at road side should be left for urban furniture and opening doors etc.. (TS 12576 Article 5.1.1), Floor gratings should be at most 13mm wide. (TS 12576 Article 5.1.6) (TS 9111 Article 4.3.6), Detectable signage should be continuous. Obstacles for car parks should be placed on the road side (TS 12576 Article 5.1.6), Trees, electric and traffic signs, plants etc. should be on 50 cm side aligned at a straight line. (TS 12576 Article 5.1.7.1).Before the start of the ramp there should be at leastv60cm wide detectable warnings installed (TS 9111 Article 4.4.3). If the width of the ramp is wider than 300 cm three must be a grab bar at the middle of it and grab bars on sides. (TS 9111, Article 4.4.3.4), At important decision making points there should be informative signage, additional lighting and contrasting colors along with detectable warnings in order to sustain orientation. (TS 9111, Article 4.4.2.2). If the accessible route must have ramps higher than 6% (1/16) or stairs, elevators and escalators, there must be informative signage and detectable warnings. (TS 9111, Article 4.2.2), ıf the accessible route is different than the common route it should be signed. (TS 9111, Article 4.4.2.2)

About car Parks; designated parking areas should not be farther than 30 meters to the building entrance parking should be directly connected to the entrance. Markings should be appropriate according to the related articles and must be reserved at all times. An intersection between traffic roads must be avoided at all times. Loading zones must be connected to the pavement by curb ramps. (TS 9111 Article 4.4.1) (TS 12576 Article 5.7)

With these solutions proposed, a more accessible public space can be achieved for the most adversely affected disabled population including the physically disabled, visually impaired and hearing-impaired groups. At new designs and renovation projects, the standards related with accessibility should be taken into consideration and applied and a specific section in TS 9111 should be prepared regarding the school buildings.

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