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Visual Quality Assessment Methods in Landscape Architecture Studies

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1. Introduction

In our day, the continuous rise in population density and technological developments make urban life attractive. However, this situation has inevitable negative influences on human factors. The psychological pressure which is a result of these negative influences alienates human from natural life and makes human beings' admirations and expectations different.

The visual problems, which are the reflection of changes in urban landscape design, causes loss of prestige for many settlements and decreases the values of natural-cultural landscape (Coşkun and Kaplan, 2001).

While environmental issues are becoming more and more problematic and the size of green areas is decreasing day by day, the importance of natural resources are comprehended more seriously in today's conditions. Therefore, it can be accepted that the landscape is not just an economic issue but also an aesthetic one to evaluate and discuss about (Erdönmez and Kaptanoğlu, 2007). "Visual quality assessment" becomes an indispensable research topic when landscape is discussed as an aesthetic entity.

This point depends on visual perception and it can be called as "visual quality" in cities and "scenery beauty" in rural areas. Similar to the natural and cultural landscape areas, perceiving a space in recreational areas in terms of visibility influences the active or passive usage of these areas (Polat et al, 2012). Therefore, in order to develop the quality of recreational areas and increase users' satisfaction, specifying users' demographical characteristics is important in studies about "visual quality assessment" in landscape design.

When more than half of the last century is taken into account, landscape quality assessment can be seen as a contest between expert or design approach and public perceptual approach.

The previous studies mostly developed perception-centred approaches. These studies are usually used in sustainable environmental perception and landscape assessment research. Furthermore, the same studies are developed for public land administration practice. Both approaches put forward the fundamental idea which claims that biophysical characteristics are in interaction with the components of environment, human perception or experience. Landscape quality consists of the relationship between the characteristics of landscape and the influence of these characteristics on the users (Daniel, 2001).

Visual assessment studies focus on evaluating the visual characteristics, locational installation, and social life of a place or a route on a perceptual basis (including all sense organs, especially the eyes) within a functional relationship. These assessments become operative in urban settlements such as a broad place which includes a whole city or a division of a settlement or a route (boulevard, main road, street). The findings from the assessments also shape people's daily life, physical planning and design works (Kaplan and Hepcan, 2004).

This study presents an analysis of quality assessment and assessment approaches in landscape architecture, together with conducting a broad literature review and how the was used in practice. "Landscape quality assessment" studies claim that users' admirations and expectations have an influence on their awareness. Therefore, the studies put forward that landscape should not only be evaluated with design rules, and argue that the users' admirations should also be taken into account together with these rules.

2. Landscape architecture and visual quality

It is immensely important to explain what 'landscape' means in order to better analyse the work of 'visual quality assessment' within the profession discipline of landscape architecture. This is because visual quality works can be a research topic for different profession disciplines.

In this context,

- Landscape concept

Landscape is the view which situates in an observable frame and is composed of natural and cultural substances. At the same time, the notion refers to our capacity of how and how much we perceive the materials that surround us and how we setup a relationship with them. Landscapes are the most important aspects in setting up our locational identities. By the help of nature and history, landscapes provide the fundamental interaction amongst human (L.C.A., 2008).

Moreover, the lexical meaning of 'landscape' refers to a scene which comprises the natural beauties of a region or an area. In other words, it refers to the total land form or shape of a region. According to another definition, landscape can be described as a piece of area which is positioned in a certain view frame. It also refers to a composition of all natural and cultural environments within the aforementioned frame (Acar, 2003).

- Visual quality concept

Even though the literature shows that there are different definitions of visual quality concept in landscape design, it can be argued that the implied concept and the elements that is served for are similar.

Landscape visual quality is simply defined as 'the aesthetical perfection of landscape' (Polat and Önder, 2011). According to Daniel (2001), landscape visual quality is a common product of the observer's psychological (perceptual, cognitive, emotional) process which is in an interaction with apparent (visible) landscape characteristics. According to Kalin (2004), visual quality for an environment has a remarkable perceptual and objective structure as it includes many variables inside of it. Because of this characteristic, 'visual quality' is probably one of the hardest phenomena that can be analysed and measured in an environment.

In general, visual quality is a concept which shows the degrees of people's opinions and aesthetic admirations about living creatures, objects and the view around them.

- The concept of aesthetic

According to Porteous (1996), the concept of aesthetic originates from the Greek words "aisthanesthai" which means 'to perceive', and "aistheta" which means 'perceivable objects'. The lexical meaning of aesthetic is defined as the knowledge which was derived from senses (Çakıcı, 2007).

When its theoretical aspects are taken into account, aesthetics is one of the environmental design criteria which influences the protection and development of the 'landscape visual quality' for an ecological and sustainable landscaping (Kamicaityte and Janusatis, 2004). In this context, researchers' work would become easier by using the analyses on spatial applications. Photographic images and digital drawings are usually used as a method in order to evaluate the environmental quality. Most research projects showed that there are clear similarities between the actual land and the photographs which were employed in the surveys for the users. This means that objective results can be gathered even if the participants in the survey only make comments by looking at the images instead of going to the actual land. In addition to landscape designers and expert resource managers, different professionals such as ecologists, geographers, environmental experts and psychologists also use visual quality assessment in their research projects. Each profession discipline looks for a different method. 'Visual quality assessment' in landscape design are usually named as the perceptual interactivity of people (Lu et al., 2012).

When the approaches on aesthetic perception are considered, it can be seen that different methods were used concerning the studies on 'visual quality assessment'. Table 1 below categorised these approaches in brief.

While the expert approach is particularly powerful in environmental management applications, the approaches which are based on user perception are dominant in research

projects. Both approaches accept that landscape quality originates from the interaction between the landscape's biological and the observer's perceptual process. The difference between the two approaches is the mutual dominance of expert and user. In today's approach model, it is internalised that the first two approaches should be applied in parallel. This research, which prefers to evaluate the users' preferences and the experts' ideas together, is preferred more as it allows analysis and investigation in landscape planning and design (Erdönmez and Kaptanoğlu, 2007).

APPROACHES	APPLICATION AREAS
The evaluation approach which is based on experts' opinion	Environmental management applications
The evaluation approach which is based on the perception of users.	Research projects, academic works, etc.
The visual quality assessment approach which is based on the convergence of users' preferences and experts' opinions.	Environmental management applications, research projects, academic works, etc

Table 1. The approaches which are used in visual quality assessment studies

3. Visual quality assessment

In visual landscape assessments -in accordance with landscape planning, design and management objectives- there are several inventory analysis and assessments for different visual characteristics of landscape (Palmer and Hoffmann, 2000). Systematic visual landscape quality assessment developed and manifested in the second half of the 20th century. It started to be an actor in environmental management and policies, and became a scientific research area with its important literature (Özhancı and Yılmaz, 2011).

In this sense, the fundamental of today's 'visual quality assessment' studies originates from Kevin Lynch who published the book "The Image of the City" in 1960. The factors concerning the production of 'urban images', listed in Lynch's book (1960), light the way for many studies in the field.

Urban landscape is an important concept which mobilises people's joy and emotions, keeps them away from their daily life's stress, and psychologically refreshes them. For this purpose, renovating a city and its environment by a systematic way is only possible by using 'visual quality assessment' studies (Lynch, 1960). In this context, Nasar (1998) emphasised that the users' preferences can be measured in order to designate the likability degree of the elements that people like or not in different sectors of their cities (Chon, 2004).

In order to understand the importance of environment, investigating how people react to different characteristics of the environment is required. Therefore, experts want to know

whether the salient criteria, which were evaluated by the users, are statistically meaningful or not.

Visual quality studies directly address the users and they have an impact on the users. Therefore, it is important that planners and designers take into account the public opinion before a decision-making process in order to conduct the research in an objective way. According to the current literature, collaborating with the users and providing a good communication with them by employing photomontage and simulation techniques on the users have a positive impact on decision-making process in environmental design (Mahdjoubi and Wiltshire, 2001). It is observed that the visual techniques (photomontage, simulation, etc) that are used in research projects encourage the users' participation in the decision making process. This kind of comparison work lets the participants imagine their living space beforehand which is beneficial for us to perceive the participants' impressions. These impressions gathered from the participants are interpreted together with the experts' views. Accordingly, this provides a more objective evaluation in scientific research about visual quality (Chon, 2004).

The previous research also shows that the planning and design decisions which were supported by simulation and photomontage methods, carried out by the users, are more reliable and practical knowledge (Kaplan and Kaplan, 1989; Nasar, 1988; Nasar 1998; Purcell, 1986; Zube 1980). While Chon (2004) argues that the research related to environmental preference is usually presented with one criterion to the users, Moore (1989) claims that the preference of more than one user supports an interactive view. As a result of the interactivity of users' perception and aesthetics, 'environment' occurs.

Likability represents a psychological construction which includes subjective assessments about environment (Nasar, 1998). Likability includes two types of variables. They are:

- Physical environment,
- User's reaction

According to Lothian (2012), evaluation and mapping works in Australia was conducted by 'National Trust'. In their work, soil-geology, bio-diversity - geomorphology, rivers-lakes and the characteristics which were emphasised by those were analysed. The aim of the analysis was to explore the quality of landscape. However, the biggest shortcoming of their work was the exclusion of the public in the research. Therefore, the studies were by and large unsuccessful.

The method which was used in their studies are summarised in Figure 1 below.

In order to carry out the landscape analysis work in an objective way, the studies should include observation, analysis and synthesis, and these should undergo the cognitive process of human brain. On the other hand -within the scope of assessing qualitative values- visual quality, including the liked and not liked, is an emotional process which consist of people's preferences. Therefore, in this context, the components are analysed and the preferences are evaluated. Lothian's work about 'visual landscape quality' (2012) underlines that the participation of the local users brought more objective results in the Figure 2 below.

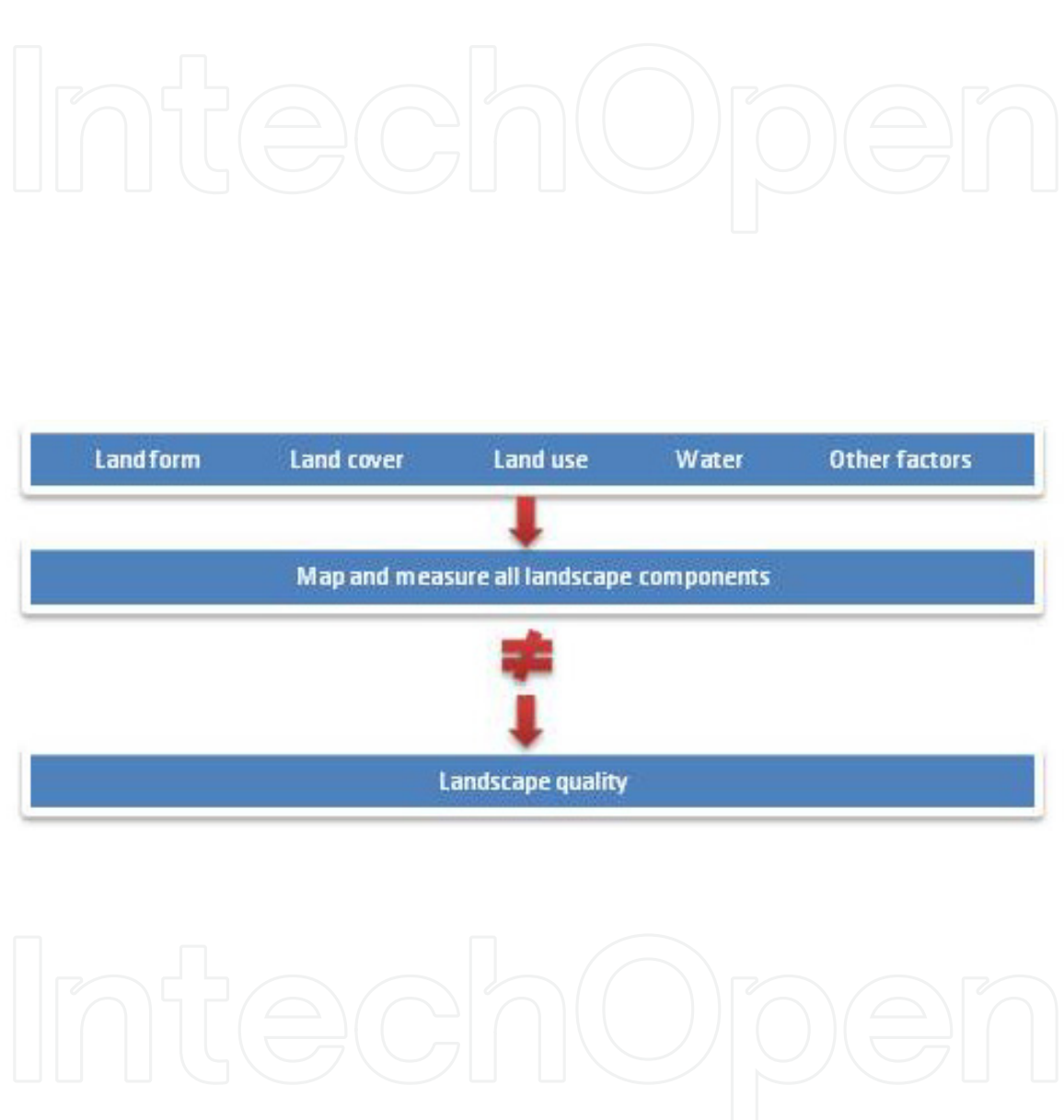


Figure 1. Traditional landscape quality assessment method – the wrong approach (Lothian, 2012).

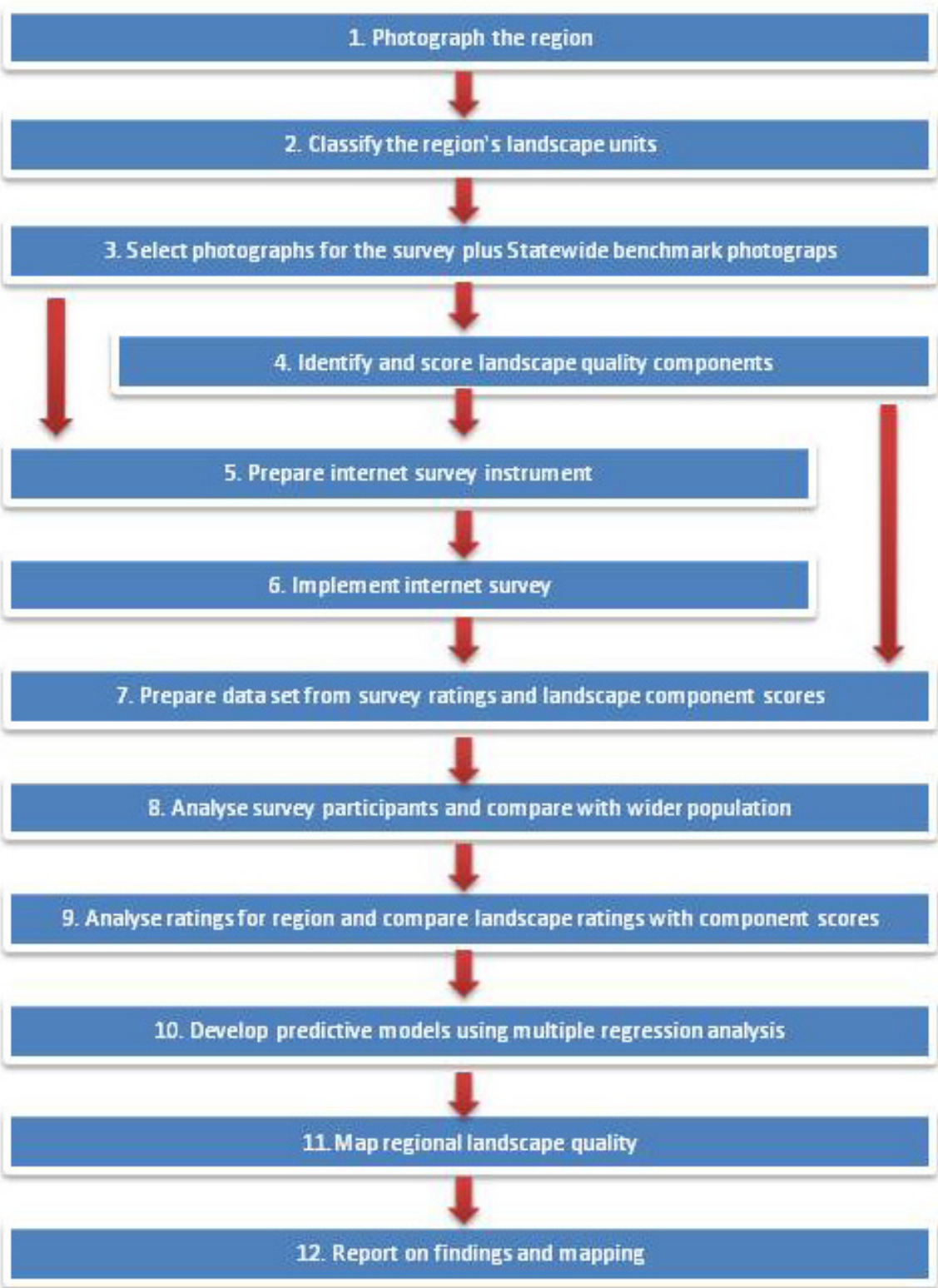


Figure 2. Landscape quality assessment method (Lothian, 2012).

Table 2., illustrates this by showing the influence of familiarity with the Flinders Ranges in South Australia. Being very familiar lifted the average rating for those persons by 12.5%, or 0.8 on the 1 – 10 scale. Even being slightly familiar enhanced ratings by 8% or 0.5.

Familiarity	Mean	%
Not familiar	6.07	100.0
Slightly familiar	6.57	108.3
Very familiar	6.83	112.5

Table 2. Influence of familiarity - Flinders Ranges (Lothian, 2012).

4. Some of visual quality assessment studies and the employed methods

Lynch developed a fundamental method which seeks to evaluate the urban form and improve the urban images (Coşkun and Kaplan, 2001). By the distinct model he established, Lynch claimed that any environment has the possibility to create a powerful quality and this was defined as 'imageability'. Lynch worked on this presumption by the quality assignation programme he conducted in the downtowns of Boston, New Jersey and Los Angeles. After these applications, the method proposed by Lynch includes two parallel study. In the first step, the analysed area is scanned and the observations are listed in a report. In parallel with this, a survey is conducted on a group of people which is large enough to represent the general characteristics of the society. The questionnaire includes questions related to important routes and locations. In addition to these two parallel studies, the strong and weak aspects of environment are analysed. In the second step, the important elements selected from another group will be placed, virtual travels will be performed, and the impression of experimental subjects by preparing the rough copies will be presented (Ak, 2010). By preparing a map and a report, the general quality of environment, its visual weakness and powerful aspects, characteristics and changing possibilities were determined.

In their research, Özhancı and Yılmaz (2011) focussed on 120 people and conducted a survey about a visual quality analysis of the area they chose. For this purpose, 48 pictures which can represent the area were selected and the participants were asked to evaluate the area in the pictures. Before the questionnaire, the participants were informed about the topic. Accordingly, parameters which are based on perception (naturalness, diversity, consistency, openness, mystery, perspective, confidence, order, the beauty of view) and recreation value parameters were used. In the second evaluation step, expert evaluations which focus on landscape characteristics were considered.

In Daniel's (2001) research called "Whither Scenic beauty? Visual landscape quality assessment in the 21st Century", reliability of individual expert evaluations was mentioned. The research found out that the consistency is not stable and different experts have different opinions on the same landscape. Studies in the field do not examine whether the abstract design parameters, which are based on expert evaluations, are related to landscape quality or perception-centred measurements.

In brief, it was not proved that the expert views were completely confidential in visual landscape quality assessments.

James' (2000) study called "Reliability of Rating Visible Landscape Qualities" looked at the reliability of evaluating the apprehended landscape characteristics by using perception. It was emphasised that the methods which were used in quality assessments should include the evaluation forms (questionnaires) which were approved by visual presentations. Moreover, the requirement to use the pictures while explaining the visual quality criteria was also mentioned.

Bishop and Rohrmann's (2003) study looks at the comparison of actual images and animation images. The study evaluated an actual and an animation view of a park at night and in day time together with the participants' perceptual reactions on these views. The conceptual framework of the study is shown in Figure.3.

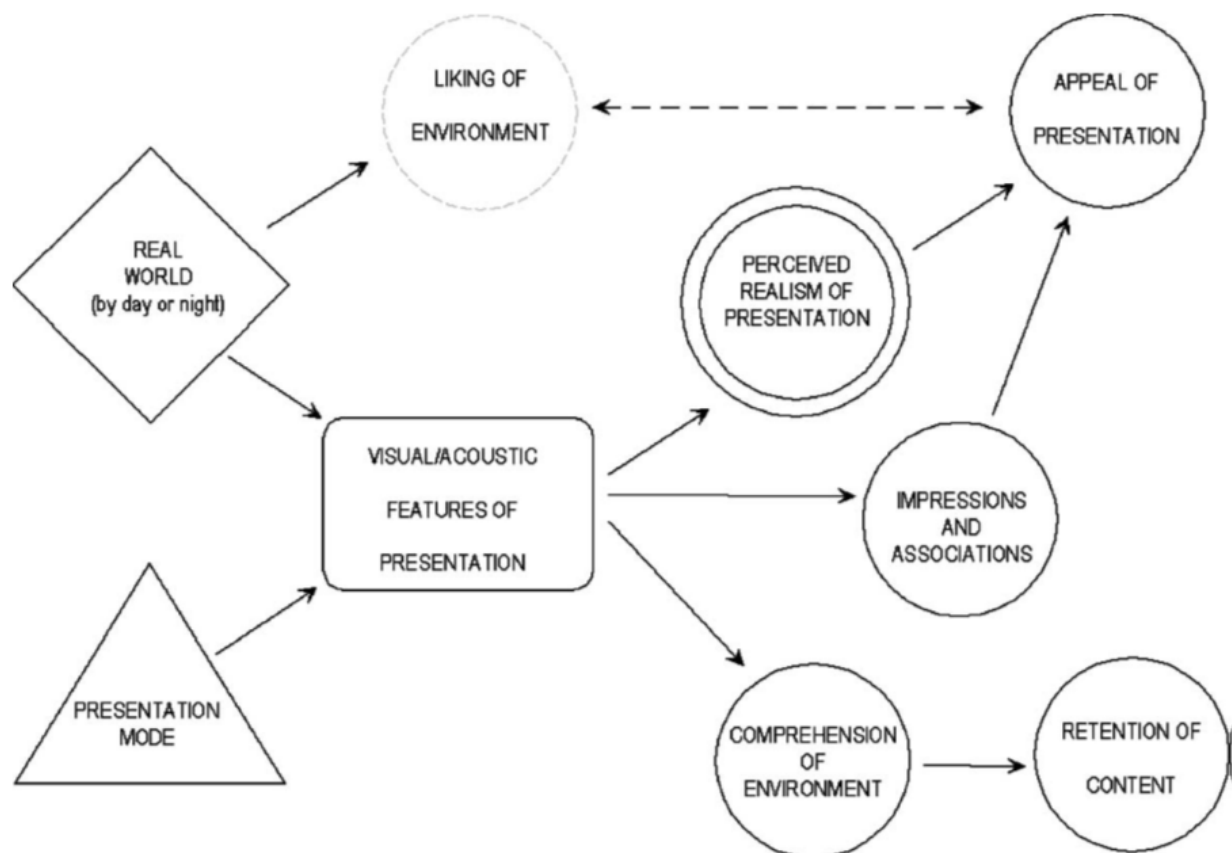


Figure 3. Conceptual framework of the study. Participant responses to the presentations are shown in circles. The presentations are a combination of the actual features of the environment and the chosen means of presentation (Bishop and Rohrmann, 2003).

In another study, Kaltenborn and Bjerke (2002) put forward the relationship between different landscape preferences and the living area. Local people were asked to evaluate the visual aspects of 24 different pictures which show different areas in the local people's area.

Kaplan and Hepcan's (2004) work focuses on visual quality assessments of the places where vehicles and pedestrians' way are used together. The study is based on the physical structure that shapes the location, and the visual analysis and assessment of senses which were gathered from social life. As the perceived senses differentiate during the day because

of climate, the fieldwork was conducted in İzmir, Turkey where this differentiation clearly appears in June in different times of the day. According to the method, the first section of the study looks at the typology of views which were perceived from important locations. The second section deals with the visual experiences and psychological senses which were gathered on the move and these were transformed into a set of statistical data and then evaluated. Then, the study presented some findings by ranking the values that were gathered in morning, noon and evening time. Finally, comparisons on these different rankings and a discussion were presented.

5. Conclusion

Studies on environmental quality assessment developed in the last 50 years. Researchers are active and influential in measuring the locational quality of environment, and preparing reliable visual quality maps about urban and rural environments. The quest for new methods in recent years in research projects shows how much important the visual quality studies are in perceiving the environment.

When 'visual quality assessment' studies are examined, there is no study which accepts the quality among the studies that were conducted only by referring to expert evaluations. Again, no study verified quality among the studies that were conducted only by the evaluations of public/users. In this context, the evaluations of experts and the perceptions and evaluations of public/users should be investigated in order to see how much they are in line with real aesthetic values.

Until recently, the evaluations were mainly about physical characteristics. In recent years, because of the aesthetic concerns on landscape, user-centred method selections were also added to these evaluations. In order to put forward the correct data regarding visual quality assessments, the physical, biological and social characteristics of environment should be considered together.

In particular, as long as expert/design approach continues to be unsuccessful in providing the correct and reliable criteria, the problem of deciding whether this approach is valid or not will be a continuous discussion.

According to most studies, if objective results are expected in 'visual quality assessment' studies, expert's view should not be the only source and the view of people who live in the area should also be taken into account. In this context, the analysis studies which are continuously renewed and corrected provide a basis for the plan which is going to shape the visual configuration of environment in the future.

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