The Impact of Landmarks on Children's Way-Finding in between Home and School

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ABSTRACT

Way finding is an important dilemma for children in especially when they are walking from home to their educational environments. There are different solutions for helping them find their way to their schools which is one of the essential spaces where they spend most of their time. In this way, architecture plays an important role in children's way finding. Therefore, different architectural principles and elements can be employed in order to create better spaces in which children are able to find their way more easily. This research is an attempt to examine the role of landmarks on the children's way finding on the way from home to educational spaces. Porpoise one hundred and seventy students have been interviewed (eighty-four boys, eighty-six girls) in a primary school in Nicosia and Famagusta, North Cyprus. The research questions if architectural landmarks have any effect on wayfinding at children from school to home and which landmark from is more effective and whether preference change according to gender the study clarifies the percentage of students considering architecture landmark as an influential factor in spatial perception based on their gender.

Keywords: Children, cognition, Way finding, Home to Educational routes, Architectural landmarks

ÖZ

Çocuklar için okul ile ev arası yön bulma önemli kavramlar arasındadır. Okul ile yaşam mekanları arasında rotalarını rahatça bulmaları için farklı çözümlere gitmektedirler, bu da zamanlarının çoğunu almaktadır. Bu kapsamda çocuklar için mimari öğeler yön bulma açısından önemli bir yer tutmaktadır. Farklı mimari elemanlar ve çözümler çocukların yön bulmalarında ve mekanların farklılaşmasında önemli rol oynar. Bu tez yapılı çevredeki İşaret Öğelerinin ilkokul çocukları tarafından nasıl algılandığını araştırır ve örnek olarak hem tarihi hem de yeni yapılı çevreyi beraberinde barındıran Lefkoşa ve Mağusa kentlerindeki ilkokul-ev ilişkisini incelemektedir. İncelemede algılama metodu kullanılarak kız ve erkek çocuklar üzerinde İşaret Öğe'lerinin nasıl bir algı yartattığına ve mekansal algılarının bu yaşlarda hangi elemanlara göre oluşturulduğuna bakmaktadır.

Anahtar Kelimeler: Yön Bulma, Algı, Ev, Eğitim Ortamları, Mimari İşaret Öğeleri

To My Parents

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Chapter1

INTRODUCTION

The urban environment is the main container of social interaction, where people need to provide knowledge and understanding in order to perform daily activities. Therefore, the quality of their activities is under the strong influence of the configuration of urban subsets, elements and structure. These factors have a direct impact on activities such as decision making, way finding, and visual connections and so on. Pardy cites sociologist Sharon Zukin in claiming that, the look and feel of cities mirror decisions about what and who should be visible and what should not, concepts of order and disorder, and on usage of aesthetic power. She thereby highlights a class aesthetic (Pardy 2009:9).

Public daily interactions take location based on human interactions with the elements and the environment of the spaces. As Gärling (1989) Claims, the direct or indirect influence of the environment on people's space behavior can be found by investigating sensory processes; and the information transferred via sensory pattern. Hence, the environmentally related activities lead to collective images, which are gathered through sensory patterns.

Moreover, in order to investigate human activities within the urban context, it is necessary to have an overview of the urban structure and subsets and also the system within which these components are working. The arrangement of urban elements and

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components is a very essential tool for navigating within the cities; and there is a need for awareness about this issue in order to qualify the awareness about the navigation and process of way finding in cities.

Navigational information is defined as having complete landmark knowledge of an environment. There are two different types of navigational awareness of an environment and each type ability different behaviors.

"Knowledge of relationships of location along this path is unidimensional, a person will be better at recalling when it is in the orientation they learned the route. (Allen and Kirasic, 1985).

The research on wayfinding awareness has shown that to attain complete wayfinding knowledge in a new wide space environment, a person has to go via a constructive dynamic process. This procedure is described in a pattern from Siegel & White, (1975), termed the "Sequential and Hierarchical" pattern, which will be discussed in later chapters.

1.1 Problem Statement

Arrangements in the built environment have a direct impact on the accessibility between destinations in urban environments. Moreover, in order to have a better understanding of urban spaces through architectural elements in the built environment, children are proposed with wayfinding oportunitis ; there is a need to clarify and new developing spaces within the urban fabric. Lack of spatial quality in new developed districts and newly constructed buildings in these areas cause inadequate sensory in way finding especially for the children who are in primary schools. Since, primary schools are the first Community that children enter without any parents or even the

help of them, they will confuse whilst visual principles can be used for subtractive the level of confusion in way-finding.

1.2 Aim and Objectives of the Study

In order to understand how children perceive spaces around them, there is a need to observe how children perceive the environment and what type of elements they take into consideration on their daily trips within the city. Hence, the main aim of this thesis is to assess wayfinding perceptions of who have entered primary school.

Additionally, another aim of the study is to find out how children find their way by using references on a daily trip from home to school.

1.3 Research Questions

The main research questions of these are the following.

1. What is the wayfinding?

2. How do the children find their way?

3. In order to have an understanding how children perceive spaces around them?

The subquestion of these are the following.

- What sort of visual elements affect the spatial perception of Children?

- How Landmarks are taken into consideration on Children's cognition?

- Are there any differences between way finding in traditional and newly developed urban spaces?

- Do children focus on specific elements while they are travelling within the urban spaces?

- Are there any differences between traditional and contemporary spaces based on landmarks?

1.4 Research Methodology

This thesis is a research based on document survey, interviews, observations and case studies; which are in the categories of qualitative and quantitative research.

1. Literature review of primary and secondary sources: is done for the purpose of gathering information about way finding, role of landmarks as an architectural element in space perception; and children's ways of perception comparing to adults', which implies on the difficulties they face in wayfinding to school.

The main sources that are used in this thesis are from the scholars such as Kevin Lynch, the image of the city (1960), Jane Jacobs, Life and Death of an American City (1961) and other scholars with related research areas.

2. Comparative analysis: there are case studies chosen from successful examples that already worked on children's way finding; and therefore comparing the situation in the chosen cases from North Cyprus with these examples can be helpful to find the indicators that can be developed or established to improve the quality of way finding in terms of this study.

3. Interview: this research attempts to investigate the role of landmark as a wayfinding architectural element use of questionnaire forms of children aged between 8 to 12 years old.

4. Observation: by analyzing the behavior of children while they are on the route.

1.5 Limitations

This thesis will focus on children with ages between 8 and 12 years old. The case study under the investigation includes two primary schools from Famagusta and 2 primary schools from Nicosia, both in traditional and contemporary urban fabric, in North Cyprus. Additionally, this thesis is not focusing the background of the children.

1.6 The structure of the Thesis

The thesis consists of five chapters. In the first chapter the importance of wayfinding is stated and the allotment of landmark and architectural building on the child's way-finding is examined. Additionally, aim and objective of the thesis are clarified and then research methodology is selected.

The second chapter peruses the theory of wayfinding. In the first stage the description of way-finding, its importance in human psychology, and requirements for activities are stated. Configuration and design of the place in the frame of form, scale and flow systems, and landmarks in urban fabric are classified under the architectural way-finding design strategies. Methods, definitions and rules about way-finding and its significance in terms of spatial learning are explained. In the third stage, individual differences in way-finding skills are given. The effects of age, gender, familiarity differences in way-finding skills are discussed.

The fourth chapter includes a comparative evaluation of the cases. Finally, the thesis is concluded with the fifth chapter.
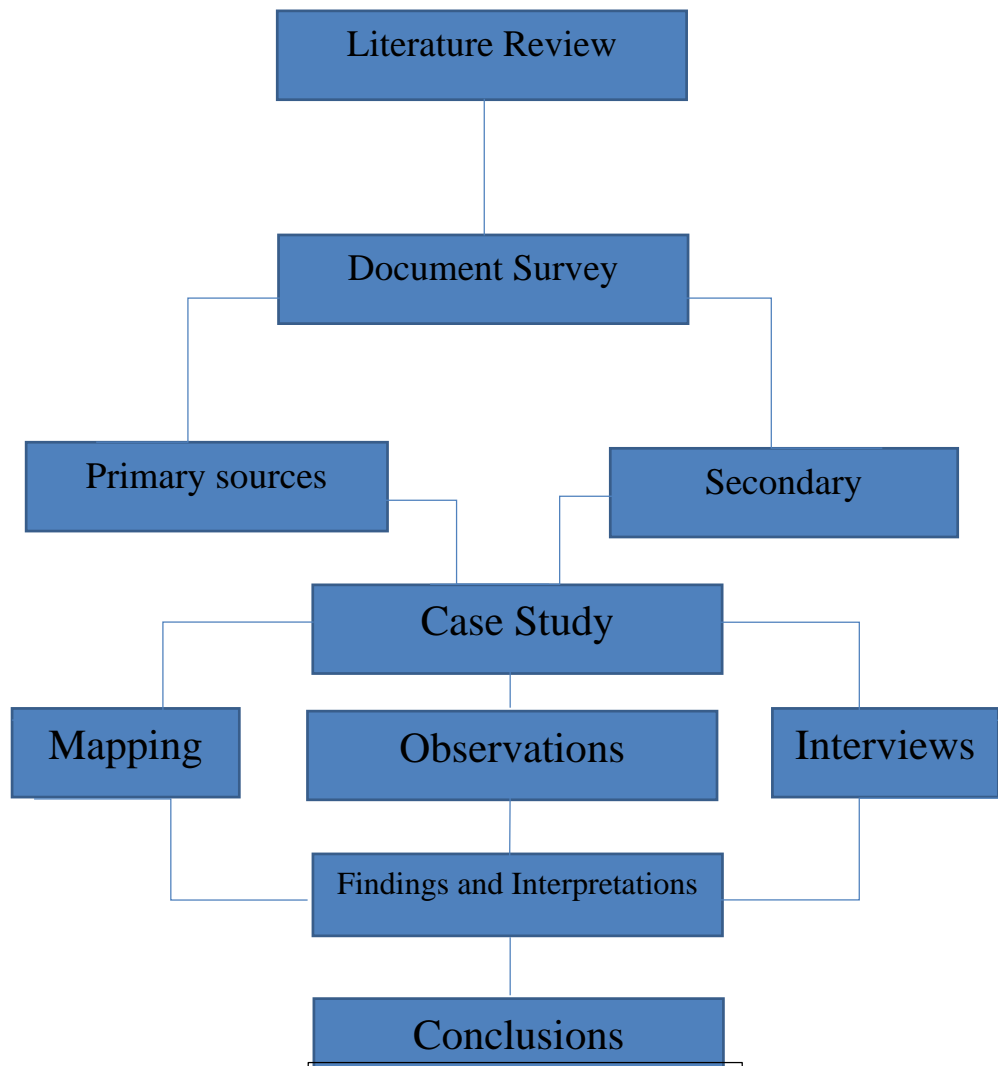
Figure 1.1: Structure of thesis

Chapter 2

DIMENSIONS OF WAY FINDING

Approaches to the issue of wayfinding and spatial perception and cognition can be formal and psychological and also socio- cultural. It is also related to education when it comes to children. Some of the tools for empowering space perception and wayfinding are signs and landmarks.

In order to understand the process of wayfinding and role of urban elements that affect the quality of wayfinding, the first step is to understand the urban form and its features. Afterwards it will be useful to investigate the importance of wayfinding in urban spaces for the daily social activities in general. The next key issue to be focused on in this chapter is the recognition of those elements in an urban environment that have impacts on wayfinding. At this stage, since the focus of this study is on the effect of landmarks on wayfinding, the focus on landmarks and related issues to landmarks and their relationship wayfinding.

2.1 Wayfinding in Urban Spaces

An urban planner's job involves designs of urban forms based on various indicators and giving quality to urban life. Wayfinding within an urban environment is strictly related to the form of urban spaces and quality of their design. Therefore, to realize the importance of these factors in the process of wayfinding, the below sections are going to open discussions about urban design and urban form (Arthur, P., Passini, R) (1992).

2.1.1 Urban Space

Urban spaces are created in various shapes. During the history, there have been designing patterns for some ancient cities. On the other hand, some cities have formed arbitrarily based on many circumstances, including geography, economy, climate, cultural values and so on. Cities are compositions of places and spaces, which encompass multiple services and functions. According to Lynch (1985), cities are very frequently observed as a collective of smaller spaces. Most of the basic urban design ideas, in terms of their functions, such as shopping malls/ centers, neighborhoods, playgrounds, junctions and other spaces, are the reflection of such tendency. As a default the assumption of well-designed neighborhood would be the ones with suitable roads, adequate shopping centers and industry from which the result is ideal settlement. Likewise, most planners believe that a beautiful city is just a collection of beautifully designed small urban areas, Lynch (1985).

Here's what has been stated, is true if it is told that a building is just a random collection of adequate rooms. The arrangement and organization of the qualified parts of a whole are what makes that whole high quality. Thus, there are five criteria defined in order to more analysis at the urban scale (Lynch, 1958, p. 65).

The first criteria is to identify form and those significant qualities in a city or metropolitan scale; and these factors can be controlled at the same scale; and also they have different impacts if they are arranged in various patterns that can be described in the same scale. This criterion eliminates those features that are described beyond the city level, such as the relation between a house's front door and the street; and these features are difficult to be described in city scale, unless as a whole and their pattern of distribution within the city are not necessarily important (Lynch, 1958).

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The second criterion includes the gaps that need to deal exclusively with the physical urban form or the distribution of activities in urban space; and it should also deal with the fact that these two features should be carefully separated. Town planners primarily deal with the physical environment, but at the same time there are complex social, economic or physical effects to be considered. Their area of expertise works in the physical and spatial development: streets, buildings, services, activity distributions, spaces and interrelation between them (Lynch, 1958).

In this respect, a planner is alerted about the fact that the final purpose of his/her work is its human effect; and they are supposed to consider the fact that physical or locational effects may frequently be of the least importance, or be operative only in relation with another circumstance.

To summarize all the above mentioned, the categories of analysis of urban form must:

1- be significant at the city scale; and this scale is possible to be controlled and is describable in the level of criteria.

2- Comprise the physical shape or the distribution of activities; and not to complicate these two.

3- Handle all urban settlements.

4- Be able to be recorded, connected and examined.

5-Be significant in terms of their impact on the achievement of human aims and encompass all substantial physical attributes (Carmona, 2003).

2.1.2 Objectives of Urban Design

Origin of the term 'urban design' dates back to late 1950's in North America. It replaces the term 'civic design', which was outdated and so narrow. Composed from two words 'urban' and 'design', it is an unclear terminology. Thus, considering each

word separately: 'urban' refers to the cities' or towns' characteristics; and the word 'design' points to activities such as sketching, planning, arranging, coloring and pattern creating (Carmona, 2003).

According to Tibbalds (1988a, p. 369), the overall responsibility of urban design covers 'everything that is visible in a window frame'. In this sense, if one considers everything as urban design, then with the basic truth and logic, 'nothing' can be equally considered as 'urban design' again (Daganhart and Sawicki, 1994).

Basically, the most efficient master plans and frameworks in urban fields are arranged by a group of various experts, who work in collaboration. Urban design is an interdisciplinary and collaborative discourse and practice, with and combined approach. As Lynch (1981) claimed in a broad perspective, it includes a wide range of issues from various scales of spaces. He believes that urban designers might engage with preparation of comprehensive case studies, new town plans, regional park systems; and on the other hand, seeking for neighborhood street protection, revitalization of public squares and so on. Urban design operates within and across a diverse range of spatial scales, instead of just focusing on one particular area. Urban design, encompass subjects of perception and sense of place. Jarvis (1980) identifies a Lynch's approach as the key advocate in this respect and highlights his attempt in directing urban design's focus in two paths:

1. Appreciating the urban environment: to reject the exclusive and elitist notion; Lynch points to the preference of urban environments as being the place for common activities.

2. He suggested to examine people's perceptions and mental images instead of inspecting the physical form of urban spaces. Thus he changed his direction according to the object of study.

Jacobs (1961), emphasized on the role of urban features such as streets, sidewalks and parks as containers for human activities and social interactions. Urban design in contemporary time is a simultaneous attempt to deal with urban design considering urban spaces as aesthetic entity and behavioral scenery. Its focus is diverse and active, which are the factors helping to create efficient urban places; and especially it focuses on how well the physical environment backing the activities and functions, which take space in these areas. Considering such concept, urban design emerges as the notion of designing and managing the 'public realm', which includes buildings' public face, spaces between facades; and activities that take place within and between spaces and management of these activities. All the mentioned and other issues that are affected by the use of buildings known as 'private realm' (Gleave, 1990, p .178).

As it has been claimed in (DoE Planning Policy Guidance Note 1, 1997, para. 74) the UK Planning Policy Guidance:

> The relationship between different buildings; the relationship between buildings and the streets, squares, parks and other spaces which make up the public domain itself; the relationship of one part- -of a village, town or city with the other parts; and the patterns of movement and activity which are thereby established. In short, the complex relationships between all the elements of built and unbuilt space.

Accordingly, there are seven aims of urban design, which individuals relate to the concept of place:

• Character: a place with a unique identity

• Continuity and enclosure: a place that contains public and private spaces in a distinguished manner

• Quality of the public realm: a place containing significant and effective and successful outdoor spas

• Ease of movement: an easy place to understand and move through

• Legibility: a place with a clear image and easy to comprehend

• Adaptability: a place that is flexible to change

• Diversity: a place with variety and choice (Carmona, 2013).

Considering these objectives, there is a direct relationship between urban design and quality of wayfinding. Thus to understand the impact of urban design and urban elements, it is necessary to go through wayfinding, its elements and other related issues.

2.2 Way Finding in Urban Spaces

In order to understand the process of wayfinding in an urban environment, it is necessary to go through the process of urban design and its basic concepts and principles. Having information about the nature and rules of urban design, will create a platform for understanding how wayfinding works in urban spaces and how it forms and develops. Hence this part will go through urban design itself and in the next stage it will focus on the elements and features in the urban fabric that affect wayfinding.

2.2.1 Frameworks for Wayfinding within Urban Spaces

According to Lynch (1960), the base of human wayfinding is a steady use of and establishing certain sensory cues from the outdoor environment. Siegel (1975) claimed that wayfinding takes place in various situations when people travel across countries by cars, or walk in urban spaces, or move through a building. Its final aim is to find

the ways between two destinations. To find ways, people need particular knowledge and cognitive skills.

As Lynch (1960) defined, spatial knowledge includes three parts: landmark, route, and survey knowledges. Cognitive skills depend on the mission at hand, which is finding the way in an urban network in any scale or navigating within a building. Therefore, people precede a mental representation of the environment in a cognitive map; and this representation is a response to their perceptions of the real environment. There are two categories of wayfinding research: performance and competence. Kevin Lynch's (1964) urban design principles are referred to as the basis for wayfinding research. There are four classes of environment's features that (Wiseman, 1981,p.375) believed affect wayfinding performance in the built environment:

1. Visual contact (Figure 2.1).

2. Architectural variations (Figure 2.1).

3. Signs and number of spaces for providing identification or directional information (Figure 2.2).

4. Planner layout (Figure 2.3).

Wayfinding is the capacity to recognize one area and touch base at destinations or explore in special situations, both psychologically and behaviourally (Passini, 1984a; Rovine and Weisman, 1989). People select the vital bits of data among a boundless measure of boosting intentionally or unknowingly experiencing some subjective procedures. Amid the wayfinding action, we extricate data from nature, store it, process it, and review it when vital. Wayfinding capacity, which depends on three unmistakable exhibitions, **decision making, decision execution** and **data preparing**, is a spatial critical thinking capacity, and is key for regular living, as practically

everybody has a need to discover their way to another area, for example, a classroom,

store, or school (Passini, 1995).

Figure 2.1: Visual contact and architectural variations, www.greshamsmith.com

Figure 2.2: Signs and number of spaces for providing identification or directional
information, http|://bugejayasmin.com.tr (2016.01.02)

Figure 2.3: Planner layout, www.aiga.org (2016.01.02)

The greater part of the data taken from the environment while the wayfinding process is called *environmental information*. Recently, the impacts of ecological data on the individuals' wayfinding conduct in complex structures have been liable to various exploration ponders (Doğu and Erkip, 2000; Passini et al., 1998; Abu - Ghazzeh, 1996,p.303-318; Wright et al., 1993; O'Neill, 1991a,p.553; Garling et al., 1983,p.54). Environmental data are the architectural and visual expression of data important to tackle the wayfinding issues (Passini et al., 1998). Choices, settling on and choice execution depends on environmental data. Information must be distinguished in the setting and must be comprehended and utilized as part of the choice – related procedures. For a careful comprehension of the procedures we experience amid wayfinding, it is fundamental to comprehend the subjective and natural elements that have an impact on it.

2.2.2 Dimensions of Wayfinding

The process of refunding occurs whilst cognitive acts through the urban context's pattern. One may consider the importance of two specific dimensions of wayfinding in terms of this study. These two dimensions are *cognitive mapping* and *legibility*,

considered as the indicators of individual and physical dimensions in this respect, Lynch, K. (1960), (The image of the city).

2.2.2.1 Cognitive Mapping

This dimension is the main component of the knowledge of space, which includes the process in which one should undertake while wayfinding. In this step, gathered information from space and built environment (architecture) is used in order to make decisions, execute decisions and to interpret the environmental situations.

Cognitive mapping includes an extra capacity for processing the information that is precise for the spatial representation of places. According to Garling et al, (1984,p.358), one will need many things in order to find their way by means of cognitive maps, such as developing landmark, route or survey knowledge; and that knowledge improves based on the degree of information they gather about the environment. Therefore, at first, one should generally understand that movement in an environment is for an aim and for that the person should be prepared to some extent. Afterwards, cognitive map should aid the traveler to design their movement forward. In doing that, this map must be input to the environment; and for this the features of cognitive map will be translated into environmental factors. While moving around, the traveler needs to keep track of the movements they have preceded. Recognition of places helps a person to maintain his/ her orientation in the environment; but they should have the ability of keeping the track of their location compared to the points of systems of reference as well.

Stea (1969) indicated that, cognitive maps also reproduce the hierarchy of points in the space, considering the relative distance and size. These maps also cover information about the amount of interconnection between points within the geographic

environment (see Figure 2.4 by Guy Debord). Furthermore, Montello (1991) claimed that orientation in the space naturally depends on perceptions of environmental structure and processes that are undertaken to access the knowledge that is stored in memory. Environmental structure should affect the perceptional structure and memory; if not, use of the stored knowledge will not be much in locomotion and other types of orientation performances.
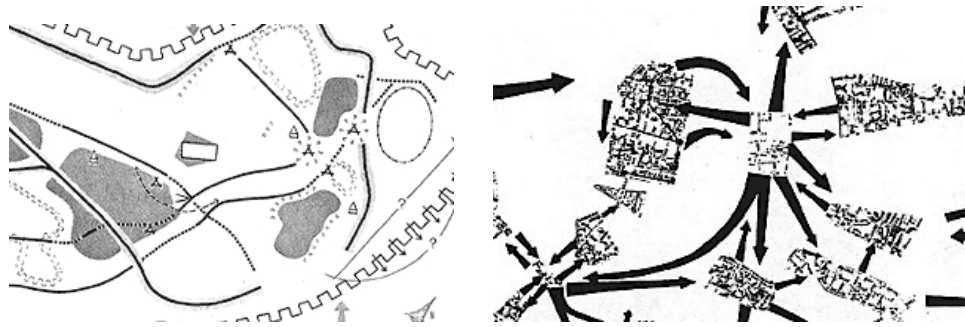
Figure 2.4: Cognitive map of Boston by Kevin Lynch
http://mysite.pratt.edu/~worlds/LogSpring2003/notation-lynch.gif(2016.01.02)

On the other hand, memory has impacts on attention to environmental structure and its different aspects. Affluence and the correctness of what people obtain from their new spatial knowledge are under the influence of memory and environmental structure. Therefore cognition of individuals is based on a conceptual map, fed by various sets of information (figure 2.5). According to the diagram below, concept maps are created to find answers to questions; and are representative of the knowledge that one has gathered which has led to those asked questions. Accordingly, by the given data and variety of analyzes leads one towards creative processes, which provide symbols and meanings. These meanings and symbols are also extracted from objects and events. Generally, concept maps are created through a complicated process.

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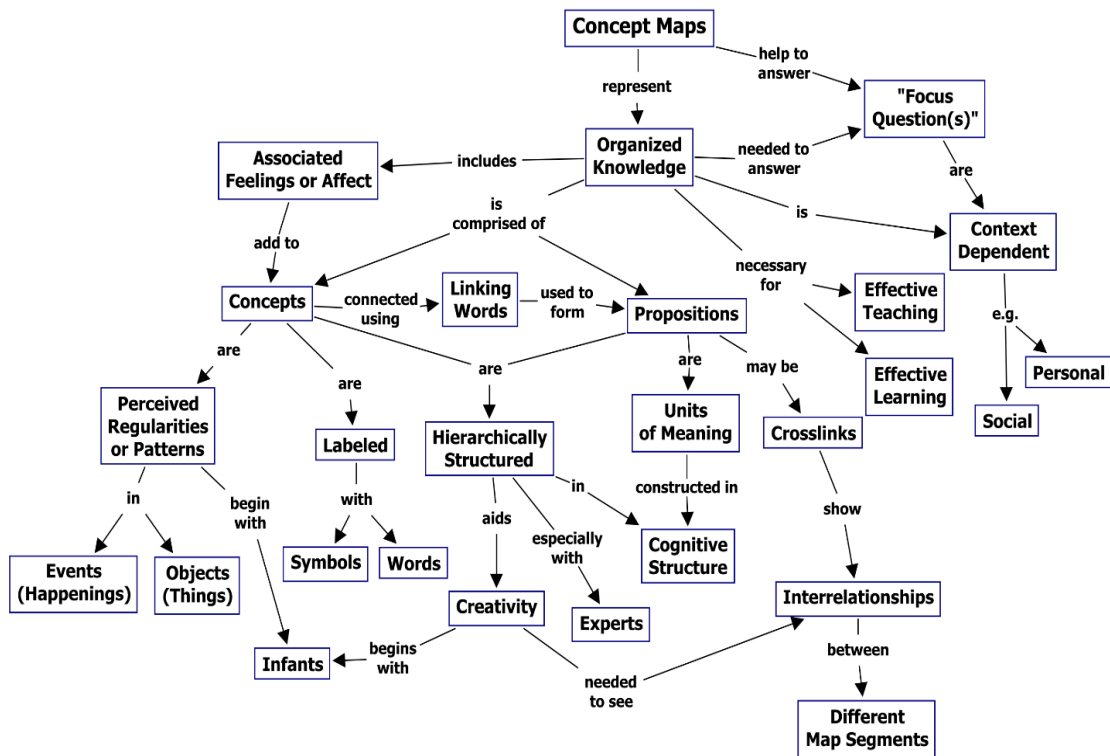
Figure 2.5: An example for diagram of concept maps in cognitive process
http://cmap.ihmc.us/Publications/ResearchPapers/TheoryCmaps/Fig1CmapAboutCm
aps-large.png (2016.01.03)

As Passini (1996) claimed, there are two types of representations to be distinguished: first is the representation of a space that is observed from a vantage point; and the second is the representation of a space that cannot be perceived from one vantage point and should be built by a number of views that are observed from different points in one setting (IE. Survey knowledge). The second type is the cognitive map. To make a combination of different views needs a mental structuring process.

Passini (1995) claimed that, for some people wayfinding happens efficiently based on seeing simple or cartographic distortion of representation of spatial systems. This is clarified by the fact that to make decisions on new routes is a continuous procedure, which depends on spatial representations as well as on data saw or perceived amid the trip and comparable encounters of past trips. Decision execution, the main operation

required on commonplace excursions, depends on acknowledgment instead of a review. On the other hand, according to Apple yard (1969, 1970) and Lynch (1960), while people draw individual maps of the same setting, they distort similarly; and this is evident about the impact of prototype biases in the outline of physical settings. Among a portion of the all the more normally noted distortions are the rectifying of long, progressive bends, the squaring of non-opposite convergences, and the adjusting of non-parallel boulevards. Evans et al. (1981,p.474) surveyed changes in grown-ups' [1]portrayal maps of their residential surroundings over a one-year period. Subjects from two autonomous examples reviewed essentially more ways and hubs following one year's habitation however the same number of points of interest. The milestones reviewed were about indistinguishable to those recalled amid the main week. Besides, way frameworks were expounded with the beginning point of interest structure with the vast majority of the expansions in ways reflecting option courses between effectively settled landmarks.

Map typology reflects significant contrasts in the representation spaces, one sort being linearly composed, which is: 1) the route map, another sort being spatially sorted out, which is: 2) the survey map, as said in the past to make sense with what is acknowledged. The criterion of choice will be the pertinence of that data to the body of knowledge officially procured, which, as far as the physical environment, is described by the cognitive map, (Ramadier, T. & Moser, G. 1998, p. 308). If wayfinding styles are undoubtedly connected to a typology of cognitive maps, certain

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[1] It is a map that is generated by the viewer by identifying and understanding the geographic and environmental codes and signs.

parts of wayfinding conduct could be expected on the premise of a man's kind of psychological guide. While cognitive maps relate the association and the structure of the ecological data held, wayfinding styles indicate the data a man looks for and utilizes when taking care of wayfinding issues. The connection between the two is built up if one recollects that individuals effectively and specifically look for information, Stea, D. (1969, p.474).

There are some very enticing purposes behind geographers to concentrate on subjective mapping not slightest its fundamental speak, to see how and why individuals carry on in space as they do. Different applications incorporate the arranging of situations that are anything but difficult to enhanced, the educating of wayfinding and introduction abilities, and general classroom topographically based activities, for example, map perusing, enhancing geographic material, for example, You-Are-Here maps so they are all the more effectively comprehended, and enhancing the databases and interfaces of land data frameworks (Kitchin, 1994a, p. 47).

2.2.2.2 Legibility in Wayfinding

Lynch's (1960) idea of legibility has impacted greatly the fields of planning and architecture.

> "Legibility is the ease with which its [the city's] parts can be recognized and can be organized into a coherent pattern" (Lynch, 1960, pp. 2-3)

A person's ability in information processing can be recognized as it categorizes with architectural elements and space. The challenges might emerge when a man is taking data from the environment, attempting to understand/decode, then process the gained data. Wayfinders attempting to achieve their destinations are regularly gone up against with mind boggling, uncertain or insignificant data inside of structures too extensive

to be in any way seen completely. Despite the fact that the architecture itself, IE. The spatial setup of a structure might comprise the information to produce a "wayfinding" framework, certain spaces loan themselves better for removing and understanding the pertinent data. This quality is alluded to as "legibility". A spot that encourages acquiring and comprehension of natural data has a high clarity component, O' Neill, M. J. (1991a).

O'Neill and Jasper define architectural legibility as:

The degree to which the designed features of the environment aid people in creating an effective mental image, or "cognitive map" of the spatial relationships within a building, and the subsequent ease of wayfinding within the environment. (O'Neill and Jasper, 1992, p. 411)

The legibility of major architectural elements, for example, doors, level and vertical circulation, the capacity to see through the building and significant landmarks are a pre-imperative to comprehension the spatial association of a building. In the event that the space does not have an unmistakable spatial association, it is not seen, thus has a low clarity calculate and does not assist with wayfinding. The rule of the spatial association must be conveyed to the wayfinding clients (Arthur and Passini, 1992). The decipher ability of a compositional domain has been found to influence the value of an extensive variety of building sorts. Its impact goes past, minor "convenience" of a building yet incorporates different variables, for example, individual solace. Legibility of a spot can be controlled by the expansion or cancellation of certain compositional components.

The legibility of the architectural environment is a critical design issue that impacts the simplicity of wayfinding for some individuals. Evans (1982) noticed that the illegibility of a location so as to set might affect stress disarray and a sense of inability,

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and recommended that neatness ought to be "viewed as a basis for useable habits " for all clients (p. 94). Wener and Kaminoff (1983) found that legibility in a remedial focus essentially decreased client disarray, outrage, saw swarming, and general emotional anxiety.

Weisman (1987,p.191) proposed that the level of architectural legibility can influence the level of motion, feeling of control, and well-being in crisis circumstances for regulated elderly. For wayfinding at the building scale, it is critical to know the associations between spots, since this data is vital for selecting effective courses from beginning to destination (O'Neill, 1991b). Various outline components are thought to on impact legibility, for example, signage, visual access to the outside, architectural diversity, and floor plan setup (Weisman, 1981). Garling et al. (1983) state that the introduction inside of a building is prone to be much simpler if visual availability is given.

The difference between the five mentioned elements is not always simple; also some environmental feature might give more than a single meaning. On the off chance that five key components are removed from nature and used to develop a psychological guide of a city or a building, the organizer ought to fare thee well to underline them in his spatial originations. In doing as such, he would expand the nature of legibility and picture ability of a spot (Passini, 1984a). Procurement of these qualities is vital to make complete and fulfilling situations for clients with various physical and mental capacities.

> When legibility is just measured as a spatial or functional form, it fails to analyze the influence of social meanings on spatial cognition because investigations generally isolate the social or cultural context of the relationship between individuals and surroundings. (Ramadier and Moser, 1998, p. 317).

Finally, it can be said that contrasting neatness in both design and urban scales is essentially influenced by two arrangements of components or elements that can't be considered totally free from each other. Components, for example, passages, level and vertical course if there should arise an occurrence of individual structures, are the best elements in the size of building design. Then again there are five key elements in urban scale known as: ways, hubs (convergences), and points of interest, areas, and limits (edges). As it was mentioned in the above, legibility generally happens through these two arrangements of components inside urban spaces.

2.3 Elements of Urban Environment and Wayfinding

In order to have a proper realization of the urban spaces and interactions within these spaces it is essential to have knowledge about the dimensions that are considered in the process of urban design and accordingly it is a guidance to study, understand and analyze the role of urban design in a way finding as much as other functions within the cities and interactions. These interactions take place within urban environments and activities based on citizens' relations with urban elements and other citizens.

2.3.1 The Urban Image and Meanings

The research about people's urban environmental perception dates back to the early 1960's, when an interdisciplinary field of study raised in the area of environmental perception. At the very beginning, there was a concern with environmental images, which was enhanced by focusing on symbolism and meaning within the built environment (Carmona, 2013, public place - urban spaces, p.49). On the other hand, the attention to environmental perception has become stronger with a research theme focusing on the experimental sense of place and lived-in experiments that are related to urban environments.

Lynch pursued to the identification of the city's public, communal image, or its major components. He claimed that 'workable' environmental visions needed three qualities:

• Identity: an item's qualification from different things, as a distinct substance (e.g. An entryway), (Figure 2.6).

• Structure: the object's spatial connection to the onlooker and different items (e.g. The car's position), (Figure 2.7).

• Meaning: the object's sense (applied and/or expressive) for the eyewitness (e.g. The entryway as an opening for getting out) (Lynch, 1960), (Figure 2.8).

Figure 2.6: Identity of environmental visions, http://sigalonenvironment.soup.io (2016.01.02)
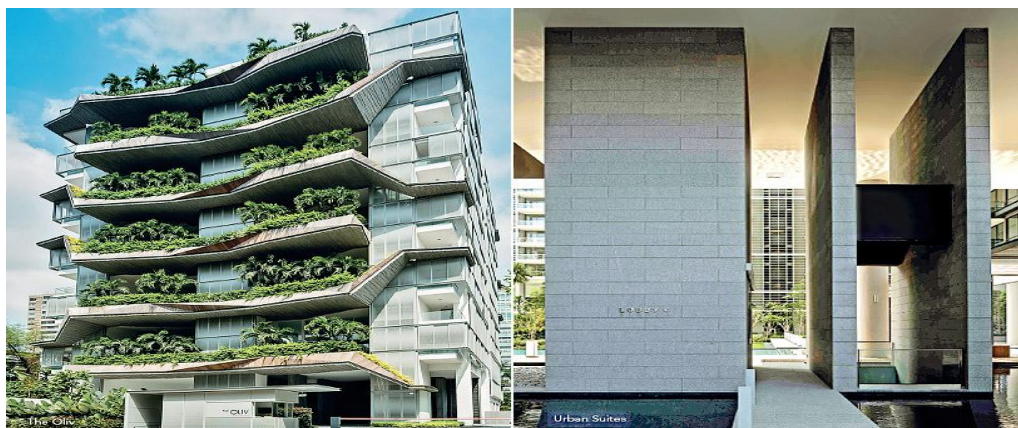
Figure 2.7: Structure of environmental visions, http://www.insis.com (2016.01.02)

Figure 2.8: Meaning of environmental visions, http://weburbanist.com (2016.01.02)

Because meaning was more opposed to being steady at the city level and across different groups of individuals, Lynch made a distinction between form and meaning, investigating image ability as far as physical qualities linking with identity and structure. By mental mapping (cognitive geography) exercises, Lynch meant to distinguish parts of the environment that left a solid picture in onlookers' brains. The city image can be a result of the combination of individual images. There are five key elements driven from Lynch's research in his book 'image of the city:

1. Paths: referring to channels through which citizens me such as streets.

Lynch, K. (1960) often took paths as the major elements in human vision, together with all the features and elements that are located along them. In spots that paths needed identity or were usually confused with other paths, the overall image became less clear. For many reasons, paths can be considered as important elements of urban images, for example, because they include a regular use, they concentrate on specific uses, their façade characteristics, visual distinction, or for the benefit of their position in the whole topography or the structure of the path.

Figure 2.9: Paths, key elements driven, www.chinaurbandevelopment.com
(2016.01.02)
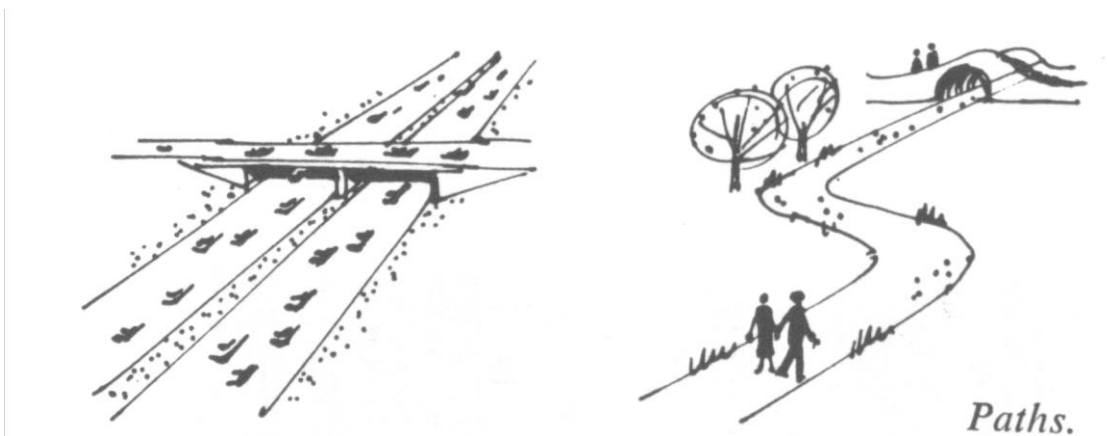
Figure 2.10: Paths, key elements driven, www.krypton.mnsu.edu (2015.11.09)

2. Edges: refer to linear elements, which are not definitely used or known as paths while the frequently form the borders between zones or create linear breaks in continuous patterns; and examples for edges can be railroaded cuts or walls, (Figure 2.10) and (Figure 2.11).

Figure 2.11: Edges, key elements driven, blog.playingwithspaces.com (2015.11.09)
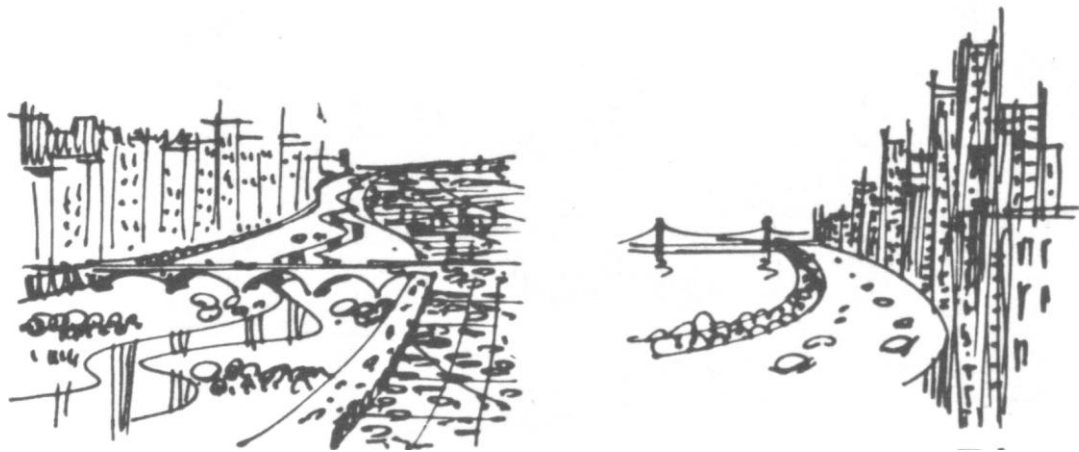
Figure 2.12: edges, key elements driven, www.ahbelab.com (2015.11.09)

3. Districts: refer to parts, with medium to large sizes, within the city, where citizens mentally enter and leave through recognitions of identical physical characters of 'thematic continuities' of features such as texture, residents, topography, usage, form, etc. it may be necessary to empower the signs in order to create a stronger image. Districts can have defined or uncertain boundaries (Figure 2.13).

Figure 2.13: Districts, key elements driven www.popupcity.net (2015.11.09)

4. Nodes: refer to reference points, which are planned as strategic spots where citizens can enter; and are intensive centers that citizen travel to or from. Nodes, on the one hand, can be mostly junctions, or thematic concentrations of a specific usage or physical attribute. Nodes are more significant since they change travel modes or create junctions that lead to drawing more attention. Dominant nodes perform mostly as both concentration point and junction, with functional and physical implications like public squares. Likewise, individual physical forms are more probable to make a node more significant (Figure 2.14).
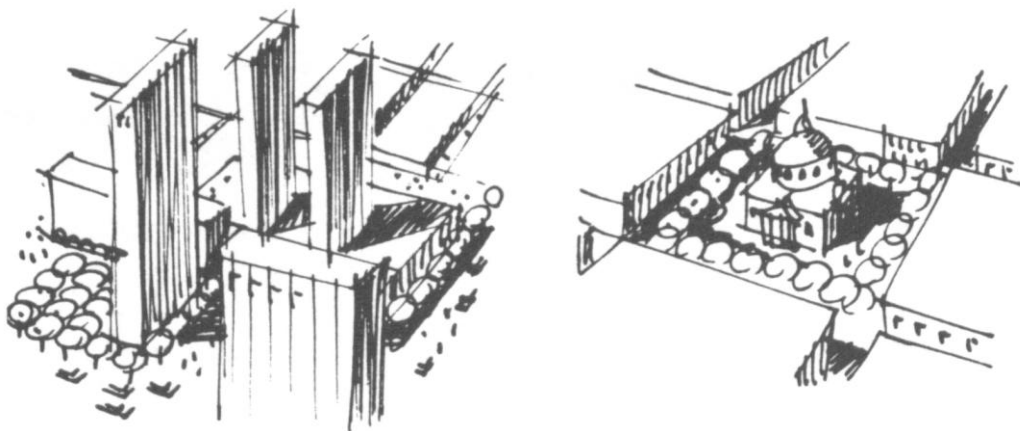
Figure: 2.14: Nodes, key elements Driven, www. ahbelab.com (2015.11.09)

5. Landmarks: refer to physical reference points. External elements such as towers are usually visible from many perspectives and distances prior to smaller elements. There are local landmarks such as sculptures, fountains, trees and so on that are visible in limited distances and from certain perspectives. Landmarks with more distinguished from that contrast the background is simply identifiable and more likely to be specific for observers. Lynch (1960) introduced singularity as the most important physical characteristic of a landmark, (Figure 2.15).

> Some aspect that is unique or memorable in the context', and that 'spatial prominence' can establish the elements as landmarks by making them visible from many locations and/or creating contrast with nearby elements. How an environment is used may also strengthen a landmark's significance: for example, its location as a junction involving path decisions. Lynch (pp. 78-9)

Figure 2.15: Landmark, key elements driven, http://ahbelab.com (2015.11.09)

All the elements that Lynch indicated are within the urban context and are not isolated. The combination of all these elements gives and overall image: structure of districts is based on nodes, while it is defined by edges, paths make access to a district and finally a district is spotted with landmarks. Generally, citizens move from various scales of image towards other images, from a street level to even beyond the city Passini, R. (1995).
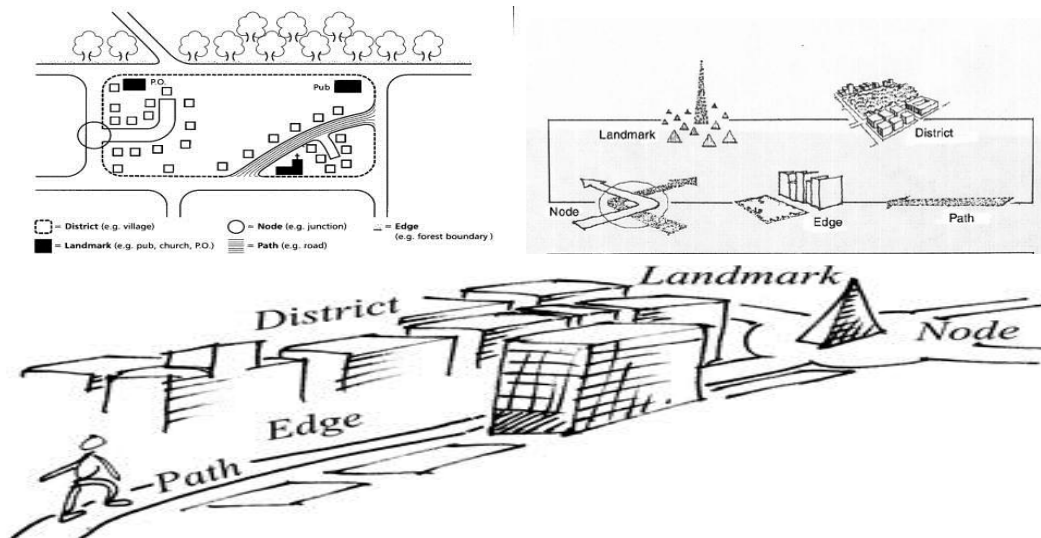
Figure 2.16: key elements driven, http://ahbelab.com (2015.11.09)

2.3.3 Landmarks and their Role in Way Fading

According to described elements of the city be Kevin Lynch (1960) and as it is mentioned above; landmarks are one of the elements that play an undeniable role in the perception of urban spaces and process of way finding. Since the focus of this study is on the effect of landmarks on the way finding in urban spaces, it is necessary to go through landmarks, their typologies and other data in order to use this information for the case studies and analysis (Figure 2.17).

Figure 2.17: Landmarks and their Role in Way Fiding,
http://www.moneymarketing.co.uk/ (2015.12.11)

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Colledge (1991) claimed that, people cope with environments within which they do activities in different ways. Variety of experiences of space are based on sources of information that people have personally and the information environment that provides for them. By the time of exposure to a new space, people learn to notice landmarks or prominent features of the environment. Elements like texture, shape and orientation of specific objects are kept in declarative knowledge structures, which allow people to get this knowledge (Bliss et. Al, 1997, p. 81).

Siegel and White (1975, p.499), defined landmarks as prominent environmental features that are in harmony or contrast of the neighborhood within which they exist. On the other hand (Golledge, 1999) stated that, landmarks are natural, built or features that are shaped based on the culture, which match their environment. Therefore, landmarks give the characteristics of a geographic location and build geographic routes with the formation of spots to reach or departure from, or paths through which someone can move. Lynch (1960), has made an informal attempt in order to characterize landmarks. According to his observations citizens describe their cities generally among five fundamental categories of urban features and their relationships: paths, edges, districts, nodes and landmarks. In his opinion, landmarks are physical objects with the role of reference points. Accordingly, any element of the physical environment that might help the orientation process, such as shops and schools, within the wayfinding process can be counted as a landmark.

Appleyard (1969, p. 98), worked on 'building' a specific type of landmark. He asked people to mention those buildings of their hometown, which they could memorize, better those other buildings. Analysis of the results chosen buildings exhibited significant qualities of form, such as size; specific assets of visibility such as the

prominence of viewpoint; and specific quality of meaning such as a unique use of the building. The results of his analyzes show that characteristics that are detected in landmarks, regardless of geographic measures, are important for local assessments and global assessments; or in a neighborhood or an entire city.

In addition to earlier sources, Sorrows and Hirtle (1999) recognized three basic types of landmarks:

- Visual landmarks: notable for their visual specificity, (Figure 2.18).

- Semantic landmarks: notable for their usage or meaning, (Figure 2.19)

- Structural landmarks: notable for their position in the environment structure, (Figure 2.19).
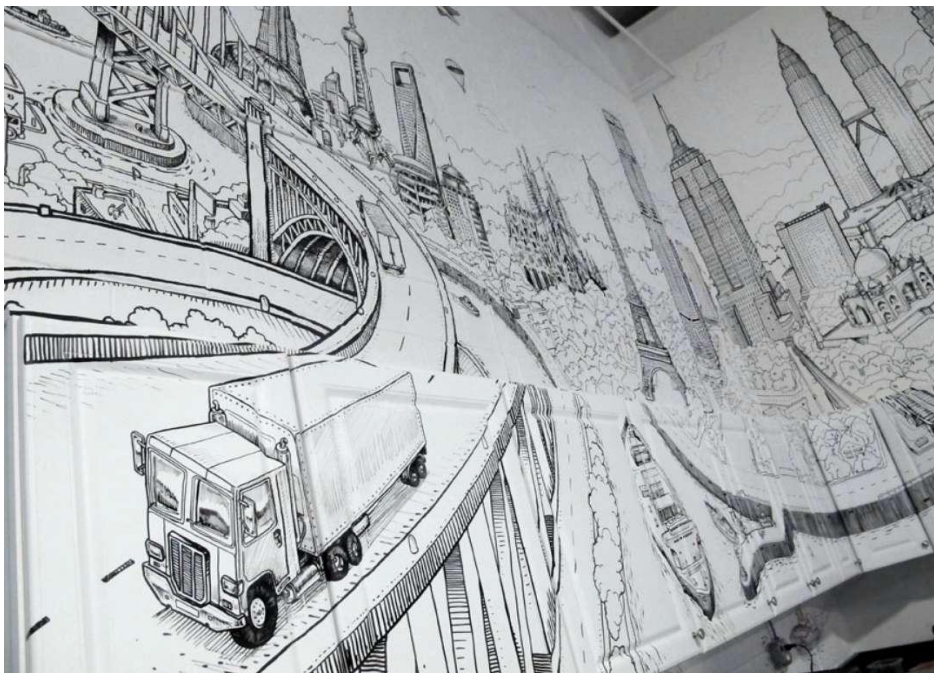
Figure 2.18: Visual landmarks, http://architizer.com (2015.10.08)

Figure 2.19: Semantic landmarks, http://www.dezeen.com (2015.10.08)

Figure 2.20: Structural landmarks, http://www.lego.com (2015.10.08)

A feature that fits within more than one category is capable of having a studio inclusive salience. Moreover, Sorrows and Hirtle (1999), stated that landmark quality is another characteristic, which is idealized for a person to access. This being idealized, which is called 'prototipicality', has been brought by the work of Rosch et al (1976). In their

work on 'radical categories' the center of one category is its prototype, and other members of that category can be labeled according to their similarity to that prototype.

Additionally, the literature on natural landmarks is very limited and little. Accordingly, a noticeable work is done by (Brosset et al., 2007), that indicate the land form as the second biggest category of landmarks in route directions within natural environments, if that land form is salient.

People learn how to understand the environment and identify landmarks from different perspectives by increasing their experience of that environment. Although they grow the ability to change the image based on their individual perspective, their original identification of the landmark is based on the first perspective from which they observed the landmark.

At the end it is worth to mention that, although some critics may suggest, but people do not supposedly concern about authenticity, or to say, they care about it less than how much they like a place. The important issue is their perception. Therefore, as Syracuse (2001, p. 3 1) claims:

> People enjoy both, whether it is a place created over centuries, or created instantly. A successful place, like a novel or a movie, engages us actively in an emotional experience orchestrated and organized to communicate the purpose and story.

Table 1: Classified landmark in the table

NAME	FUNCTION	MAP
LYNCH	Landmarks are one of the elements that play an undeniable role in the perception of urban spaces and process of way finding.	ENVIR EMEN → OBSE RVER → COGNITIV MAP
JACOBS	To understand the impact of urban design and urban elements, it is necessary to go through way finding, its elements and other related issues.	VISION or VISUAL THRESHOLD — ROUTE GENE — COGNITIVE MAP or MEMORY STABILITY
PASSINI	Way finding is the capacity to recognize one area and touch base at destinations or explore in special situations, both psychologically and behaviourally	PERCEPTION — ASSESSMENT — MOTIVETION

Chapter 3

3 COGNITIVE PROCESSES AND WAYFINDING IN URBAN SPACES

As it was explained in the previous chapter, Kevin Lynch is one of the pioneer theoreticians in terms of cognition in urban scale. In his influential publication of 1960 called "the image of the city", Lynch first applied the term "wayfinding" to explain how individuals, travel within the city using paths, edges, landmarks, nodes and districts (Figure 3.1). His static concept of spatial orientation was extended to a dynamic understanding of wayfinding by cognitive research in 1970. It was more associated with the process of collecting information and decision making by human. He tried to discover the relationship between the observer and their surroundings and also to understand how their image is built up. His aim was to investigate human's feelings and knowledge about the environment; and thus he recognized five elements that they mostly tend to choose from the environment for creating their images. He suggested that these elements create the criteria for an environment that is highly legible and imagable. In his work as the classic reference for cognitive mapping, Lynch created a methodology for studying cognitive maps based on questioning and field reconnaissance analysis (Bell et al., 2005, p.462).
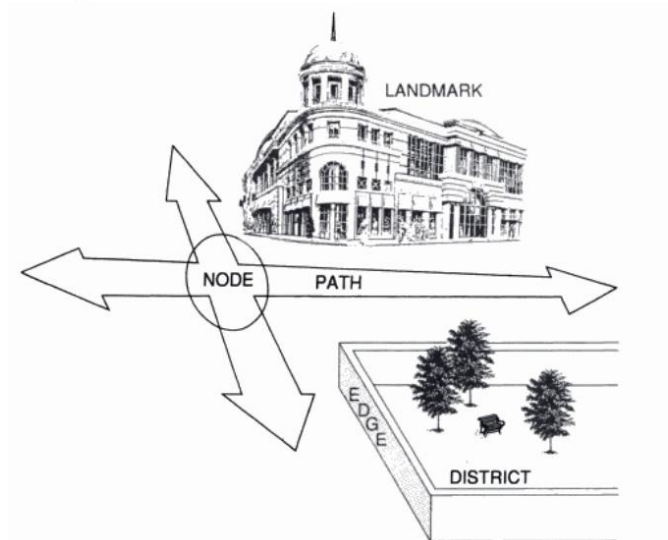
Figure 3.1: Five of Lynch's elements in a cognitive map (source: Bell et al., 2005)

This chapter is going to go through the theoretical knowledge about cognition and cognitive process. It will be a foundation for understanding and studying wayfinding as a process. Since the relation between wayfinding and urban design has been discussed in the previous chapter, this chapter aims to go through the theoretical bases of wayfinding specifically. At the end there are design principles for wayfinding, which can be considered as indicators for evaluation of the satisfaction in terms of wayfinding in an urban space.

3.1 Cognitive Processes in Urban Spaces

The environment provides a great part of people's knowledge and perception upon external information; and this information is enough for their basic actions. Therefore, their theme of cognition has an essential role in the studies on people- environment compatibility (S. Kaplan, 1983). The term "spatial cognition" was suggested to discover the cognitive process that is undertaken while one's activities such as navigation. Golledge, R. G. (1991,p.196).

3.1.1 Landmark Knowledge

There are various ways from which one can cope with the environments that encompass activities. The experience of a space varies based on the available sources of information and the information provided by the environment for people. By entering a new space people learn to identify landmarks or noticeable elements in the environment (Golledge, 1991). Features such as texture, form and orientation of specific objects are kept in declarative data structures, while they allow one to connect to this data (Bliss et. Al, 1997). For instance, by the arrival in a new city, certain buildings such as high rise buildings or important monumental elements are recognized by students (Figure 3.2).

Figure 3.2: The bean, Chicago, a form of Public art that is known and perceived as a landmark in the city of Chicago

By the rise of experience in a new environment, one can learn how to identify landmarks from new angles, which lead to building mental recognition and personal visualization of such elements in the environment (figure 3.3).
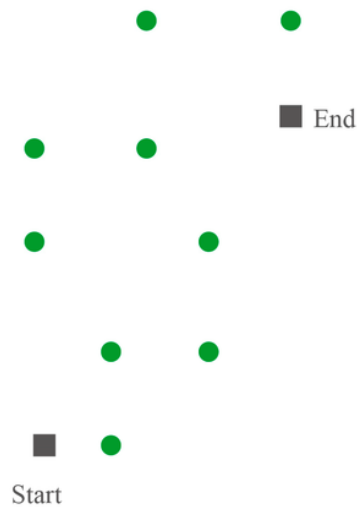
Figure 3.3: Landmark knowledge diagram, http://www.mdpi.com (2015.11.08)

By focusing on the role of landmarks in the process of navigation and way finding it is evident that landmarks are one of the primary tools in the process of way finding in the environment. Lynch (1997,p.75), states that:

> In the flow of way-finding, the important link is the environmental illustration, the universal picture of the outer physical world that is held by a person". Moreover, as stated by Downs and Stea (1973): "understanding navigation is an event consists of a series of psychological changes that acquires information for decoding a relative location using encryption in the context.

3.1.2 Route Knowledge

As it is clear how to relate individual landmarks to the other elements of the environment, declarative landmark knowledge becomes more valuable. In such process one builds up relationships between distance and orientation that makes it possible to identify routes joining landmarks. Route knowledge, usually refers to the knowledge about essential movements to make in order to get from one place to another (Rossano et al., 1999,p.46).

Navigation is frequently accomplished a purpose and for this reason route knowledge might be taken more important than landmark knowledge. Route knowledge representations include three key features as below:

- They are learned in the processes of accomplishment of specific tasks such as moving between a library and a classroom on a campus.

- They are represented from one's individual perspective, such as left and right turns, which are learned according to one's body orientation.

- They are independent from perspective, which means they work the most when they are used from the same perspective that they are (figure 3.4).
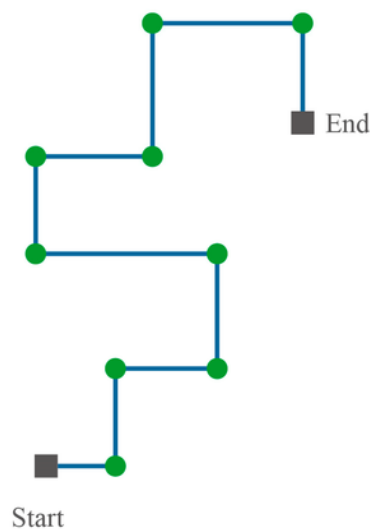
Figure 3.4: Route knowledge diagram http://www.mdpi.com (2015.11.08)

Passini (1995) claimed that, a person structures his/her spatial environmental knowledge, which come from the creation of plans for decision making during wayfinding; and also helps to identify the organization attitudes behind complex settings.

> Decision plans are the basis of linearly and temporally organized route-type representations, while spatial organization principles lead to spatial and survey-like representations. (Passini, 1995)

Accordingly, there is a significant term brought by Gordon Cullen (1996, p.10), called "serial vision". He indicated that the urban landscape is made of a series of connected tangible and intangible spaces aesthetically, and suggested that the planner will design more meaningful features if they understand the relation between tangible and intangible. With the "serial vision", he recognized and characterized the aesthetic mechanisms in the city by documentation of the dynamic interaction between the collective form and the space within which it is posited Gordon Cullen (1996, p.58). By his approach, Cullen puts emphasis on the significance of personal and collective visual experiences. While he theorized that to create a vivid city this type of information plays an undeniably important role. About his vision he claims that:

> The Concise Townscape explores the experiential relationship between the resident and the city, classifying this relationship into three categories: optics, place and content. (Cullen 1996: 9–12)

Optic is a concept in serial vision that encompasses movement at an unchanging speed within a city; and holds an existing view while keeping clues of any possible emerging views on a path or within a courtyard (Cullen 1996, p.60). The second, which is *placed*, concerns people's reactions to the position of their body within its surroundings (Cullen 1996, p.69). Residents become able to identify and understand the environment by this location consciousness; and it facilitates evocative navigation through the city (Cullen 1996, p.73). He refers to *content* as aesthetic of the place, which encompasses visual setting by use of color, texture, scale, style, character, personality and uniqueness (Cullen 1996, p.102). According to him, these types of categorization help to have a better realization of the urban form; and more than that:

"Their use demonstrates the potential of non-traditional resources (architectural detail, natural features, enclosures, relationships and scale) for informing a plan-making process that is sensitive to residential desires and respectful of the character of the space". (Cullen 1996: 57–86).
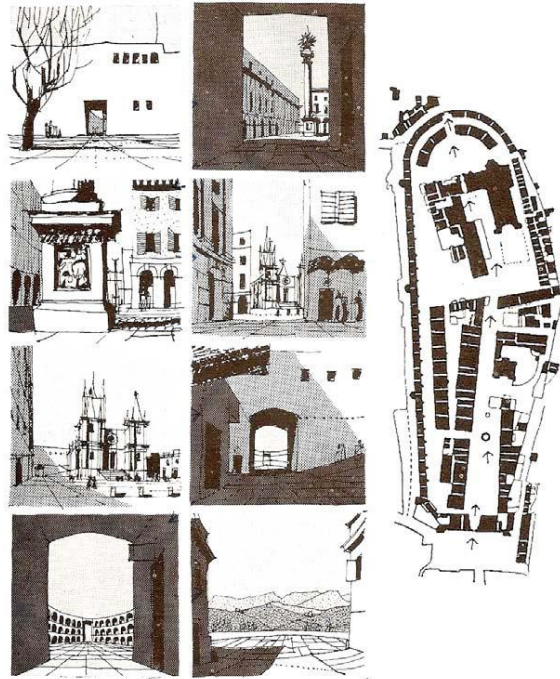
Figure 3.5: Cullen's serial vision; depicting aesthetic meaning, movement and emerging views (source: Cullen 1996: 17).

3.1.3 Survey Knowledge

One develops a more transformative configurational representation of a space when they become familiar with an environment (Golledge, 1991). The spatial relation between this structure and landmarks comes separate from routes that connect them. Therefore, route- defined representations are converted into more globally accepted relations, according to a world coordinate system (Golledge, 1991).
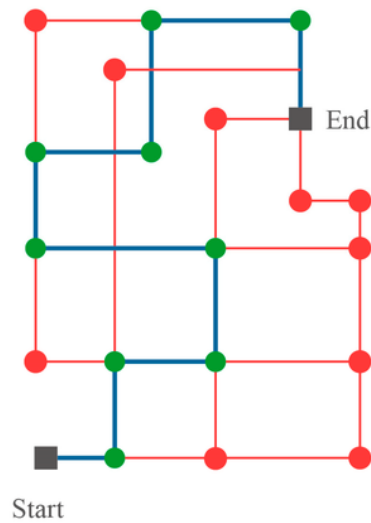
Figure 3.6: Survey knowledge diagram http://www.mdpi.com (2015.11.08)

Survey knowledge is based on the cognitions that one makes between the existing landmarks and routes in order to understand the environmental structure and navigate by distinguishing and making choices (Figure 3.6). According to Darken (1996) and Golledge (1991), there are two main methods through which this type of representation can be created; and these methods are different from the perspective that is applied while learning. The first method takes place when map study leads to learning spatial representations; and in a place where viewpoints are from an altitude above the scenery. The second method is explained by the continuous exploration and navigation of the environment from the walker's perspective. The second method is healthier and produces usable information (Tlauka and Wilson, 1996).

Table 2: Cognitive Processes in Urban Spaces
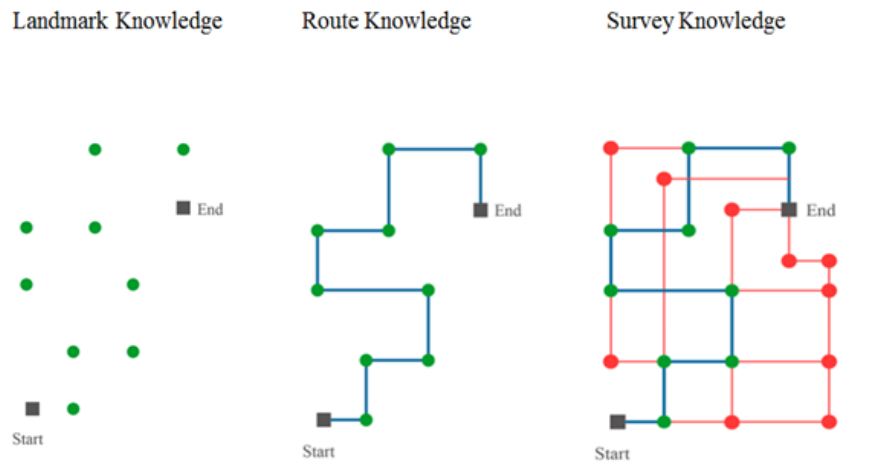
3.2 Theories and Factors Related to Wayfinding

Like any branch of knowledge, there are theories supporting the knowledge of wayfinding; and there are factors, which put direct effects on the wayfinding process and its qualities.

3.2.1 Theories about Perception

Speculations of observation shed a light on the issue of spatial nature as they clarify the way we secure and review data. Learning about the earth (level of spatial commonality) that might be communicated in verbal structure or in pictures and psychological maps coordinates a man's observation, his data preparing. The impression of the environment is coordinated by what a man knows (past experience) and in addition of what he needs. Environmental information is gotten through perceptual procedures that are guided by schemata propelled by necessities. These schemata are in part intrinsic and in part taught (Lang, 1987). They frame the linkage in the middle of observation and cognizance. They manage the perceptual procedures as well as passionate reactions and activities, which thus influence the schemata as the results of conduct that are observed. Human sentiments and activities are restricted by the affordances of the normal and constructed situations, the social environment, and

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the intra-psychic conditions of the general population concerned. The clarification of these procedures of conduct is guided by a general idea called the "ecological discernment and conduct approach" Lang, J. (1987, p.333). Inside of this methodology, there are distinctive speculations of discernment. Three noteworthy understandings of the procedures of observation are Gestalt, Transactional, and Ecological Theory, Lang, J. (1987, p.340).

Gestalt theory has most influenced the ideas of environmental designers more than any other perception theory. Gestalt psychologists compiled a list of factors that influence the perception of form, Humphrey, G (1924). This theory includes laws as named below:

- Laws of similarity
- Law of Goodness or Pragnanz
- Law of Closure
- Law of Figure-Ground
- Law of Proximity
- Law of Continuity

By hypothesis, protests that are near one another have a tendency to be gathered together outwardly, this is the law of closeness. The law of closeness applies if components have comparative qualities - size, surface, shading, etc.

Figure 3.7: Law of similarity in Gestalt theory http://firm-ad.com - (2016.01.04)

The law of closure expresses that optical units have a tendency to be formed into shut wholes (Figure 3.7 and 3.8). The law of good continuance expresses that individuals have a tendency to see constant components as single units (Figure 3.9). The law of figure ground recommends that the littler a shut zone the more it has a tendency to be seen as a (Figure 3.10). The law of proximity cases that the more symmetrical a shut region the more it has a tendency to be seen as a (Figure 3.11). The law of pragnanz recommends that territories with shut shapes have a tendency to be seen as units more for the most part than those without them (Lang, 1987, p. 341) (Figure 3.12).

Figure 3.8: Law of closure in Gestalt theory http://firm-ad.com (2016.01.04)

Figure 3.9: Law of good continuance in Gestalt theory http://firm-ad.com
(2016.01.04)

Figure 3.10: Law of figure-ground in Gestalt theory http://firm-ad.com (2016.01.04)
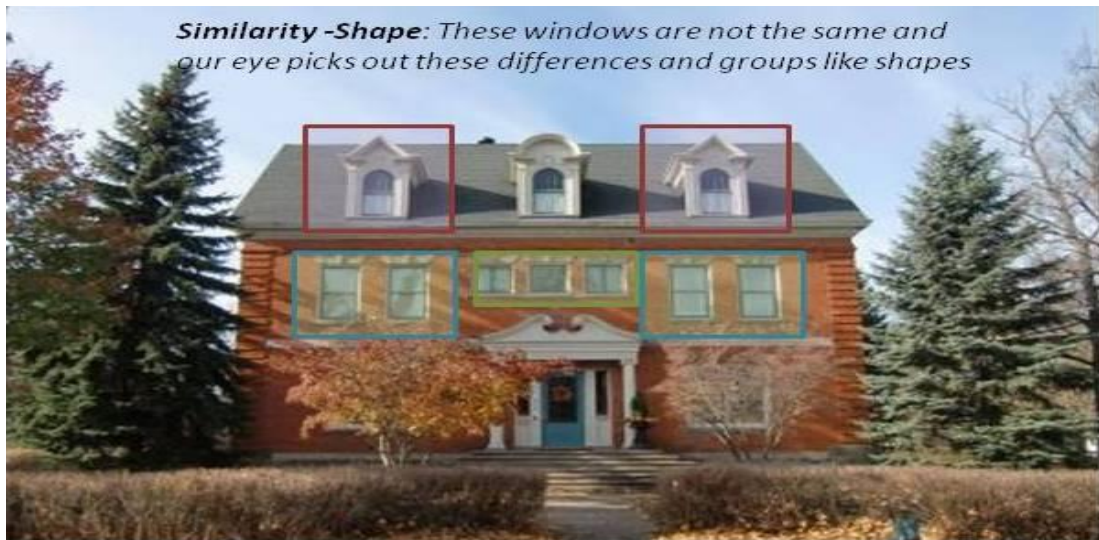
Figure 3.11: Law of proximity in Gestalt theory
http://www.vestaproperties.comheaders(2015.09.10)

Figure 3.12: Law of Prognanz in Gestalt theory, http://www.iranreview.org
(2015.09.10)

Transactional theory underscores on the part of involvement in observation and spotlights on the dynamic relationship in the middle of individual and environment. Recognition is thought to be an exchange in which nature, the eyewitness, and the observation are commonly reliant on one another (Lang, 1987). Transactional theory makes various presumptions about the procedures of discernment (Lang, 1987, p. 90). These are as per the following:

1) Perception is multi-modular,

2) Perception is a dynamic procedure,

3) Perception is not clarified by isolating conduct into the perceiver and the apparent,

4) Perception can't be clarified as far as molded reactions to jolts,

5) The individual - environment relationship is a dynamic one,

6) The picture of the environment that a spectator relies on upon past encounters and also on present thought processes and states of mind,

7) Past encounters are anticipated onto the current circumstance in relationship to one's needs,

8) Perception is represented by hopes and inclinations (Lang, 1987, p. 90).

Moreover, there is the ecological way to deal with perception, which negates with Gestalt hypothesis and the transactional interpretation of the part of involvement in discernment. Rather than considering the faculties as channels of sensation, it views the faculties as perceptual frameworks (Lang, 1987). Individuals investigate the earth to see the better points of interest by moving their eyes, heads, and bodies. With experience, a man can recognize the better subtle elements of the world and more extensive connections, and figures out how to pay consideration on points of interest of the world that were not going for some time recently. Keeping in mind the end goal to see the structure of nature, perceive that a few surfaces of the world conceal others.

At the point when a man travels through the earth, one vista after another is seen. This happens in moving from space to room in a building, or when achieving the edge of a road. The mental investigation of the part of development is one of Gibson's significant commitments of the biological recognition hypothesis (Gibson, 1979, p.42).

Lang (1987, p. 96) takes note of that the capacity to see a portion of the affordances of environments is by all accounts inborn or a component of physiological development of individuals. Others are found out through experience or by having one's consideration conveyed to them. To recognize meaning, a spectator does not need to take care of each variable contained in the optic exhibit. Consideration is specific, individuals take care of what they think about and what they are propelled to perceive.

Cognitive psychology manages the procurement, association, and capacity of learning. It concentrates on issues of considering, learning, recollecting, and mental advancement. Human conduct is exceptionally plastic. Individuals have a great ability to adjust to new built environments, to adjust the fabricated situations to their requirements, and to learn new tasteful qualities. The procedures key to this versatile capacity are learning, recalling, and summing up. Learning happens when an individual partners another reaction to a given jolt, bringing about a perpetual change in conduct (Lang, 1987, p. 81). What we realize includes either inward or other support. This applies to ecological dispositions that influence the future conduct and in addition to action designs. A few things are overlooked while others continue in memory.

Recollecting and overlooking are serious concerns; the way people utilize structures and urban areas depends incompletely on how well their structures are recalled from

past visits (Lynch, 1960; Appleyard, 1969; Passini, 1984a). Lang (1987) states that a few things are less demanding to recollect than others; the rate at which we overlook things relies on upon their significance to us, how very much sorted or composed they are, and how degenerates they are from the standard. Additionally, the way we arrange things can either help or misshape memory; and the capacity to figure out how to utilize classes relies on upon the intellectual procedures of speculation produced using past encounters. Golledge (1999, p. 122) states that rehashed way, taking after encouraging recollecting the way segments and reviewing them for later utilize (IE, course learning). Ways or courses are spoken to as one dimensional connected fragments or, after joining with different ways, as arranged designs. The last mentioned, alongside points of interest, the spatial relations among them, and other spatial and non-spatial components of spots, make up the recollected design of an accomplished domain. As far as special recognition, how well we recall elements of the based environment relies on open the configuration standards considered in the setting, and our individual capacity to learn, retain, classify, and sum up what have been learnt beforehand.

Table 2: Theories related to wayfinding

Theory of perception	Focus of the Theory	Further Explanations	Scholar Main
Gestalt	Influential factors of the perception of form	Observation	Lang.J(1987)
Transactional Theory	The role of experience in perception	Mental Maps	O' Neill, M. J
Ecological approach to perception	Considering senses as perceptual systems	Perceptions through Human senses	Golledge. R.G (1999)

3.3 Design Principles for Wayfinding

Considering urban features and elements, and also focusing on wayfinding in an urban environment, it appears that efficient use of design principles regarding too wayfinding will improve the performance of mentioned spaces accordingly (Passini, 1992, P. 198).

This arrangement of outline standards is concerned making data spaces successfully exploring. Safety implies that the pilot can effectively move in the data space from his present area to a destination, regardless of the possibility that the area of the destination is loosely known. Three criteria decide the safety of a space: to start with, whether the guide can find or derive his present area; second, whether a course to the destination can be found; and third, how well the pilot can amass wayfinding background in the space (Foltz, 1998, P .304).

The first criterion, productive recuperation of the area and introducing, inquires as to whether one can absolutely answer the inquiries, where am I?" and which way am I confronting?" A reaction to these inquiries could be verbal, for example, ``I am in Hall 7, confronting Massachusetts Avenue3,'' or composed, by drawing a sign on a guide of the surroundings (Foltz, 1998, P. 301).

The second is the criterion for navigability deals with the capacity to effectively perform wayfinding undertakings. Effective wayfinding happens when one can settle on right navigations that take him from their present area to a destination that satisfies his biggest reason. Samples of such choices are whether to proceed with the present course or to backtrack, what swing to take as a crossing point of ways, or whether to prevent and acquire data from nature to affirm the present route. Arthur and Passini call wayfinding spatial critical thinking (Arthur and Passini, 1992, P .189), in which the guide finds a tasteful answer for a bigger assignment through route.

The third criterion for navigability refers to the manner by which well the guide can collect wayfinding background in the space. The imageability of a huge scale space is the capacity of a guide to shape an intelligent mental picture or guide of it. Kevin Lynch, an urban organizer, initially examined how the qualities of an urban space influenced how well individuals recalled highlights in it (Lynch, 1960, P.60). Lynch talked with inhabitants of Boston, Los Angeles, and Jersey City, New Jersey, and solicited them to draw sketch maps from their city from memory. From these portrayal maps and verbal meetings Lynch looked at the imageability of the urban areas: how well the representation maps and meetings mirrored the genuine format of every city. Lynch (1960) found that the respondents composed their city pictures utilizing an

arrangement of normal elements: ways, historic points, districts, edges (hindrances), and hubs (crossing points) Lynch (1960, p .37).

What makes Lynch's discoveries, particularly fascinating is that the imaginable or critical components of a space are utilized by individuals to help wayfinding. Landmarks are vital areas that situate the pilot; districts are particular regions that place him in one part of nature; and hubs mark focuses where wayfinding choices are made. Subsequent to a guide's use these components to record his past course taking after encounters, an outlined space that utilizes them ought to be all the more adequately safe.

These last two criteria, wayfinding capacity and imageability, have unique pertinence for data spaces. Wayfinding within an information space, we have contended, ought to compare with data looking to conduct in a data access environment. Effective wayfinding then suggests that the client can utilize the data access environment to satisfy his data need. In a traversal data space, the issue of being "lost in hyperspace" (Edwards and Hardman, 1993) could then be tackled.

The principles here come from both the study of museum exhibits and the research of environmental psychologists, cognitive scientists, and others who study how humans represent and navigate in the physical environment.

Principles of operative wayfinding include: (Edwards and Hardman, 1993, p.163)

- Creating a unique identity at each place
- Usage of landmarks in order to provide orientation cues and notable scenes.
- Generating well-structured paths.

- Creating areas of divergent visual characteristics.

- Giving limited navigation choices to people

- Use of survey views (giving navigators a map)

- Providing signs located at decision points for helping wayfinding decisions

- Using sight lines for showing what is on the way

A well designed urban pattern considers the elements that make cities more readable for citizens. This means that to face a successful wayfinding process, multiple factors are to be considered and design principles should be applied. The factors, theories and design principles related to wayfinding have been already discussed within this chapter and previous chapter. These studies prepare a suitable ground for running an analytical case study to find pros and cons related to wayfinding in any urban space. (Arthur and Passini, 1992, P. 187) .

To summarize, this chapter tended to discuss the process of wayfindi ng based on related theories and related factors to the process of wayfinding; and to find out about the principles of design for wayfinding. So, the next chapter will benefit from the data gathered in order to evaluate the qualities of wayfing in case studies. (Arthur and Passini, 1992, P .192)

3.4 Wayfinding process for children

At the point when Piaget discussed the improvement of a man's mental procedure, he was alluding to increments in the number and diverse nature of the schemata. At the point when a child's current patterns are equipped for clarifying what it can see around it, it is said to be in a condition of harmony, i.e. a condition of intellectual (i.e. Mental) equalization. Piaget underlined the significance of patterns in intellectual improvement

and depicted how they were produced or obtained. A pattern can be characterized as an arrangement of connected mental representations of the world, which people utilize both to comprehend and to react the circumstances. The presumption is that people store these mental representations and apply them when required. (Foltz, 1998, P.301).

Since Piaget focused on the general phases of psychological improvement and natural development, he did not consider the impact that the social setting and culture might have on intellectual advancement. (Foltz, 1998, P.308).

Piaget's Theory

Jean Piaget is a French psychologist whose work has been mostly focused on children's psychology. His contributions to children's psychology was:

• The main "psychological" hypothesis, was created by Jean Piaget starting around 1920.

• Piaget watched and depicted children of diverse ages.

• His hypothesis is extremely wide, from conception through youth, and incorporates ideas of dialect, experimental thinking, moral advancement, and memory (Santrock, J.W. 1995, p. 89).

Piaget's Assumptions About Youngsters

• Children develop their own insight in reaction to their encounters.

• Children realize numerous things without the help of more experienced youngsters or grownups.

• Children are characteristically inspired to learn more, without need to get gifts from grownups to motivate for learning, Siegler, R. (1991,p.63).

Nature versus Support

• Nature and support interface to create intellectual improvement.

• Nature: development of the cerebrum and body; capacity to see, learn, act; inspiration

• Nurture:

− Adaptation: Children react to the requests of the environment in ways that meet their own objectives.

− Organization: Children coordinate specific perceptions into an assemblage of rational, Vasta, R., Haith, M.M., & Miller, S.A. (1995,p.60).

Persistent versus Intermittent

• Sources of coherence:

− Assimilation: People make an interpretation of approaching data into a structure they understand.

− Accommodation: People adjust current information structures in light of new experience.

− Equilibration: People parity absorption and ability to make stable comparison, Vasta, R., Haith, M.M., & Miller, S.A. (1995, p. 69).

Constant versus Broken

Wellsprings of brokenness: There are particular phases of psychological advancement, with the taking after properties.

− Qualitative change: Children of various ages (and at distinctive stages) think in various ways.

− Broad relevance: The sort of intuition at every stage invades theme and substance regions.

− Brief moves: Transitions to the higher phases of deduction are not as a matter of course consistent.

− Invariant grouping: The successions of stages are steady for all individuals through record-breaking, Santrock, J.W. (1995, p.34).

Piaget's Stages

• Sensorimotor stage (conception to 2 years)

• Preoperational stage (2 to 7 years)

– Knowledge is spoken to by the dialect, mental symbolism, what's more, typical thought. Children can contemplate solid occasion sand can reason abstractly and speculatively (Jean Piaget. 1970, p. 302).

According to Piaget, the child begins to understand space from the age of 7.

Table 3: Piaget's Stages
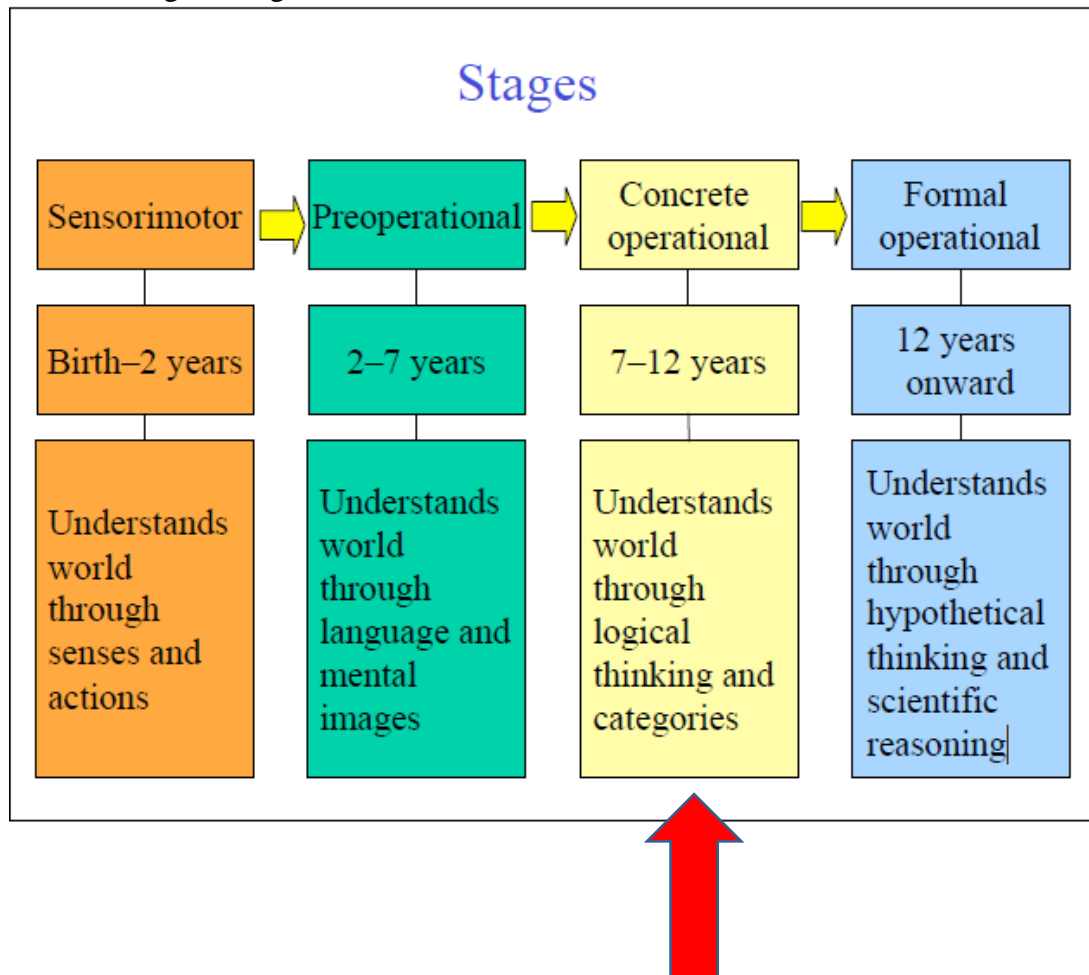
According to the above tale, this study has chosen the age range of 7-12, since children start to have their understandings of the world by using their logical thinking.

At the age of 7 childeren start the primary school, wich is the sirst stage of their lives within wich they take responsibilities for themselves.Although thay are conducted by teachers and are trained for life experiences together with primary reading,writing and studing abilities;but at this stage they start to discover and challeng with the daily life .Accordingly during the primary school period childeren develop understanding of the envirenment, society, built environment, social interactions and many other issues;and start to lern how to build up their own perception of spaces based on the received information from the environment and their personal abilities.Mapping urban spaces and identifying the built environment improves because at this stage of their lives children become sensitive in order to personally involve with the world. Wayfinding is a very important issue in this respect, because they need to be able to recognize the process of moving from one place to the other by identifying signs and routes in the urban spaces.

Conclusion chapter 3:


```
Cognitive Process and Wayfinding
        in Urban Spaces
│
├─── Cognitive Process in Urban Spaces
│        ├── Landmark Knowledge
│        ├── Route Knowledge
│        └── Survey Knowledge
│
├─── Dimensions of Wayfinding
│        ├── Cognitive Mapping
│        └── Legibility
│
└─── Theories and Related factors to Wayfinding
         ├── Perception
         └── Effective Factors in Wayfinding
```
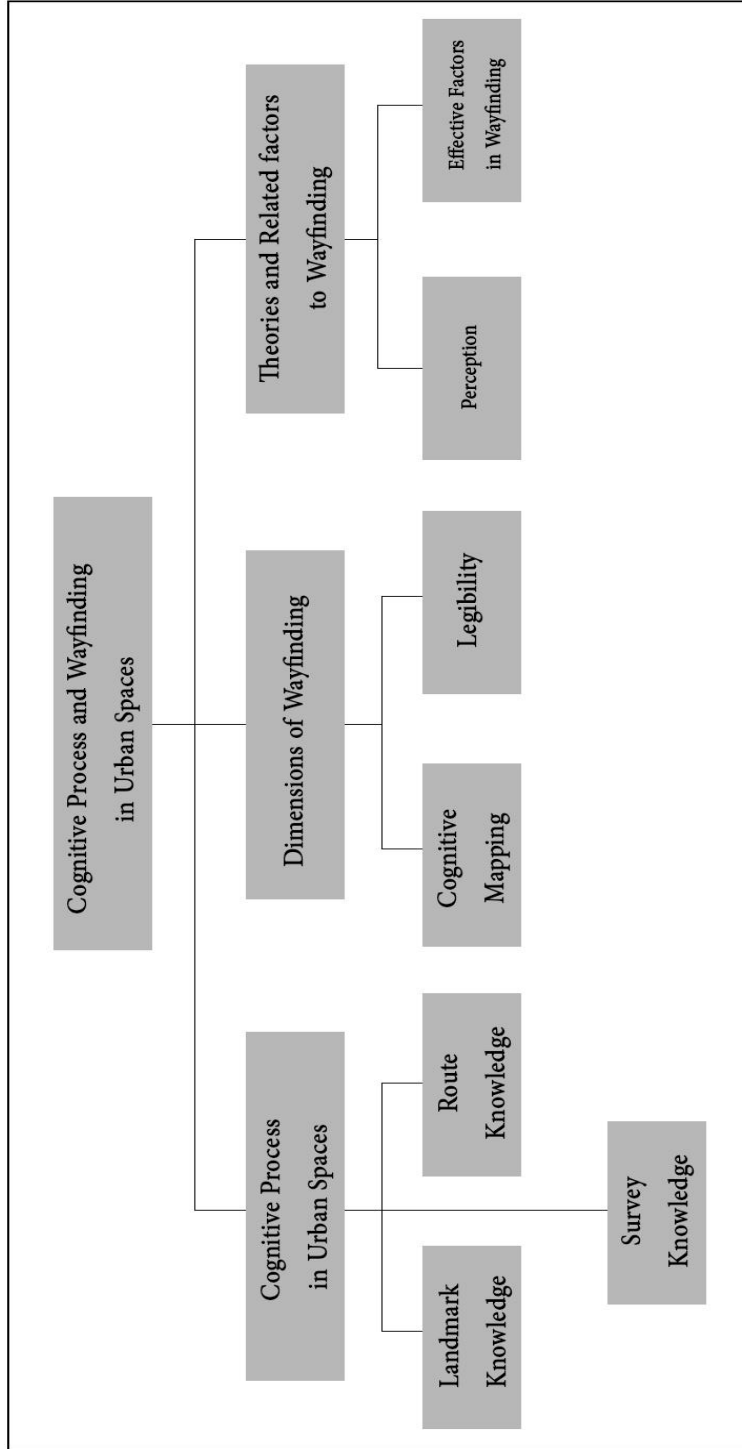
Design Principles for Wayfinding

Table 4: Cognitive Process and Wayfinding in Urban Spaces

Chapter 4

TESTING THE WAYFINDING METHOD ON PRIMARY SCHOOLS

4.1 Introduction

This chapter describes a case study. Chapter 5 includes arguments on quality of spaces around and perception of the landmark, especially the viewpoint of children (between about 8 to 12). The issue of understanding the environment is described according to visual imagination, metric properties, and perceptions of the landmarks in an environment. These issues are reflected in a case study, which is conducted in primary schools in Famagusta and Nicosia in North Cyprus. The sample group is the total of 170 students, which include students from third and fifth grades. The reason for choosing this age group is that, according to Piaget, children from age 8 start to understand space for the purpose of way-finding and at this age they know writing and studying. This chapter will investigate the importance of Landmark for this age group, divided into female and male groups, in order to proceed wayfinding in urban spaces.

4.2 Case Studies and Methodology of Comparatison

Comparing the different cases in traditional and newly developed districts will be helpful in order to find out the spatial qualities of traditional and contemporary spaces by focusing on cognitive mapping and legibility analyses.

4.2.1 Criteria of Selection for Case Studies

Cases are selected from Nicosia and Famagusta because:

- Both of the cities have historical core;

- Both of them encompass contemporary social housing districts;

- Both districts include a primary school within walkable distance;

- Selected examples proximity is carrying same characteristics.

4.2.2 Methodology of Analysis the Case

Method of case analyses is based on interviews, observation, and data analysis in order to maintain the cognition. Drawing, photography and SPSS program are tools to test the data.

Cognitive Mapping:

Regarding to the criteria of wayfinding design, which were mentioned in the previous chapter, intervals are based upon the features that affect navigability. Children are interviewed in order to extract information about the qualities of their wayfinding abilities and navigational skills, and cognition of environments.

Interviews

Accordingly, students are interviewed in order to give information about how is their cognitions of the routes.

Before they start to draw the maps **questions** are asked from the students in order to help them to understand their expectations. The following questions are asked from students:

- What type of buildings, trees, or paved surfaces take your attention while you are travelling from home to school?

- If you change your daily route, what type of references are you able to put in order to remember your way.

In order to secure to get the some missing points from the map the questions on able ask the children verbally.

Observation Method

In order to understand the perception of closed environment, student has been asked to stand at the school entrances and point out the important things in the surroundings.

Data Analysis

The method used to understand the cognitive equations of the research by using the" SPSS" program.

Charts of Methods and tools:

Table 5: Methods and tools

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                    ┌──────────────────────────────┐
                    │   Cognitive map analysis     │
                    └──────────────────────────────┘
        ┌──────────────────┬──────────────────────────┐
┌───────────────┐  ┌────────────────┐        ┌────────────────┐
│  Interviews   │  │  Observation   │        │  Data analyses │
└───────────────┘  └────────────────┘        └────────────────┘
┌───────────────┐          │                          │
│ Questionnaire │          │                          │
└───────────────┘          │                          │
┌───────────────┐          │                          │
│  Mentalmaps   │          │                          │
└───────────────┘          │                          │
┌───────────────┐  ┌────────────────┐        ┌────────────────┐
│   Drawings    │  │  Photography   │        │  Spss program  │
└───────────────┘  └────────────────┘        └────────────────┘
```
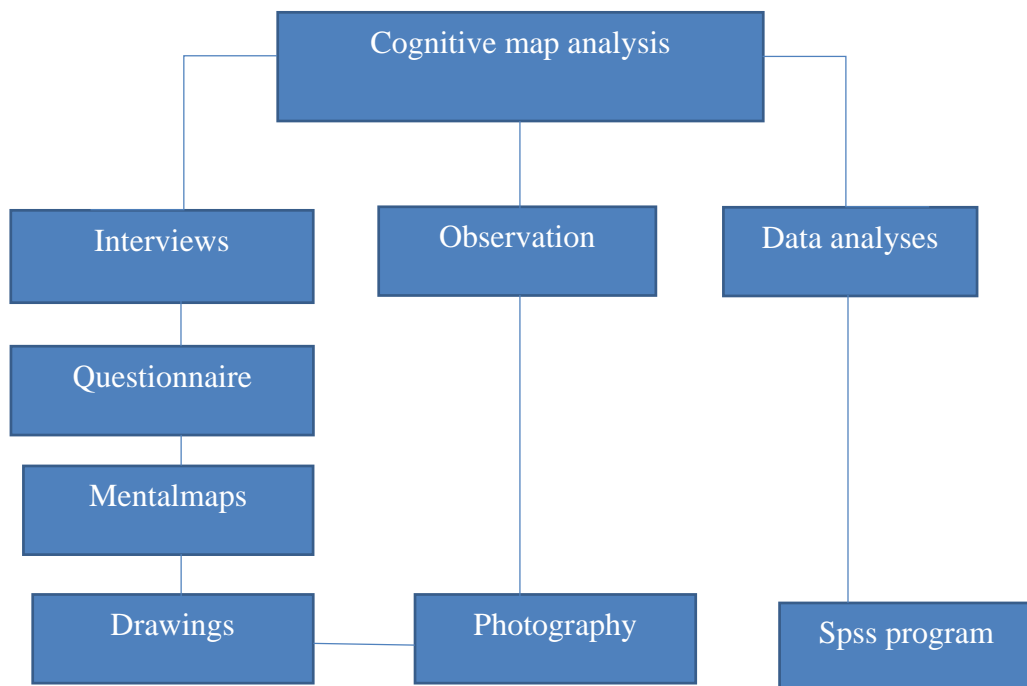
4.3 Sample Groups

The sample study group was formed by 170 primary school students in North Cyprus. Two groups of them in Famagusta and two groups of them in Nicosia. As the experiment, children were chosen by factors of age, gender (see Table 4.3). The investigation did not focus on the impacts of age, so all members were peering: primary school third grade, matured (8-9) and Fifth Grade, matured (11-12) years of age. Since recognition has an essential role in the experiment, some students are taken to school by their parents (via car or strolling); and some other children were themselves on their own (strolling or school transportation). The test was led by four distinctive specimen bunches for the four diverse test sets.

Table 6: Participant Numbers on the Basis of Experiment Sets and Gender

		Female	Male	Total
EXPERIMENT SETS	Student of Gazi	23	21	44
	Student of Ataturk	22	20	42
	Student of Alasya	21	22	44
	Student of Necati Taşkin	21	22	42
Total		86	84	170

4.3.1 Nicosia

Nicosia has a long, various and, in some cases, turbulent history that is reflected in its urban and design organization, most notably in its noteworthy walled center, Alford, Jonathan (1979,p. 18). It encountered hundreds of years of outsider invasions– Ptolemaic, Roman, Byzantine, Crusader/Lusignan, Venetian, Ottoman and English – before turning into the capital of a free Cyprus in 1960. In 1974, clash in the middle of Greek and Turkish Cypriots prompted the city being divided into two, with each part retained into a different political substance. The southern, Greek area of the city kept on being the capital of the Republic of Cyprus, while the northern segment in the long run turned out to be a piece of the new Turkish Republic of Northern Cyprus, which just Turkey perceives as a state. A buffer zone isolates the two parts of Nicosia and goes through the focal point of the walled city, taking up around 10 for each part of its territory. Alford, Jonathan (1979, p. 19).

The present city divider was built by the Venetians somewhere around 1567 and 1570 to supplant the prior medieval dividers. It was planned to secure the city against a foreseen Ottoman intrusion, however the Ottomans learned how to catch the city not exactly a year after its fulfillment. In the arrangement, the divider is described by its unique geometric layout, which comprises of a circle with eleven just as separated point molded bastions distending out of it. Following the 1980s, impressive endeavors have been made to secure the structure and urban legacy of the walled city furthermore to address its weakening, particularly in the zones circumscribing the buffer zone. What endeavors these endeavors surprising is that they have been done by the civil powers of both the Turkish and Greek divisions of the city, who have shaped a joint Nicosia Master Plan (NMP) group. This activity was the first (and for quite a while the main) basic undertaking completed by the two groups. It has been managed since

its origin up to the present in spite of times of political disorder (Dreghorn, William 2015,p.2).

4.3.1.1 Neighborhood Compositional Character

The walled city has a decisive urban fabric. The structures are built by delicate yellowish stones and of sun-dried bricks. They run in size as indicated by capacity.

Religious and other open buildings are the biggest and most predominant structures; while houses are for the most part approximately two stories high. There is a differing quality of building styles, mirroring the different times of Nicosia's history: Byzantine, Gothic and Ottoman, and additionally later vocabularies going from the neo-established to the pioneer (Attalides, 1981, p. 28).

Architecture and urban context have changed as follows in Nicosia:

The walled city: The walled city of Nicosia is exceptionally rich ever, culture and engineering. The northern part is wealthier in chronicled structures and social works, with its Selimiye quarter holding its complete authentic character and atmosphere. The walled city by and large has been announced a secured region by the Turkish Cypriot Department of Antiquities. (Dreghorn, William 2015,p.2).

The walled city of Nicosia is exceptionally rich ever, culture and engineering. The northern part is wealthier in chronicled structures and social works, with its Selimiye quarter holding its complete authentic character and atmosphere.The walled city has been announced a secured region by the Turkish Cypriot Department of Antiquities. The Girne Avenue interfaces Sarayönü to the Kyrenia Gate and the İnönü Square before it. The parkway has been depicted as "the image of the walled city", and is loaded with various shops and restaurants. (Attalides, 1981, p. 28).

Close to the passageway of the walled city, toward the west of the Girne Avenue, lies the Samanbahçe neighborhood, worked in the nineteenth century by the administration, thought to be the main case of social lodging in the island. The houses are uniform and bordering, and at the focal point of the area is a memorable wellspring. (Dreghorn, William 2015,p.6).

Close-by Büyük Han, the biggest caravanserai in the island and thought to be one of the finest structures in Cyprus, was inherent 1572 by the Ottomans. The building has 68 rooms and a little mosque in the center, and as of now capacities as a traveler frequented social focus, with the keepsake and workmanship shops, bistros with conventional sustenance and social exercises, for example, little scale musical show concerts. Just opposite the street is the Kumarcılar Hanı (Gamblers' Inn), worked in the seventeenth century as an average sample of Ottoman exchanging hotels. (Attalides, 1981, p. 40).

Another main issue in the walled city is the Selimiye Mosque, initially worked as the St. Sophia Cathedral. The mosque is the boss religious focus in Northern Cyprus. It was working somewhere around 1209 and 1228 in the Latin Church of Cyprus, in a Gothic style looking like French houses of prayer. Its segments are more seasoned, from the Roman time, showing the conceivable vicinity of a Byzantine church before its development. It used to be the spot of the crowning liturgy of Lusignan rulers and was changed over to the biggest mosque in the island by the Ottomans in 1571. (Attalides, 1981, p. 47).

Metropolitan area: Outside the walled city, North Nicosia has extended to end up a huge city, with an urban zone that has consumed the neighboring town of Gönyeli and the previous town of Hamitköy that is a piece of the Nicosia Turkish Municipality. The bigger North Nicosia metropolitan region by definition incorporates the Haspolat area which is additionally thought to be a part of the city legitimate as it is inside of the Nicosia Turkish Municipality locale, the district of Alayköy and the town of Kanlıköy under the ward of Gönyeli, where North Nicosia is anticipated to develop. The metropolitan territory has a range of 165.2 square kilometers. (Attalides, 1981, p. 59).

Figure 4.1: Green Line, northern and southern parts of the Nicosia (map from Google).(2015.11.12)

4.3.2 Famagusta

Mağusa or Gazimağusa is a city on the east shore of Cyprus. It is located on the east of Nicosia, and has the most profound harbor of the island. Neighborhood compositional character the walled city has a firmly weave urban fabric. The structures are developed of a delicate yellowish stone and of put sun-dried block. They run in size as indicated by capacity , Kinross, Lord (2002, p. 64).

Religious and other open structures are the biggest and most predominant while houses are for the most part approximately two stories high. There is a differing quality of building styles, mirroring the different times of Nicosia's history: Byzantine, Gothic and Ottoman, and additionally later vocabularies going from the neo-established to the pioneer, Dreghorn, William (2015,p. 51).

Architecture and urban context have changed as follows in Famagusta:

1. Medieval Famagusta, 1192–1571

2. Ottoman Famagusta, 1571–1878

3. British rule, 1878–1960

4. After 1974.

Medieval Famagusta, 1192–1571: The defining moment for Famagusta was 1192 with the onset of Lusignan tenet. It was amid this period that Famagusta created as a completely fledged town. It expanded in significance toward the Eastern Mediterranean because of its normal harbor and the dividers that secured its inward town. Its populace started to increment. This improvement quickened in the thirteenth century as the town turned into a focal point of trade for both the East and West. A convergence of Christian displaced people escaping the defeat of Acre (1291) in Palestine changed it from a little town into one of the wealthiest urban communities in Christendom. Demi, Danilo (1997, P. 232).

Ottoman Famagusta, 1571–1878: Changes in social and social life majorly affected physical and the engineering environment. With a specific end goal to conform to the financial and social customs of the new tenants, a few changes were made to existing structures. Just the primary church building was transformed into a mosque (Lala

Mustafa Pasha Mosque), and the bazaar and commercial center were created. In the mean time, a religious school, showers and wellsprings were worked to satisfy essential every day needs. With the importation of deadlock roads from Ottoman culture, the current natural town structure was improved and a public soul started to state itself. The couple of two-story houses possessed by the predetermined number of well off individuals adjusted agreeably with the most basic one-story houses, Demi, Danilo (1997, P. 284).

The determination of these grade schools is likewise in view of the huge population of the children who are being taught here. As the principal point of the study is to uncover the discernment and experience of open air spaces by children in order to understand, identify the importance of the architectural landmark for child wayfinding; the noteworthy focus, as a contextual investigation zone, displays a solid character and a durable composition with it's very much characterized and all around utilized outside spaces (Stratis & Socrates. 2007, p. 79).

British rule, 1878–1960: In this period, the town experienced a change, mirroring the then current pioneer hones. The impact of British design was especially obvious in the structure, the subtle elements and the materials utilized. The British, who put stock in using so as to draw near to groups under their guideline nearby materials and subtle elements, utilized the same practice in Famagusta. The Cyprus Government Railway, with the head workplaces situated in Famagusta, is said to have changed Famagusta from an old Turkish town with its own tendency into a British harbor city serving Imperialist plan, Jeffery& George (1905-06, p. 481-493, p. 483).

After Independence, 1960: Cyprus changed definitely once more in 1974, when a progression of sensational political changes, including a rebellion by the Greek Junta of the time and a military intrusion by Turkey prompted a fierce division of the island and the evacuating of its individuals as indicated by rather simulated ethnic lines. The manufactured environment of Cyprus bears confirmation to the open injuries of the nation—through outcast settlements, military support zones, and fringes that cut through the capital city and the whole island. Regardless of the possibility that stupendous design undertakings of later years, for example, Zaha Hadid's configuration for the focal Eleftheria Square in Nicosia, Hopkins Architects' proposition for a Cultural Center, and Jean Nouvel's undertaking for a college library— might seek to a confident future, the military checkpoints and different scars on the physical environment are a steady indication of an uncertain political clash that shapes today's Cyprus and its architecture. (Fereos, Stefanos, and Petros Phokaides, 2006, p. 19).

4.3.3 Location of schools

Because of the changing population in the north part of the walled City, the understudy profile of the schools in the district is additionally changed. Against this foundation; the exploration was led at Lefkoşa Atatürk Ilkokulu (Nicosia Atatürk Primary School), situated in the Walled city (Figure 29) and Necati taşkın Ilkokulu) Necati taşkın Primary School) (Figure 30) in social housing distant in new developed part of Nicosia.

Table 7: Nicosia school's location

Nicosia	
Traditional	**New Develop**
Ataturk primary school	**Necati taskin primary school**

Table 8: Famagusta school's location

Famagusta	
Traditional	**New Develop**
Gazi primary school	**Alasya primary school**

4.4 Sample schools

Research case studies selected after mentioning factors which has been carefully checked in two main big cities in Turkish Republic of Northern Cyprus. In each city one school has been selected from new development and old part of the city in order to make the comparison possible. In this section selected cases will be explained.

4.4.1 Gazi primary school

This school is located within the walled city of Famagusta (figure 4.2), which is a very old district, including old building, churches, mosques, and old plantation, which all have become the symbol of the cities antiquity. The school is located near the main square of the walled city and has an eastern view towards the sea; and from the south east it is facing towards the green border of North and South Cyprus.

Figure 4.2: Gazi primary school in Famagusta (Author, 2015)

Figure 4.3: walled city of Famagusta near Gazi primary school
Varosha Photo :(http://www.northcyprusuk.com/,2011,(2015.10.09)

Moreover, most of the students in this school are from the immigrant families and they are living in the same area of the city, near the school or near the seaside. At the beginning of the survey, third year students are asked to draw routes from their houses to school. Then fifth grade students are asked to draw sketches and they mostly mentioned historical places and buildings.

Figure 4.4: Gazi primary school in Famagusta third-class (Author, 2015)

Figure 4.5: Gazi primary school in Famagusta fifth -class (Author, 2015)

4.4.2 Ataturk Primary School

This primary school is located in Nicosia that is within the walled city and it is next to a cultural monument. The building is old and big and students there come from different parts of the city. A survey has been done in this school as how it was done in the previous case and results almost became very similar to the same case (Figure 4.4). There are students from different social classes in this school. Students are asked to draw sketches and also were being asked about their drawings (Figure 4.5).

Figure 4.6: Ataturk primary school in Nicosia (Author, 2015)

Figure 4.7: Ataturk primary school in Nicosia (Author, 2015)

Figure 4.8: walled city of Nicosia near Ataturk primary school (Author, 2015)

4.4.3 Alasya Primary School

This school is a newly built primary school in the contemporary area of Famagusta (

figure 4.6),(figure 4.7. This school is near to a boulevard and surrounded by some new

apartments. It also has close access to a hospital and a shopping center. The evaluation

has been done the way that happened about two previous schools (figure 4.9).

Figure 4.9: Alasya primary school in Famagus of located in the contemporary of the city (Author, 2015)

Figure 4.10: located in the contemporary of the city around the Alasya premiere school Famagusta (Author, 2015)

Figure 4.11: Alasya primary school in Famagusta third and fifth -class (Author,2015)

4.4.4 Necati Taşkın Primary School

This school is located in the contemporary area of Nicosia and it is surrounded by many shops. The survey has taken place as the procedure was explained before (Figure 4.12).

Figure 4.12: Necati taşkın premiere school in Nicosia of located in the contemporary of the city (Author, 2015)

Figure 4.13: located in the contemporary of the city around the Necati taşkın premiere school Nicosia(Author, 2015)

Figure 4.14: Necati taşkın primary school in Nicosia third and fifth -class (Author, 2015)

4.5 Interviews

It has been attempting to interview with absolutely 170 students (eighty-six female, eighty-four male) in a primary school in Famagusta, and Nicosia (lefkoşa) North Cyprus. The data regarding their descriptions and uses of the landmark on their home to school way is collected via multiple or open-ended choice drawing, Sketch and answer the questions, and Cabriolet for home to school through the interviews.

4.5.1 Analysis Result

Approximately (57%) stated that they are walking to school while only (43%) students stated that they are coming by car. It is also elucidated that how many percentages of the children are due to the landmark as a powerful factor in spatial knowledge base on their gender and age. (50%) of the students are walking alone and the others are walking either with their friends or siblings. Even though they're always using the same route, as they stayed through the informal interview, walking through the city plays a fundamental role in terms of children's environmental perception and interaction with it.

In this part, the Children being asked to draw a commute to school based on their descriptions. The landmarks that are perceived as remarkable places by them include historical buildings, old buildings, new buildings, shopping mall, mosque, houses, grocery store, school, public park and repair shop, crosswalks or drawing table, traffic light, fence, and etc.

Figure 4.15: The Children draw a commute to school (third class)
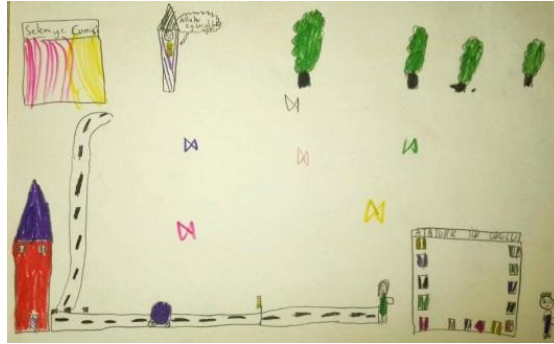
Figure 4.16: The Children draw a commute to school (five class)

These specified landmarks indicate that children are generally familiar only in the close surroundings of their home and school environment. Therefore, they perceive the buildings and/or open spaces, located on their homeschool route, as landmarks associating with the institutional uses. Historical buildings, such as courthouses, and mosque create remarkable images for children with different architectural characteristics; however houses and the grocery store are significant places for children based on their daily activities. In relation to the socio-economical structure dominating the city and lack of sufficient public transportation, the historical center is occupied by small-scale manufacture such as car repair shops that find a place in children's imagery. As it's presented in table(4.5.2) and table (4.5.3), the new constructed building is the highly identified for female (67.5%) and the historic building is the highly identified for males (82.4%), the common answer for both formal (4.1 %) and male (2.4 %) students when they are asked about the important places on their route from home to school. The second most frequent answer is a grocery store for female (43.8%) and for male (56.2%)   and old tree for female (56.5%) and for male (43.5%) which is also the commonplace that children stop by on their home – school route.

The result of the process gathered in different tables which concluded from the students scetches and questionnaire answers in different steps. At the beginning tables [1]are designed to show the general information from the students' opinion as a general understanding of the research duration. For the second step division has been done according to the new development and traditional districts and analysis has been done accordingly. For the last step all data grouped related to the details which makes all comparisons possible, which is the separation according to the city and district together; as an example the Famagusta city traditional purse is created one group separated from the Nicosia traditional section.

Table 9: New Constructed buildings cross tabulation

| | | | Constructed Buildings | | |
			No	Yes	Total
Gender	Female	Count	33	54	87
		% within New Buildings	36.7%	67.5%	51.2%
	Male	Count	57	26	83
		% within New Buildings	63.3%	32.5%	48.8%
Total		Count	92	80	170
		% within New Buildings	100.0%	100.0%	100.0%

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[1] The tables are start from left to right for a description and also start from up to down for a computational numbers. There are computational percent in the last row.

Table 10: Traditional and Historical buildings cross tabulation

			Traditional and Historical Buildings		
			No	Yes	Total
Gender	Female	Count	78	9	87
		% within Old. Buildings	65.5%	17.6%	51.2%
	Male	Count	41	42	83
		% within Old. Buildings	34.5%	82.4%	48.8%
Total		Count	119	51	170
		% within Old. Buildings	100.0%	100.0%	100.0%

Mosques, having a different architectural characteristic such as structural components of domes and minarets, as well as dominating scale in terms of size and height, compared to the surrounding traditional building types, is evaluated as a landmark by children. On the other hand, the frequent use of the mosque based on their families' religious practices is also a factor affecting their landmark identification. Although a grocery store doesn't have a distinguishable characteristic, compared to the structural effect of a mosque, it's a secondarily identified landmark in relation to its functional use. Together with the other environmental elements expressed by children, most frequent answers reveal that children's perception is mostly local and based on their daily activities.

Table 11: Old tree Crosstabulation as a landmark

			Tree		
			No	Yes	Total
Gender	Female	Count	48	39	87
		% within _tree	47.5%	56.5%	51.2%
	Male	Count	53	32	83
		% within tree	52.5%	43.5%	48.8%
Total		Count	101	71	172
		% within tree	100.0%	100.0%	100.0%

As seen in the table, the percentage of female students who have seen the tree as a landmark are 39 persons equivalent to 56.5% and 43.5% is equivalent to 32 percent of male students.

Table 12: Pharmacy Crosstabulation as a route knowledge

			Pharmacy		
			No	Yes	Total
Gender	Female	Count	67	20	87
		% within _Pharmacy	49.3%	58.8%	51.2%
	Male	Count	69	16	85
		% within Pharmacy	50.7%	41.2%	48.8%
Total		Count	136	34	172
		% within Pharmacy	100.0%	100.0%	100.0%

According to the top table, the percentage of female students who have seen the pharmacy as route knowledge are 20 persons equivalent to 58.8% and 41.2% are equivalent to 16 percent of male students.

Table 13: Hypermarket Crosstabulation as survey knowledge

| | | | Hypermarket | | Total |
			No	Yes	
Gender	Female	Count	55	32	87
		% within _hypermarket	47.8%	58.2%	51.2%
	Male	Count	60	23	83
		% within hypermarket	52.2%	41.8%	48.8%
Total		Count	115	55	170
		% within hypermarket	100.0%	100.0%	100.0%

We can see in the chart above the percentage of female students who have seen the pharmacy are 20 persons equivalent to 58.8% and 41.2% is equivalent to 14 percent of male students.

Table 14: Bus Stop Crosstabulation as route knowledge

| | | | Bus Stop | | Total |
			No	Yes	
Gender	Female	Count	77	10	87
		% within bus. Stop	53.1%	40.0%	51.2%
	Male	Count	68	15	83
		% within bus. Stop	46.9%	60.0%	48.8%
Total		Count	145	25	170
		% within bus. Stop	100.0%	100.0%	100.0%

The table above shows the percentage of female students who have seen the pharmacy are 10 persons equivalent to 40.0% and 60.0% is equivalent to 15 percent of male students.

Table 15: Telephone booth Crosstabulation as a route knowledge

| | | | Telephone booth | | Total |
			No	Yes	
Gen der	Female	Count	82	5	87
		% within Telephone booth	54.3%	26.3%	51.2%
	Male	Count	69	14	83
		% within Telephone booth	45.7%	73.7%	48.8%
Total		Count	151	19	170
		% within Telephone booth	100.0%	100.0%	100.0%

As seen in the table, the percentage of female students who have seen the telephone booth as a landmark are 5 persons equivalent to 26.3% and 73.7% is equivalent to 19 percent of male students.

Table 16: Filling station Crosstabulation as a route knowledge

			Filling station		Total
			No	Yes	
Gender	Female	Count	76	11	87
		% within filling station	53.5%	39.3%	51.2%
	Male	Count	66	17	83
		% within filling station	46.5%	60.7%	48.8%
Total		Count	142	28	170
		% within filling station	100.0%	100.0%	100.0%

According to the top table, the percentage of female students who have seen the filling station as route knowledge are 11 persons equivalent to 39.3% and 60.7% is equivalent to 17 percent of male students.

We can see the table below, the percentage of female students who have seen the square as a landmark are 28 persons equivalent to 47.5% and 52.5% is equivalent to 31percent of male students.

Table 17: Square Crosstabulation as route knowledge

			Square		Total
			No	Yes	
Gender	Female	Count	59	28	87
		% within square	53.2%	47.5%	51.2%
	Male	Count	52	31	83
		% within square	46.8%	52.5%	48.8%
Total		Count	111	59	170
		% within square	100.0%	100.0%	100.0%

Table 18: Butcher Crosstabulation as a route knowledge

			Butcher		Total
			No	Yes	
Gender	Female	Count	78	9	87
		% within Butcher	51.7%	47.4%	51.2%
	Male	Count	73	10	83
		% within Butcher	48.3%	52.6%	48.8%
Total		Count	151	19	170
		% within Butcher	100.0%	100.0%	100.0%

The table above shows the percentage of female students who have seen the butcher as route knowledge are 9 persons equivalent to 47.4% and 52.6.0 % is equivalent to 10 percent of male students.

Table 19: Grocery Crosstabulation as a route knowledge

| | | | Grocery | | |
			No	Yes	Total
Gender	Female	Count	59	28	87
		% within grocery	55.7%	43.8%	51.2%
	Male	Count	47	36	83
		% within grocery	44.3%	56.2%	48.8%
Total		Count	106	64	172
		% within grocery	100.0%	100.0%	100.0%

According to the top table, the percentage of female students who have seen the grocery are 28 persons equivalent to 43.8% and 56.2% is equivalent to 36 percent of male students.

Table 20: Humans Crosstabulation as a survey knowledge

| | | | Humans | | |
			No	Yes	Total
Gender	Female	Count	67	20	87
		% within humans	47.9%	66.7%	51.2%
	Male	Count	73	10	83
		% within humans	52.1%	33.3%	48.8%
Total		Count	140	30	170
		% within humans	100.0%	100.0%	100.0%

As seen in the table, the percentage of female students who have seen humans are 20 persons equivalent to 66.7% and 33.3% is equivalent to 10 percent of male students.

Table 21: Villa Crosstabulation as route knowledge

| | | | Villa | | |
			No	Yes	Total
Gender	Female	Count	73	14	87
		% within Villa	59.3%	29.8%	51.2%
	Male	Count	50	33	83
		% within Villa	40.7%	70.2%	48.8%
Total		Count	123	47	170
		% within Villa	100.0%	100.0%	100.0%

We can see the table below, the percentage of female students who have seen the villa are 14 persons equivalent to 29.8% and 70.2% is equivalent to 33 percent of male students.

Table 22: school buildings Crosstabulation survey knowledge

| | | School buildings | | |
		No	Yes	Total
Female	Count	63	24	87
	% within School buildings	50.0%	54.5%	51.2%
Male	Count	63	20	83
	% within School buildings	50.0%	45.5%	48.8%
Total	Count	126	44	170
	% within School buildings	100.0%	100.0%	100.0%

As can be seen in 3 of the following table the percentage of female students who have seen the school building are 24 persons equivalent to 54.5% and who have seen shopping malls 25 persens equivalent to 55.6% and who have seen park are 31 persons equivalent to 53.4%. The results of male students are as below: school building 20 persens equivalent to 45.5% and shopping mall with 20 percent and 44.4% and the park 27persent with 46.6%.

Table 23: shopping mall Crosstabulation as a route knowledge

			Shopping mall		Total
			No	Yes	
Gender	Female	Count	62	25	87
		% within a shopping mall	49.6%	55.6%	51.2%
	Male	Count	63	20	83
		% within a shopping mall	50.4%	44.4%	48.8%
Total		Count	125	45	170
		% within a shopping mall	100.0%	100.0%	100.0%

According to the down table (Table 4.4.16), the percentage of female students who have seen the park are 31 persons equivalent to 53.4% and 46.6% is equivalent to 27 percent of male students. In this section have explained the male child's details are available in the park with a sketch and also female students to describe the park, have used the color and humans.

Table 24: park Crosstabulation as a survey knowledge

			Park		Total
			No	Yes	
Gender	Female	Count	56	31	87
		% within park	50.0%	53.4%	51.2%
	Male	Count	56	27	83
		% within park	50.0%	46.6%	48.8%
Total		Count	112	58	170
		% within park	100.0%	100.0%	100.0%

The table below above shows the percentage of female students who have seen the Crosswalks are 24 persons equivalent to 42.1% and 57.9% is equivalent to 33 percent of male students. Male students who commute on foot have used the crosswalks in their sketch more than females.

Table 25: Crosswalks or drawing as a landmark

			Crosswalks or drawing table		Total
			NO	Yes	
Gender	Female	Count	63	24	87
		%within Crosswalks or drawing table	55.8%	42.1%	51.2%
	Male	Count	50	33	83
		%within Crosswalks or drawing table	44.2%	57.9%	48.8%

Table 26: Statue as a landmark knowledge

			Statue		
			No	Yes	Total
Gender	Male	Count	71	16	87
		% within Statue	53.0%	44.4%	51.2%
	Female	Count	63	20	83
		% within Statue	47.0%	55.6%	48.8%
Total		Count	134	36	170
		% within Statue	100.0%	100.0%	100.0%

According to the top table, the percentage of female students who have seen the Statue as a landmark are 16 persons equivalent to 44.4% and 55.6% is equivalent to 20 percent of male students. The statue is one of the most important indicators landmark and it can consider in the category of landmark holistic review.

Table 27: Advertising as a survey knowledge

			Advertising		
			No	Yes	Total
Gender	Female	Count	74	13	87
		% within Advertising	50.3%	56.5%	51.2%
	Male	Count	73	10	83
		% within Advertising	49.7%	43.5%	48.8%
Total		Count	147	23	170
		% within Advertising	100.0%	100.0%	100.0%

We can see the table (25), the percentage of female students who have seen the Advertising are 13 persons equivalent to 56.5% and 43.5% is equivalent to 10 percent of male students.

Table 28: Flag table as a landmark

| | | | Flag | | |
			No	Yes	Total
Gender	Female	Count	81	6	87
		% within Flag	53.6%	31.6%	51.2%
	Male	Count	70	13	83
		% within Flag	46.4%	68.4%	48.8%
Total		Count	151	19	170
		% within Flag	100.0%	100.0%	100.0%

Table 29: Parking as a route knowledge

| | | | Parking | | |
			No	Yes	Total
Gender	Female	Count	73	14	87
		% within Parking	52.9%	43.8%	51.2%
	Male	Count	65	18	83
		% within Parking	47.1%	56.2%	48.8%
Total		Count	138	32	170
		% within Parking	100.0%	100.0%	100.0%

As can be seen in 2 of the up table the percentage of female students who have seen the flag which is considered the detailed view as a landmark are 6 persons equivalent to 31.6% and 68.4% is equivalent to 13 percent of male students. Also, we can see in another table the percentage of males who have seen the parking are 18 percent of male equivalent to 56.2% and 43.8% is equivalent to 14 percent of female students.

The table down shows the percentage of female students who have seen the mosques as a landmark are 22 persons equivalent to 52.4% and 47.6% is equivalent to 20 percent of male students. This result shows that the use of these items is more traditional as a landmark and This statistic is true more to male students.

Table 30: Mosques as a landmark

			Mosque		
			No	Yes	Total
Gender	Female	Count	65	22	87
		% within Mosque	50.8%	52.4%	51.2%
	Male	Count	63	20	83
		% within Mosque	49.2%	47.6%	48.8%
Total		Count	128	42	170
		% within Mosque	100.0%	100.0%	100.0%

According to the down 3 tables (Table29), (Table 30), (Table 31), the percentage of female students who have seen the Cemetery are 6 persons equivalent to 50.0% and 50.0% is equivalent to 6 percent of male students. On the other one (30) the percentage of female students who have seen the newsstand are 2 persons equivalent to 15.4% and 84.6% is equivalent to 11 percent of male students. In the table (31) female students seen that

Hospital are 12 persons equivalent to 54.5% and 45.5% is equivalent to 10 percent of

male students.

Table 31: Cemetery as a survey knowledge

			Cemetery		
			No	Yes	Total
Gender	Female	Count	80	6	86
		% within Cemetery	51.0%	50.0%	50.9%
	Male	Count	77	6	83
		% within Cemetery	49.0%	50.0%	49.1%
Total		Count	157	12	169
		% within Cemetery	100.0%	100.0%	100.0%

Table 32: Newsstand as a rout knowledge

			Newsstand		
			No	Yes	Total
Gender	Female	Count	84	2	86
		% within Newsstand	53.8%	15.4%	50.9%
	Male	Count	72	11	83
		% within Newsstand	46.2%	84.6%	49.1%

Table 33: Hospital as a survey knowledge

| | | | Hospital | | Total |
			No	Yes	
Gender	Female	Count	74	12	86
		% within Hospital	50.3%	54.5%	50.9%
	Male	Count	73	10	83
		% within Hospital	49.7%	45.5%	49.1%
Total		Count	147	22	169
		% within Hospital	100.0%	100.0%	100.0%

Table 34: Traffic lights as a landmark

| | | | Traffic light | | Total |
			No	Yes	
Gender	Female	Count	71	15	86
		% within Traffic light	53.0%	42.9%	50.9%
	Male	Count	63	20	83
		% within Traffic light	47.0%	57.1%	49.1%
Total		Count	134	35	169
		% within Traffic light	100.0%	100.0%	100.0%

Table 35: bank as a survey knowledge

			Bank		
			No	Yes	Total
Gender	Female	Count	72	14	86
		% within bank	51.8%	46.7%	50.9%
	Male	Count	67	16	83
		% within bank	48.2%	53.3%	49.1%
Total		Count	139	30	169
		% within bank	100.0%	100.0%	100.0%

Table 36: Cortes as a landmark

			Courtes		
			No	Yes	Total
Gender	Female	Count	77	9	86
		% within Cortes	52.0%	42.9%	50.9%
	Male	Count	71	12	83
		% within Cortes	48.0%	57.1%	49.1%
Total		Count	148	21	169
		% within Cortes	100.0%	100.0%	100.0%

As can be seen in 3 of the up table the percentage of female students who have seen the traffic lights are 15 persons equivalent to 42.9% and who have seen bank 14 persens equivalent to 57.1% and who have seen courts are 9 persons equivalent to 42.9%. The results of male students are as below: bank are 16 persens equivalent to 53.3% and the traffic lights with 57.1% percent and 44.4% and the courts for Mael 12 percent to 57.1%.

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Table 37: Traditional and Historical Public buildings as a survey knowledge

			Traditional and Historical Public buildings		
			NO	Yes	Total
Gender	Female	Count	77	10	87
		% within Old Public buildings	57.5%	27.8%	51.2%
	Male	Count	57	26	83
		% within Old Public buildings	42.5%	72.2%	48.8%
Total		Count	134	36	170
		% within Old Public buildings	100.0%	100.0%	100.0%

According to the top table, the percentage of female students who have seen the Traditional and Historical Public buildings as a survey knowledge are 10 persons equivalent to 27.8% and 72.2% are equivalent to 26 percent of male students.

Table 38: Ruin Church as a route knowledge

			Church		
			No	Yes	Total
Gender	Female	Count	80	7	87
		% within Church	54.1%	31.8%	51.2%
	Male	Count	68	15	83
		% within Church	45.9%	68.2%	48.8%
Total		Count	148	22	170
		% within Church	100.0%	100.0%	100.0%

Table 39: Restaurant as a landmark route knowledge

			Restaurant		Total
			No	Yes	
Gender	Female	Count	70	16	86
		% within Restaurant	51.1%	50.0%	50.9%
	Male	Count	67	16	83
		% within Restaurant	48.9%	50.0%	49.1%
Total		Count	137	32	169
		% within Restaurant	100.0%	100.0%	100.0%

As can be seen in 2 of the up table the percentage of female students who have seen the ruin Church are 7 persons equivalent to 31.8% and who have seen restaurant 16 persens equivalent to 50.0%.The results of male students are as below: Ruin Church are 15 persens equivalent to 68.2% and the restaurant with 50.0%.

Table 40: Barbershops route knowledge

			Barber shops		Total
			No	Yes	
Gender	Female	Count	77	9	86
		% within Barbershops	53.8%	34.6%	50.9%
	Male	Count	66	17	83
		% within Barbershops	46.2%	65.4%	49.1%
Total		Count	143	26	169
		% within Barbershops	100.0%	100.0%	100.0%

According to the top table, the percentage of female students who have seen the Barbershops as a landmark are 9 persons equivalent to 34.6% and 65.4% is equivalent to 17 percent of male students.

Table 41: ports as a survey knowledge

			Port		Total
			No	Yes	
Gender	Female	Count	83	3	86
		% within port	56.5%	13.6%	50.9%
	Male	Count	64	19	83
		% within port	43.5%	86.4%	49.1%
Total		Count	147	22	169
		% within port	100.0%	100.0%	100.0%

According to the top table, the percentage of female students who have seen the ports are 3 persons equivalent to 13.6% and 86.4% is equivalent to 19 percent of male students.

Table 42: Fence as a rout knowledge

			Fence		Total
			No	Yes	
Gender	Female	Count	82	4	86
		% within Fence	55.4%	19.0%	50.9%
	Male	Count	66	17	83
		% within Fence	44.6%	81.0%	49.1%
Total		Count	148	21	169
		% within Fence	100.0%	100.0%	100.0%

Table 43: Hotel as a survey knowledge

			Hotel		Total
			No	Yes	
Gender	Female	Count	79	7	86
		% within hotel	52.7%	36.8%	50.9%
	Male	Count	71	12	83
		% within hotel	47.3%	63.2%	49.1%
Total		Count	150	19	169
		% within hotel	100.0%	100.0%	100.0%

As can be seen in 2 of the following table the percentage of female students who have seen the Fence which is considered the detailed view are 4 persons equivalent to 19.0% and 81.0% is equivalent to 17 percent of male students. Also, we can see in another table the percentage of males who have seen the hotel are 12 percent of male equivalent to 63.2% and 36.8% is equivalent to 7 percent of female students.

Table 44: Bridge as a landmark

			Bridge		Total
			No	Yes	
Gender	Female	Count	83	2	85
		% within Bridge	54.2%	13.3%	50.6%
	Male	Count	70	13	83
		% within Bridge	45.8%	86.7%	49.4%
Total		Count	153	15	168
		% within Bridge	100.0%	100.0%	100.0%

The table up shows the percentage of female students who have seen the bridge as a landmark are 2 persons equivalent to 13.3% and 86.7% is equivalent to 13 percent of male students.

Table 45: Urban furniture as a rout knowledge

| | | | Urban.furniture | | |
			No	Yes	Total
Gender	Female	Count	62	24	86
		% within Urban furniture	53.0%	46.2%	50.9%
	Male	Count	55	28	83
		% within Urban furniture	47.0%	53.8%	49.1%
Total		Count	117	52	169
		% within Urban furniture	100.0%	100.0%	100.0%

We can see the (table 43), the percentage of female students who have seen the Urban furniture are 24 persons equivalent to 46.2% and 53.8% are equivalent to 28 percent of male students.

Table 46: Uses color

			Color		
			No	Yes	Total
Gender	Female	Count	64	22	86
		% within color	48.1%	61.1%	50.9%
	Male	Count	69	14	83
		% within color	51.9%	38.9%	49.1%
Total		Count	133	36	172
		% within color	100.0%	100.0%	100.0%

As seen in the table, the percentage of female students who have uses color are 22 persons equivalent to 61.1% and 49.1% are equivalent to 83 percent of male students.

4.6 Results and discussion

On the connection of the examination, the consequences of the investigations are talked about in two sections. The primary part exhibits the understanding of individual meetings, including drawings of understudies and visual question through maps and photos. The second part comprises of the assessment of how to discover the path by youngsters in this Age range with historic points.

4.6.1 Solitary interviews

In the first part carried out with one hundred and seventy students include (male: 83, female: 88), the route is collected through multiple choice questions and draw sketch. Through the interviews and analysis is visible 105 equivalent to 61.8% students stated that they are coming by car and 65 stated equivalent to 38.2% that they are walking to school. 43.6% of the students are walking with their parent or friends and 56.4% are

walking alone (Table 4.6.1). The question was raised whether the children change their route when coming to school or not? Most of them said they always use the specified path. Research shows that even if they make use of the usual way walking through in the town plays a basic role in the idiom of children's wayfinding and environmental perception. However, the students describe their environment more with built environmental elements and while few students preferred have used details of streets and human figures and also color in their drawings (Figure 4.16), (Figure 4.17).

Table 47: Transportation Crosstabulation with gender segregation

			Gender		Total
			Female	Male	
Transport ation	Riding	Count	54	51	105
		% within transportation	51.4%	48.6%	100.0%
		% within gender	62.1%	61.4%	61.8%
	Sidewalk	Count	33	32	65
		% within transportation	50.8%	49.2%	100.0%
		% within gender	37.9%	38.6%	38.2%
Total		Count	87	83	170
		% within transportation	51.2%	48.8%	100.0%

Additionally, the natural elements such as animals, flowers, trees, Forest, etc. it is visible with different modulation and composition in some of the drawings (Figure 4.16).Their use of these origins can be the conclusion of their perception of the component's environment together with the natural environment. This idea, maybe Is imaginary.

Figure 4.17: draw with students of Necati taşkın primary school in Nicosia third class
(Author, 2015)
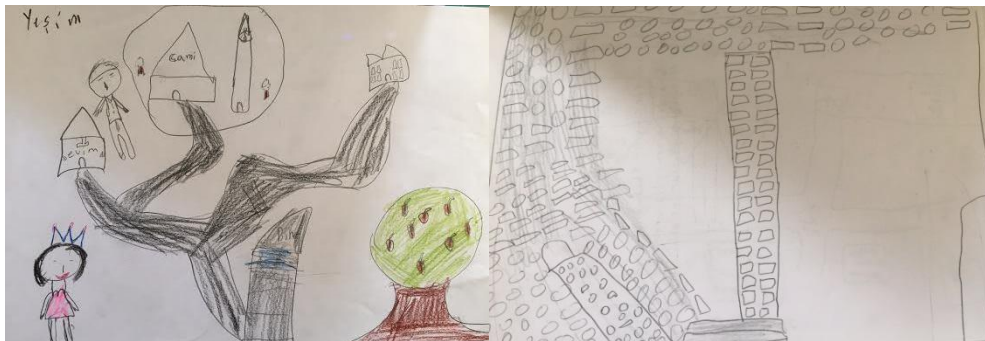
Figure 4.18: draw with students of Alasya primary school in Famagusta fifth class
(Author, 2015)

4.6.2 Data analysis

It should be noted at the outset, all tests were carried out on equal terms and timeframe
and specified. The data in the case study was choices in relation to the object-subject
interaction. Variables were gender, one the subjective side. The study is intended
transportation type, traditional direction, contemporary direction and also the study is
intended.

Table 48: Use view details

| | | | View.details | | |
			No	Yes	Total
Gender	Female	Count	60	27	87
		% within U_view.details	64.5%	35.1%	51.2%
	Male	Count	33	50	83
		% within U_view.details	35.5%	64.9%	48.8%
Total		Count	93	77	170
		% within U_view.details	100.0%	100.0%	100.0%

As it is seen from (Table 46) emphasize the knowledge of boys about limit environmental observations. According to the results of the data, the Table (46) indicates the percentage of male students who are able to see the details are 64.9% and the female student is 35.1% and this statistic indicates that the male students in this age range, there are seen more details than girls. In the drawings, including the so many details the meal students have used as a perception of the environment for wayfinding such as a traffic light, urban furniture, crosswalks, advertising, port, fence, bridge, flag (Graph1). On the other hand, the statistics for a female student is different. According to the table (Table 47), the percentage of the general perception is 63.5% for who females that comes from school riding and who comes sidewalk is 65.9%, while the statistics for boys that come white car is 36.5% and for another one is 34.1%. So conclude that the percentage of females are more general overview and this result

shows different environment of perception between male and female in this period of age.
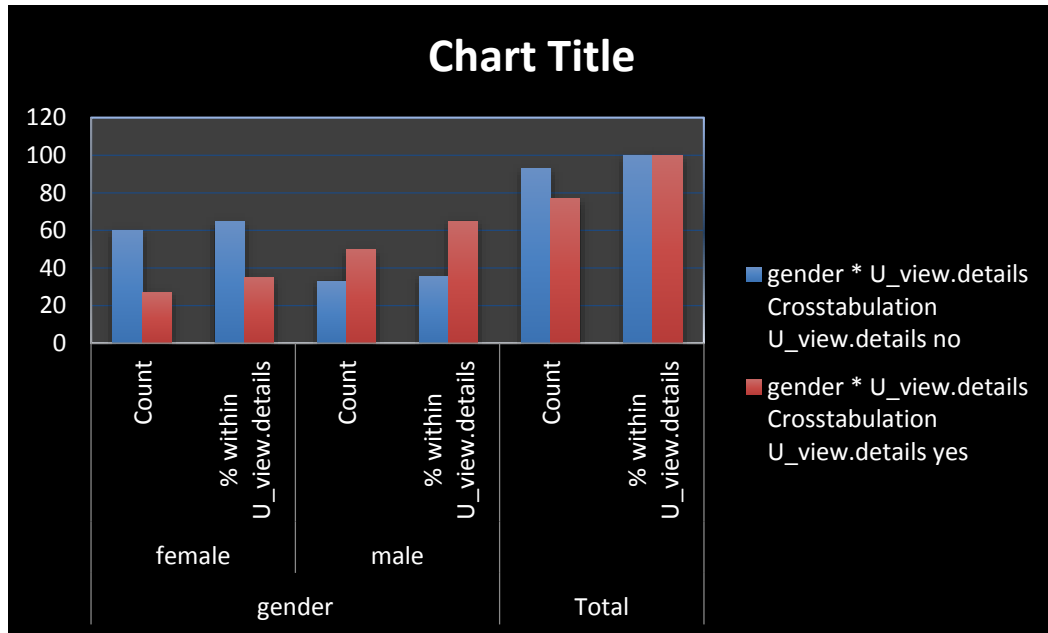
Figure 4.19: Use view details as a perception of the environment

Table 49: details viewed as a perception of the environment

			View details		Total
			No	Yes	
Gender	Female	Count	60	27	87
		% within U_view.details	64.5%	35.1%	51.2%
	Male	Count	33	50	83
		% within U_view.details	35.5%	64.9%	48.8%
Total		Count	93	77	170
		% within U_view.details	100.0%	100.0%	100.0%

Table 50: Holistic or general overview viewed perception of the environment

Transportation				Holistic or general overview		Total
				No	Yes	
Riding	Gender	Female	Count	7	47	54
			% within U_Holistic	22.6%	63.5%	51.4%
		Male	Count	24	27	51
			% within U_Holistic	77.4%	36.5%	48.6%
	Total		Count	31	74	105
			% within U_Holistic	100.0%	100.0%	100.0%
Sidewalk	Gender	Female	Count	6	27	33
			% within U_Holistic	25.0%	65.9%	50.8%
		Male	Count	18	14	32
			% within U_Holistic	75.0%	34.1%	49.2%
	Total		Count	24	41	65

Figure 4.20: Holistic or general overview viewed as a perception of the environment

As it is seen in the table below table(49)and (50) ,among male who walk to school on the contemporary parts in the both cities, according to statistics obtained, 33.3% pay attention to contemporary buildings and this statistics in the case of female students are 66.7% . This results in females that has transfer by riding are 69.0% percent and 31.0% of male student, there are seen contemporary buildings as a perception of the environment in wayfinding. In this table, results show that the male who are driven by car or school bus, pays more attention comparing to the other. On the contrary, females who travel by walk pay more attention contemporary building.

Table 51: Contemporary buildings viewed as a perception of the environment

Transportation				Holistic or general overview		Total
				No	Yes	
Rid ing	Gender	Female	Count	7	47	54
			% within U_Holistic	22.6%	63.5%	51.4%
		Male	Count	24	27	51
			% within U_Holistic	77.4%	36.5%	48.6%
	Total		Count	31	74	105
			% within U_Holistic	100.0%	100.0%	100.0%
Sid ewa lk	Gender	Female	Count	6	27	33
			% within U_Holistic	25.0%	65.9%	50.8%
		Male	Count	18	14	32
			% within U_Holistic	75.0%	34.1%	49.2%
	Total		Count	24	41	65
			% within U_Holistic	100.0%	100.0%	100.0%
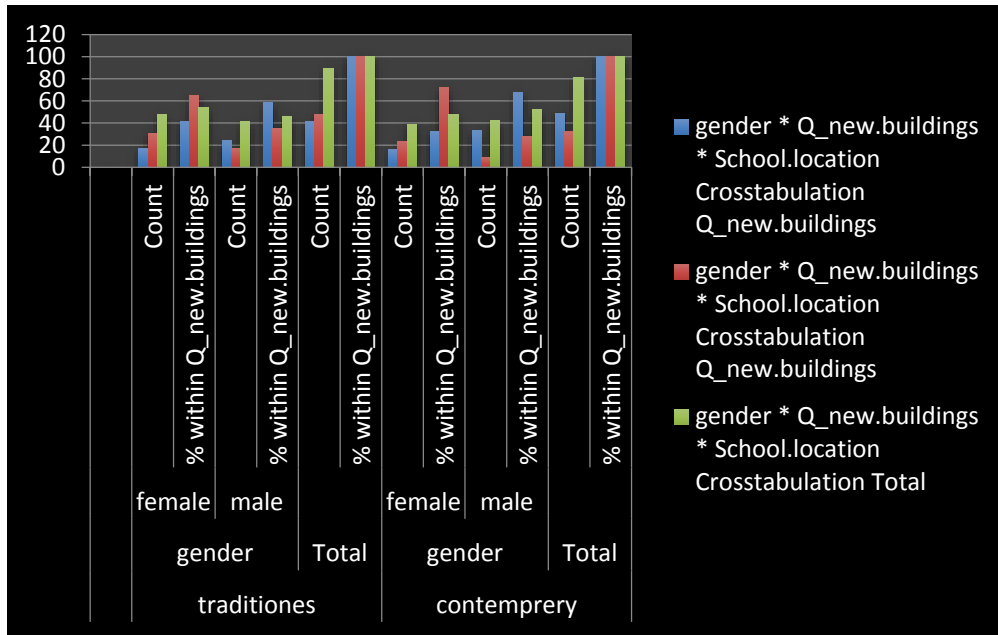
Figure 4.21: Holistic or general overview viewed as a perception of the environment

Table 52: Traditional and historical building, transportation Crosstabulation

Transportation				Contemporary buildings		Total
				No	Yes	
Riding	Gender	Female	Count	20	34	54
			% within new buildings	37.0%	66.7%	51.4%
		Male	Count	34	17	51
			% within new buildings	63.0%	33.3%	48.6%
	Total		Count	54	51	105
			% within new buildings	100.0%	100.0%	100.0%
Sidewalk	Gender	Female	Count	13	20	33
			% within new buildings	36.1%	69.0%	50.8%
		Male	Count	23	9	32
			% within new buildings	63.9%	31.0%	49.2%
	Total		Count	36	29	65
			% within new buildings	100.0%	100.0%	100.0%
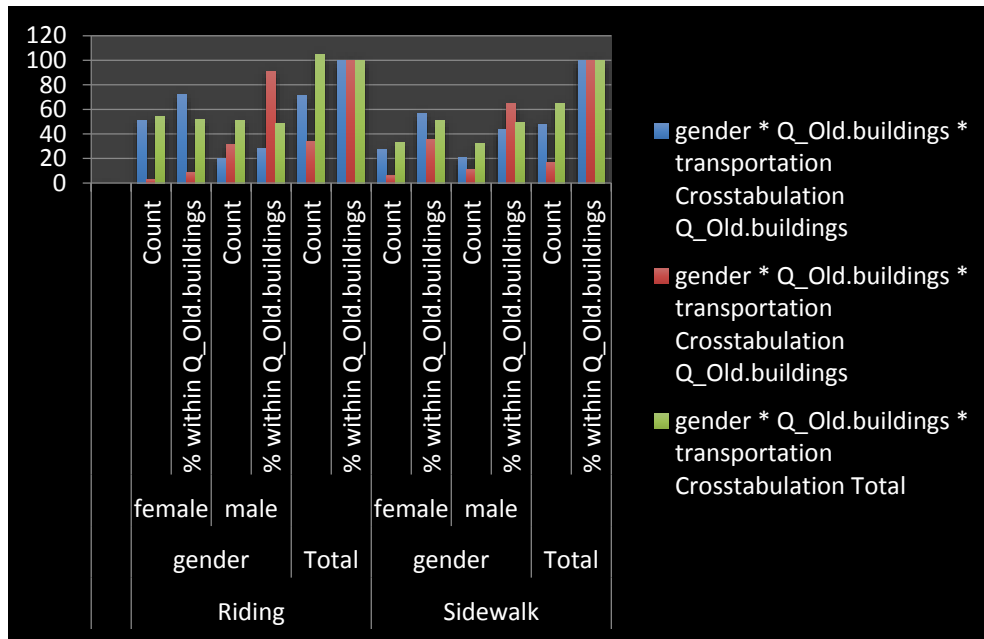
Figure 4.21: Traditional and historical building, transportation Crosstabulation

Final results of case study:

After doing the analysis and perceived children importance in order to find their way and considering the architectural elements, perception of environment, it became illustrated that there is a difference between boys and girls. In Famagusta and Nicosia cities, boys are mostly paying attention to buildings like villas or old traditional buildings while girls are still trying to catch the recent constructed buildings and general buildings with familiar function. Thus, there is a huge difference in boys and girls brain process to get the pints which is reliable for them to find their way, somehow it is possible to consider perceive the process of thinking between two genders is opposite.

In new development part of the city, there are many similarities between most of the constructed buildings which make it difficult for young members of the community to point out the remembrance point for guidance in their perception of the architecture of

the neighborhood, so boys tries to keep more detailed objects as a guidance and the girls still pay attention to the size of the building in order to get the direction. In both city old part and new developed area, the result of analysis done for the primary school children gave the same result which this research reaches the conclusion based on mentioned factor. The process of analysis is summarized in the table below in order to make the method more understandable.

Table 53: Famagusta Contemporary Buildings

School location				Contemporary buildings		Total
				No	Yes	
Traditions	Gender	Female	Count	4	20	24
			% within New Buildings	46.6%	70.6%	63.9%
		Male	Count	13	7	20
			% within New buildings	53.4%	29.4%	36.1%
	Total		Count	17	27	44
			% within New buildings	100.0%	100.0%	100.0%
Contemporary	Gender	Female	Count	8	13	21
			% within New buildings	39.7%	81.9%	38.1%
		Male	Count	17	4	21
			% within New buildings	60.3%	18.1%	61.9%
	Total		Count	25	17	42
			% within New buildings	100.0%	100.0%	100.0%

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Table 54: NICOSIA Contemporary Buildings

School Location				Contemporary buildings		Total
				No	Yes	
Traditions	Gender	Female	Count	8	16	24
			% within New buildings	35.5%	59.3%	53.9%
		Male	Count	12	9	21
			% within New buildings	64.5%	40.7%	46.1%
	Total		Count	20	25	45
			% within New buildings	100.0%	100.0%	100.0%
Contemporary	Gender	Female	Count	6	13	19
			% within New buildings	32.7%	71.9%	48.1%
		Male	Count	17	3	20
			% within New buildings	67.3%	28.1%	51.9%
	Total		Count	23	16	39
			% within New buildings	100.0%	100.0%	100.0%

Table 55: FAMAGUS TA Traditional Buildings

School location				Traditional and historical buildings		Total
				No	Yes	
Traditions	Gender	Female	Count	15	5	20
			% within Traditional and historical building buildings	74.1%	16.1%	53.9%
		Male	Count	4	16	20
			% within Traditional and historical building buildings	25.9%	83.9%	46.1%
	Total		Count	19	21	40
			% within Traditional and historical building buildings	100.0%	100.0%	100.0%
Contemporary	Gender	Female	Count	19	4	23
			% within Traditional and historical building buildings	57.4%	20.0%	48.1%
		Male	Count	14	6	22
			% within Traditional and historical building buildings	42.6%	80.0%	51.9%
	Total		Count	61	20	45
			% within Traditional and historical building buildings	100.0%	100.0%	100.0%

Table 56: NICOSIA Traditional Buildings

School Location				Contemporary buildings		
				No	Yes	Total
Traditions	Gender	Female	Count	8	16	24
			% within New buildings	35.5%	59.3%	53.9%
		Male	Count	12	9	21
			% within New buildings	64.5%	40.7%	46.1%
	Total		Count	20	25	45
			% within New buildings	100.0%	100.0%	100.0%
Contemporary	Gender	Female	Count	6	13	19
			% within New buildings	32.7%	71.9%	48.1%
		Male	Count	17	3	20
			% within New buildings	67.3%	28.1%	51.9%
	Total		Count	23	16	39
			% within New buildings	100.0%	100.0%	100.0%

Research Findings

The summary of all tables which leads the research for the conclusion is gathered at the single table in order to make the comparison between traditional and contemporary parts of the Famagusta and Lefkosa city more clearly. Also, this table shows the existing landmarks available in each part for the student which grouped after having a discussion and exported from children paintings.

Table 57: Famagusta and Nicosia marks

	Famagusta Tradutional	Nicosia Traditional	Famagusta Contemporary	Nicosia Contemporary
Ruin churche	■	■		
New Mosque			■	
Old Mosque	■	■		
Old Public Building	■	■		
Puclic Telephone booth	■			■
Buthcher	■		■	
Grocery		■		■
Human		■		■
villa	■		■	
School Buildings	■	■	■	
Park	■	■	■	■
Crosswalk	■	■		■
Statue		■		
Flag		■		■
Cemetery		■	■	
Bank Building	■	■		■
Sports Fields	■			■
Restaurant	■		■	
Port	■			
Fence	■	■		
Hotel	■			■
Bridge		■		■
Urban Furniture	■			
New Buildings			■	■
Traditional Building	■			
Old Tree	■			
Pharmacy			■	■
Hypermarket			■	■
Bus Stop			■	■
Filling Station			■	■
Square			■	■
Shopping Mall			■	■
Apartment			■	■
Advertising	■	■	■	■
Parking	■	■		
News Stand			■	■
Hospital			■	■
Trafic Light			■	■
Barber Shop	■	■	■	■

The importance of the landmarks in contemporary area is reduced in both cities. The reason is clear; the new way of living and city development affected negatively on the landmark, meaning in students' perception of the wayfinding in an urban pattern which is explained in the below table.

Table 58: Famagusta and Nicosia knowledge

	Landmark Knowledge	Route Knowledge	Survey Knowledge
Ruin churche		■	
New Mosque	■		
Old Mosque	■		
Old Public Building			■
Puclic Telephone booth		■	
Buthcher		■	
Grocery		■	
Human			■
villa		■	
School Buildings			■
Park			■
Crosswalk		■	
Statue	■		
Flag	■		
Cemetery			■
Bank Building			■
Sports Fields		■	
Restaurant		■	
Port			■
Fence		■	
Hotel			■
Bridge	■		
Urban Furniture		■	
New Buildings		■	
Traditional Building			■
Old Tree	■		
Pharmacy		■	
Hypermarket			■
Bus Stop		■	
Filling Station		■	
Square		■	
Shopping Mall			■
Apartment		■	
Advertising			■
Parking		■	
News Stand		■	
Hospital			■
Trafic Light	■		
Barber Shop		■	

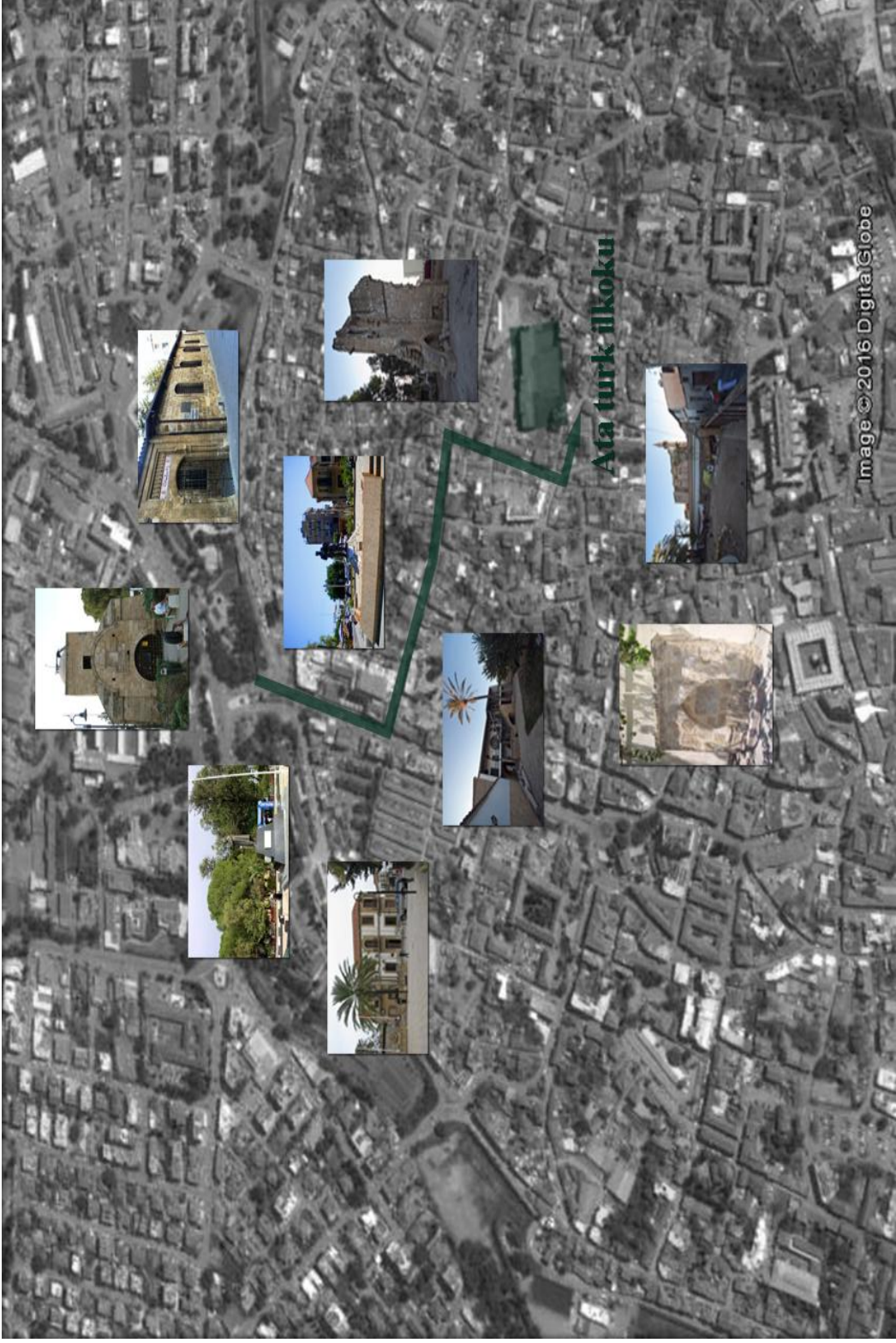Figure 4.22: Necati Taskin Primary school wayfinding

Figure 4.23: Ata Turk Primary school wayfinding

Figure 4.24: Gazi Primary school wayfinding

Figure 4.25: Alasya Primary school wayfinding

Chapter 5

CONCLUSION

5.1 Findings and Recommendations

Cognition of children and their brain maps, especially in the concrete operational stage, given some important clues related to topology and projective qualities of the environment. At this stage, variables such as gender and transportation and also the location of the school (traditional or contemporary) are significant issues, exposing important findings in understanding the environmental experience. The results which are obtained from These case studies show the accordance with theoretical expectations indicated in the concrete operational stage.

This also means that he projective and topological qualities of the environment are adequately distinguished from the sample group except for three-dimensional appreciation of the visual environment. The undertaken case study does not show significant results related to metric characteristics.

This observation also opposite of with Lynchs' (1977) thesis on the socio-spatial represents of adolescents based on gender differences. In it, he observed that mostly male show the environment as a map of streets and blocks, and the drawing was scheming and lacked seeing detail. Perhaps the difference is results based on the change in time and technology development as well as cultural and ethnic differences, which does not fit our story. In contrast, males made the pictorial representation of the

environment, and their drawings were full of logical details with the correct and regular sketch.

The results of the study emphasize that all urban buildings seem to affect the spatial perceptions and wayfinding of the children. According to the limitations intellectually and socially of children (limit of age and experience), they are aware of their surrounding environment and used for markings to identify the environment and wayfinding.

The male students show the significance of details linked to their close environment in their sketches and they also tend to show sensitivity in Choose Villa houses and buildings dating back or, in other words, traditional architecture as a mark. **On the other side**, the male students' cognitive experience in environmental or cityscape is much more compared to female students.

The female has more knowledge and experience related to the outer limits of the neighborhood, in other words, females are more general to the surrounding environment, including high-rise and new buildings, shopping centers and public buildings. The female students also uses her understanding in wayfinding and markings. This between The female students were using color as a landmark, while the male students did not use color as a landmark. **Also**, this researches found that found from this research the female student also showed more knowledge about way compared to male students. However the male students had an inclination more to illustrate area, specific land, and traditional architect landmarks in their sketches. The diversity between female and male students has been found considerable in imaginative qualities and perception space of the environment. This outcome can also

be expected one in accordance with gender roles in the north Cyprus society. Despite worldly concepts in modern society, yet the accountability is oriented to people. This acculturation procedure started at young ages do, children are motivated to discover the margin of the near environment at a young age.

5.2 Final Results

Finally, according to the results it seems visual elements affect the spatial perception of Children. Every child is unconscious, follow the signs to perceive space through to understand space through symptoms to understand space through landmark. The results of this thesis showed that, old buildings like churches, modern buildings like apartments, tree which is unique, urban furniture, social spaces and etc, are the mark for children. These landmarks for children between 8 to 12 years old, must be understood in terms of training and experience. Further investigation shows, there are differences between the child's perception with regard to gender differences, environmental location on separation traditional and contemporary based on wayfinding Landmarks.

This thesis may help to create more high-quality architectural buildings and architectural details to easier wayfinding for children in the future. This study had been done by considering the Cypriot culture and atmosphere, in order to have more concrete result for architects and urban designers for getting the acceptable result from the researchers point of view it is needed to analyze the founding in different situations and cultures. Also, this thesis prepares the base for psychologists and child care researchers' contribution; in order to find the best solution for the young members of the community to have the education began from the common area with considering the area characteristics (Traditional or new development) of the city.

Additionally, the thesis may help to figure out the importance of building quality and architectural details on children wayfinding. It can be noted that the children between 7-12 using the reference from their environment on daily trip which shows some differences from male and female. This thesis suggest that if the quality of buildings and spaces are increased, children will easily find their way by using those references on their daily route. However, the analysis shows that, the children find their way easily by using architectural landmarks in traditional environment where as contemprory /newly developed environments does not carries those qualification. This thesis will propose designers, psychologist, architect, urban designer and planner the importance of way finding while they are designing the environments. It will suggest that while they are designing the environments especially for the children;

- The quality of architecture in built environment is important

- Legibility of the routes should be qualified

- Some reference buildings or urban elements needed to be design in order to find our way.

- Image of the certain routes become important by analyzing the landmarks on the routes

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APPENDIX

Appendix A: Children's Sketch