

Assessment of the Visual Qualities of Educational Spaces Based on the Preferences of Users; Case Study: Ferdowsi University of Mashhad, International Campus*

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ABSTRACT

In recent decades, there has been considerable attention to the landscape and its relationship with the users' perception in the educational and academic environments. Given the impact of the environmental design on the education quality, the current study investigates the visual qualities of the educational spaces based on the users' recommendations in the Ferdowsi University of Mashhad, as the educational center in the eastern part of the country. Therefore, theoretical and practical methods were used to achieve the research purpose. In the theoretical aspect, using the qualitative-quantitative method and case study, the current research analyzed the findings. In this regard, the books and papers were also used. Then, the indicators and criteria of the visual quality based on the theorists' opinions were extracted in the theoretical part. In the practical part, the questionnaire and field study was applied. Out of 1775, 200 users were selected randomly among the students, professors, and the university staff in three zones of the university site. The Q-sort method was used to analyze the questionnaire and investigate the preferences of the user's quantitative (scores) and qualitatively (the reasons for scores). Then, the degree of conformity or non-conformity of the components affecting the visual qualities of space users with the views of theorists was measured. The research results show that the initial principal criteria in determining the visual qualities of the educational spaces based on the preference and opinion of the users in the studied site are as follows: proper vegetation and greenness of the space, using the proper color, proper space furniture, and their optimal location, using the natural elements and the use of the prominent and suitable element. Also, the factors such as the lack of using suitable and green vegetation, the lack of appropriate furniture and inappropriate location, unclean space, lack of discipline and calm in the space layout are the main components of the lack of desirability (lack of visual quality) based on the users of the university.

Keywords: Landscape Aesthetics, Visual Qualities, Preferences of the Users of Educational Spaces, Ferdowsi University of Mashhad.

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1. INTRODUCTION

Learning is the central part of the life of an individual. The learning environments will consist of elements that make sense together. The features and qualities of each one of these elements are influential in forming various behaviors (Bahamin, 2015, p.1). the quality of the physical elements in the educational environment as one of the main urban spaces, is also influential in the learning and reducing the daily stresses and sense of their satisfaction, and must establish the maximum relationship with the users and the space audiences. There have been few studies regarding evaluating the qualitative qualities of the educational spaces. In the conducted research in Iran as the one implemented in the University of Sistan and Baluchestan by Golchin et al., as well as the Zahedan Mellat Park by Khodarahmbazi et al., the degree of adaptation of influential components based on the preferences of users of space and the views of theorists have not been discussed. The current research aims to investigate the visual qualities of the educational spaces in the Ferdowsi University of Mashhad based on the opinions of the space users and their accordance with the ideas of theorists. Considering the solutions to increase the efficiency of the educational spaces (design based on the users' opinions), and improving the visual qualities, and reducing the negative effects resulted from the daily stresses are the most significant purposes of the current research. The research structure includes eight sections that are the introduction, background, theoretical foundation, research method, study area, data collection method, findings, and the discussion and conclusion, respectively. It is required that the designer and planners take into account and apply the evaluations and preferences of the people to the urban spaces, in general, and educational spaces, in particular, to design sustainable environments.

2. RESEARCH BACKGROUND

Some studies have been done in Iran and internationally regarding the assessment of the visual qualities of the landscape based on people's preferences.

There are some studies conducted on the evaluation of the users' preferences in the natural landscape. For instance, the paper entitled "people's preferences on forest development in the rural landscapes" was conducted by Nijnik and Mather (2008). Kearney et al. (2008) also studied the visual quality of the landscape on the precious national prospect". In a paper entitled ecological evaluation and visual preferences, Lafforetza et al. (2008) studied the alternative methods for renovating the wastelands of the industrial areas. Yao et al. (2011) also studied this subject in a paper entitled "evaluation of the visual qualities of the green spaces" (Bazi, Khamr, Kiani, Mirashkari, & Golchin, 2013, pp. 52-54).

On the other hand, in the studies conducted in Iran, Fathi, Dorini, and Narui (2007) studied the visual qualities of the educational spaces based on people's

preferences in a paper entitled vegetation landscape of the forest parks. In another paper, entitled Evaluation of the Visual Qualities of the Educational Spaces based On the users' preferences, Case study: University of Sistan and Baluchestan, Golchin, Narui, and Masnavi (2012) proposed solutions and strategies for improving the visual quality of the educational spaces of Sistan and Baluchestan University using participatory design and planning approach. However, the compatibility or non-compatibility of the users' preferences with the experts' opinions has not been studied. The paper entitled "Evaluation of Different Age groups' preferences of the visual landscapes o Mellat Park of Zahedan" conducted by Khorahmbazi et al. (2013), and the paper entitled Investigation of the Users' Preferences based on the evaluation of the visual quality (Case Study: Mellat Urban Forest Park of Zahren), written by Golchin, Narui, and Irani Behbahani (2013) can be mentioned as the studies in which, using the approach of the people preferences using Q-sort, the visual quality of this park was studied. In another study on the visual preferences of people in using the urban spaces, Saeidi and Nedaei (2015) in the paper entitled investigation of the effect of lighting and visual preferences of people in using the urban spaces (caste study: Valiasr Street between Parkvey Intersection and Tajrish Square, tried to explain preferences of people and the effect of lighting in using space with field studies and interview. Also, some studies have been done about the cultural heritage, street landscape, mountain and agricultural landscape, and so on. In the global experiences in the educational spaces, the studies of Kamelnia (2015) can be mentioned. For instance, McGill University, American University of Beirut, Hong Kong University, Yale University, British Columbia University, and Georgia University. Also, the paper entitled the preferences of people for designing abandoned spaces under urban bridges, conducted by Lak and Ramezani (2017), using the preferences of participants by interviewing and visual Q-Sort, addressed the influential factors for designing and organizing abandoned spaces such as abandoned spaces under the bridges.

It is noteworthy that the conducted studies addressed only the preferences of space users. However, the current study, first, studies the opinions of the theorists in the visual qualities. After studying the preferences of the users, the compatibility or non-computability of these cases was studied. Then, the design suggestions based on the users' preferences were recommended.

3. THEORETICAL FOUNDATIONS

In this section, the effects of the landscape in the educational centers and the influential factors on the visual qualities were addressed based on the global theorists' opinions. Then, by adopting these qualities with the considered site, the influential factors on improving the visual qualities of the educational spaces were extracted.

3.1. Landscape Effect on the Educational Centers

The majority of the learning theories pointed out the perceived effect of the open spaces on learning. Academic landscape designs are based on three main factors (Kamelnia, 2015, p. 82; Quoted from Dober, 2000, p. 3).

1. Physical environment, topography, weather, plants, construction materials, and so on.
2. The people for whom, space is built, traditions, social features, and so on.
3. The main purpose and function of the interaction between the two above factors.

3.2. Investigation of the Influential Components on the Visual Qualities Based on the Theorists' Opinions

In this section, the investigation of the influential components on visual qualities was addressed based on the theorists' opinions.

The mentioned variables based on Kaplan's theory are as follows:

- The ability to be away from the daily environments: being away from the daily environments and stresses of the working environment
- The ability of the environment attraction: the environment must attract people to nature.
- Creating a sense of vastness: the landscape provides a sense of vastness.
- Adaptation and compatibility: compatibility with the human needs (Shamgoli & Yeki Ta, 2010, p. 3; Quoted from Kaplan, 1995; pp. 169-182).

The variables mentioned by Yousefi, which are taken from the theories of Zangiabadi and Tabrizi (2010), Moradnejad et al. (2010), Khosravi and Ebrahimpour (2010), include the following:

- Urban furniture: providing the satisfaction of the citizens or the lack of it, the type of urban furniture affects the behavior and activity of the citizens.
- Urban edges: lead to the separation of different parts of the city and perception of the boundaries of the space.
- Urban element: the impact on the mental image of the citizens, and the dynamicity and static of the space and environmental qualities (Yousefi, Sadeghi, Abdollahi, & Charkhzarin, 2014, p. 10).

The variables mentioned by Wang & Chan (2012), Edward Dez (2007), and Khansari (2008) are as follows:

- Topography: as one of the influential factors on design.
- Plants: are among the determining factors in the academic landscape design and visual quality
- The surrounding environment and entrances: at the macro scale, the general feature of the university campus, and the micro-scale, the relationship between the buildings are considered (Kamelnia, 2015, p. 83; Quoted from Wang & Chen, 2012, p. 881).
- Creating green space: the design of green space to integrate the separated buildings (Kamelnia, 2015, p.

84; quoted from Edward, 2000, p. 91).

- Open and vast spaces: open spaces are influential by different spaces and size, and the functional scale.

- The proportion in the context: observing the connecting routes and visual axes that lead to the connection to the context (Kamelnia, 2015; p. 84 Quoted from Gharavi Khansari, 2008, p. 77).

The influential components on the visual qualities based on Bell's opinion (2008), as one of the main theorists in the visual qualities, are as follows:

- Lighting: daylight in the day, and moonlight at night
- Point, line, plane, and volume: visual expression of space-mass

- Number: the effect of repetition and accumulation of the elements on the spatial effects and the complexity of the design

- Situation: each one the horizontal, vertical, and diagonal, and oblique has meanings. The horizontal mode is shifted vertically from the static mode to the dynamic mode.

- Orientation: the position of elements in the landscape is perceived based on the orientation in the audience's mind.

- Size: the effect of dimensions (in comparison with the human body size)

- Shape: the straight or curved shape, the composite or regular and irregular.

- Distance: the even distance of the elements induces the sense of stillness and discipline and even the sense of being artificial.

- Texture: the soft and hard textures and in contradiction providing variety.

- Density: more density has more visual impact.

- Color: the main colors, complementary colors, and contributing colors in the nature affect the environment.

- Time: the changes and climate changes that occur over time in the objects.

- Visual force: it is created by the static objects and images by the establishment of a number of elements in a configuration in the landscape.

- Visual weight: Solid volumes with a certain shape, and sometimes a specific color may have more visual weight or heaviness (Bell, 2008, pp. 57-111). In the master plan of the Ferdowsi University of Mashhad approved in 2015, the following subjects were also mentioned: the optimal use of ecological potentials (such as the renovation of the watercourses as the ecological axes and the interaction areas of students), the preservation, and development of vegetation and animal species to improve the visual quality of the university (Kamelnia, 2015, p. 14).

By the comparison and adaptation of the study area in the Ferdowsi University of Mashhad presented in the map by the abovementioned factors, the factors mentioned in Table 1 can be considered as the influential factors in improving the visual quality of the educational environment which is the basis for providing photographs and implementing interviews, and eventually, codifying the visual quality classification model.

Table 1. Influential Components on the Visual Quality in the Studied Site

Row	Component	Row	Component	Row	Component	Row	Component
1	Away from the everyday environment and the attraction of the environment	5	Ecological Potential (the potential of the watercourse in the university)	9	The Number of Elements	13	Texture
2	Proper furniture	6	Static and Dynamic Spaces	10	Position and Orientation of the Elements	14	Color
3	Soft and hard edges	7	The Proportion of the Space and Furniture to the Context	11	Size and Form	15	Density
4	Ecological potential	8	Points, Lines, Surfaces	12	Distance	16	Light

4. RESEARCH METHOD

The current research has two practical and theoretical aspects. In the theoretical aspect, the qualitative-quantitative and case study approaches were applied to describe and analyze the findings. The resources such as papers and books were also utilized to extract the opinions of the experts on the effective components in the visual quality. In the practical section, the field study and questionnaire were used. The features such as the similarity in land use, the surrounding spaces, vegetation, and spatial distinctions were the criteria for determining the zones. Therefore, the studied site was divided into three main zones. The influential components on the visual quality extracted from the opinions of the theorists were used to provide the photographs. Some photos were taken from the various educational spaces of the Ferdowsi University of Mashhad (more than 100 photos). Most of the taken photos from the studied site were in August 2017, and all the photos were provided based on the one-point perspective. After removing some of the photos (the low quality or similar photos), 36 photos were finally selected for the 12 components from Table 1 (3 photos

per component). According to the statistical population in three zones, 200 users were randomly selected among the students, professors, and staff. The users were asked to classify the photos based on the range of very ugly, ugly, average, beautiful, and very beautiful (from the range of -2 very ugly to +2 very beautiful) and mention the reasons and criteria for selecting each photo. The preferences of the users were evaluated using the Q-sort method of visual quality.

This method was first used by Stephenson in psychology (Stephenson, 1965). In 1974, this method was used through the photo to evaluate the visual values. By applying this method, the various phenomena can be studied, acquire the information from the authorities and elites of the society, and recognize their opinion, and discover the vague and hidden information beyond this obvious information (Moradi, 2011, pp. 97-98). After extracting and analyzing the data, this study has dealt with the degree of conformity of users 'preferences and theorists' opinions. This issue has not been considered in other studies. Finally, design solutions with the focus on the preferences of users of the environment, according to the selected photos, are presented (Fig. 1).

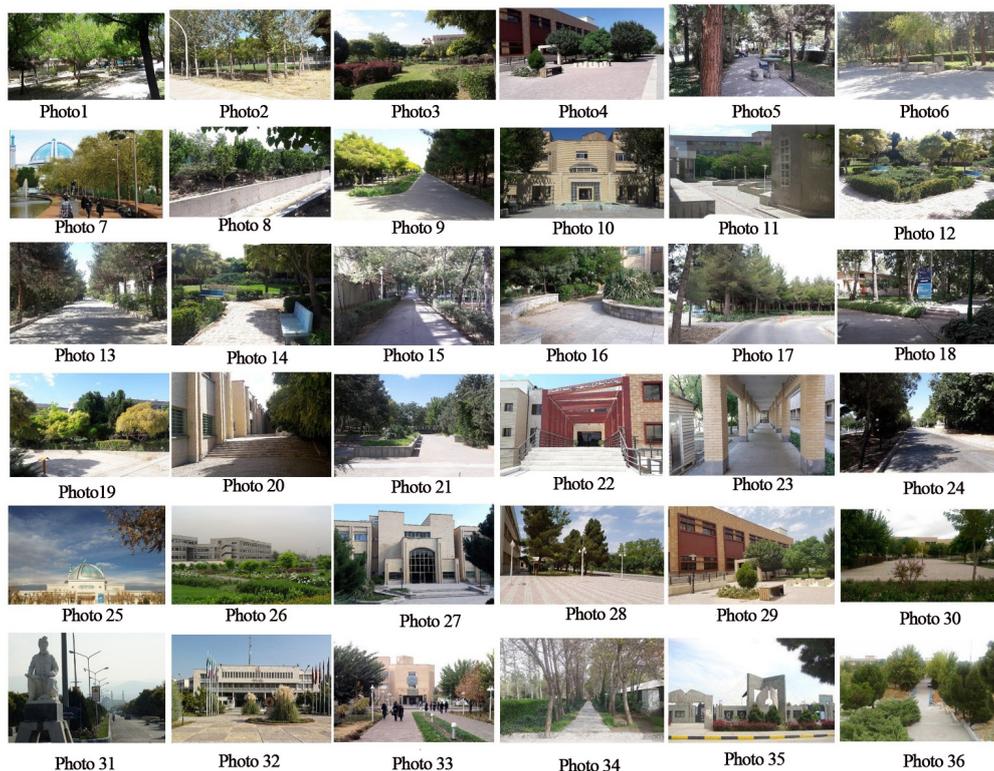


Fig. 1. Selected Photos from the Campus of Ferdowsi University of Mashhad for Visual Evaluation of the Landscape

5. STUDY AREA

The study area is located in the Rezasahar neighborhood, Zone 1, District 9, southwest of Mashhad. A large area of District 9 is educational land use, and a large part of it belongs to Ferdowsi University of Mashhad. The study areas at Ferdowsi University are also the following:

- Zone 1: The area is adjacent to the Faculty of Veterinary Medicine, where most of the users of this study area are professors, students, and staff of Ferdowsi University and the Faculty of Veterinary Medicine. Occasionally, employees of the university's water complex and professors (due to the presence of professors' restaurant and parking in this area) are also considered as users. This zone has a wide-open space. Green space in this area is mostly newly built, young and non-original

- Zone 2: The area is adjacent to the Faculty of Architecture, and Urban Planning (the newest faculty at Ferdowsi University, built in 2005) is towards the library. The green space in this area is mostly newly built, young, and not designed. Most of the users of this study area are professors, students, and employees of the Faculty of Architecture and Urban Planning. This area is adjacent to the existing watercourse in Ferdowsi University, which can become an interactive and lively axis if the sidewalk is defined.

- Zone 3: The area is adjacent to the central library, the space between the Faculty of Architecture and Urban Planning, the library, and the space in front of the library. In the current state, the extension of zone No. 3 leads to the tombs of the martyrs and the mosque of her highness Zahra (PBUH). It also leads to the Pardisan Ecological Park, which has been proposed in the master plan. Users of this study area include a wider range of visitors to the library and mosque. Due to its proximity to the existing watercourse in the university, it is possible to use it to improve the visual quality in this area.

In the next step, the data obtained from 200 questionnaires for 36 photos were inputted into Excel software version 2013. In Excel software, each photo was investigated, evaluated, and valued separately (Very beautiful = +2, Beautiful = +1, Average = 0, ugly = -1, very ugly = -2). The results obtained from the above study were presented in Table 2 separately. The following formula was used to calculate and conclude the scores of each photo (Equation 1).

$$N = \sum_{i=1}^5 (n_i) (3 - i)$$

Where,

N= Total score of each photo

n_1 = The number of people selecting the photo with the very beautiful quality

n_2 = The number of people selecting the photo with the beautiful quality

n_3 = The number of people selecting the photo with the average quality

n_4 = The number of people selecting the photo with the ugly quality

n_5 = The number of people selecting the photo with the very ugly quality.

6. DATA COLLECTION METHOD

After the field study and interview with 200 users of the educational spaces in the Ferdowsi University, which include 68 males and 132 females, to calculate the given score by 200 participants, equation 1 was used. Eventually, by dividing the total score of each photo by the number of people who scored the photo (200), the average score of each photo was obtained. The obtained findings were presented in Table 2. Accordingly, it was indicated that the audiences and users of space gave the maximum score to photo number 26 and the minimum score to photo number 8, which was the watercourse in the current status. The reason for selecting photo number 26 as the photo with maximum score can be considered as a part of the most applied stated components from the space users, such as green space and suitable vegetation, the use of proper color, spatial diversity, and vegetation diversity, appropriate architecture and the order and discipline in the space, indicating the need for maintaining the mentioned factors as the influential factors in the visual quality of space in the future design. Also, the reason for selecting photo number 8 as the photo with the minimum score from the participant is the dirty space, being old, and the use of inappropriate materials in the space. Although the existence of natural factors and the optimal use of the watercourse was introduced as a strength and potential in the theoretical foundations, it has the lowest score in this part, which indicates that the problem in the current situation for the audience and users of the space is not very pleasant. Therefore, the necessary measures should be taken in this regard and the proper design of the space.

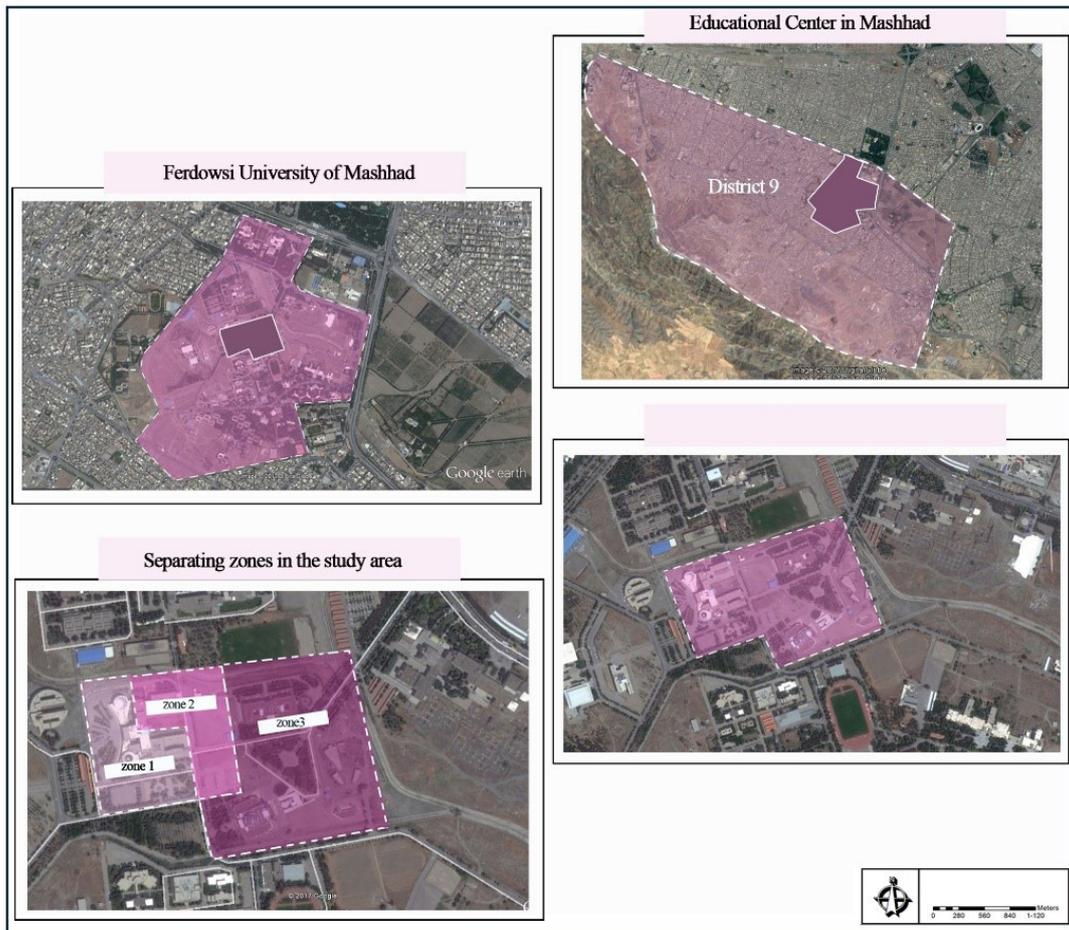


Fig. 2. Introduction of Study Area

Table 2. Score and Mean Score Earned by Each Photo on the Site Understudy

Photo Number	Image	Very Beautiful = N1	Beautiful = N2	Average = N3	Ugly = N4	Very Ugly = N5	N= Score of Each Photo	The Mean Score
1		33	81	76	7	3	134	0.67
2		3	39	86	61	11	-38	-0.19
3		103	83	13	0	1	287	1.435
4		66	86	38	8	2	206	1.03

Photo Number	Image	Very Beautiful = N1	Beautiful = N2	Average = N3	Ugly = N4	Very Ugly = N5	N= Score of Each Photo	The Mean Score
5		26	59	76	32	7	65	0.325
6		21	83	77	17	2	104	0.52
7		114	69	13	2	2	291	1.455
8		8	22	52	69	49	-129	-0.645
9		81	86	27	5	1	241	1.205
10		41	77	45	28	9	113	0.565
11		27	64	69	31	9	69	0.345
12		58	89	36	11	6	182	0.91
13		19	61	82	24	14	47	0.235
14		77	83	29	6	5	221	1.105

Photo Number	Image	Very Beautiful = N1	Beautiful = N2	Average = N3	Ugly = N4	Very Ugly = N5	N= Score of Each Photo	The Mean Score
15		13	44	69	55	19	-23	-0.115
16		19	60	69	34	18	28	0.14
17		23	71	70	25	11	70	0.35
18		46	70	59	19	6	131	0.655
19		77	88	26	7	2	231	1.155
20		21	67	73	27	12	58	0.29
21		32	82	68	15	3	125	0.625
22		60	80	37	12	11	166	0.83
23		52	89	40	15	4	170	0.85
24		10	60	95	25	10	35	0.175

Photo Number	Image	Very Beautiful = N1	Beautiful = N2	Average = N3	Ugly = N4	Very Ugly = N5	N= Score of Each Photo	The Mean Score
25		67	60	41	13	19	143	0.715
26		139	51	7	1	2	324	1.62
27		26	72	71	23	8	85	0.425
28		15	52	91	30	12	28	0.14
29		65	88	36	6	5	202	1.01
30		32	75	66	21	6	106	0.53
31		87	68	29	7	9	217	281.085
32		67	69	49	10	5	183	0.915
33		27	75	74	18	6	99	0.495
34		73	77	36	11	3	206	1.03

Photo Number	Image	Very Beautiful = N1	Beautiful = N2	Average = N3	Ugly = N4	Very Ugly = N5	N= Score of Each Photo	The Mean Score
35		64	65	32	19	10	154	0.77
36		31	68	68	21	12	85	0.425

In addition to the stated analyses and studying the quantitative scores given to each photo, the reasons for the given scores to the photos were also studied qualitatively. Out of the total opinions, 20 key

criteria were determined as the visual satisfaction reasons, and 20 principal criteria as the reasons for the visual dissatisfaction were specified, presented in Table 3.

Table 3. Investigating the Key Criteria of the Space Desirability and Undesirability Based on the Users' Opinion

Row	Desirability Criteria	Percentage of 200 Individuals	Row	Undesirability Criteria	Percentage of 200
1	Proper vegetation and green space	88.5	1	Lack of using proper vegetation	58
2	Using proper color in the space (bright colors)	58	2	Lack of using proper furniture and their inappropriate location	44.5
3	Proper space furniture and their optimal location	53.5	3	Unclean space	28
4	Using natural elements like water	50	4	Lack of discipline and order in the space layout	27.5
5	The appropriate and prominent element	49.5	5	Being old and worn out	27.5
6	Spatial diversity and non-uniformity	43	6	Using inappropriate materials in space	25.5
7	Using associative elements of line, plane, and volume	41	7	Severe daylight and darkness at night	22.5
8	Diversity in vegetation and using different plants	39	8	Inappropriate color in space	21
9	The proper light and shadow in the day and proper lighting at night	37	9	Improper flooring in the environment	19.5
10	Proper architecture	35	10	Unusable or inaccessible spaces	18.5
11	Discipline and order in space	33.5	11	Emptiness of space	17.5
12	Proper and defining entrance	32	12	Space uniformity	17
13	Proper building façade	24	13	Inappropriate with the context and improper facade	15
14	Proper flooring and harmony with the context	21.5	14	Inappropriate form and architecture	13.5
15	Creativity and novelty/ environmental design	20.5	15	Artificial space	9.5
16	Harmony with context and background	20	16	Repetitive elements	8.5
17	Being clean and nostalgic	16.5	17	Watercourse as an undesirable element	7
18	Using proper materials	16	18	Inappropriate sidewalk/ undesirable height difference, soulless of space	5.6
19	Spatial height difference as a kind of diversity/distance from everyday environment and relief from everyday stress	15	19	Crowded space/ inappropriate street curb	6
20	Being modern and new	12.5	20	Improper space entrance	5.5

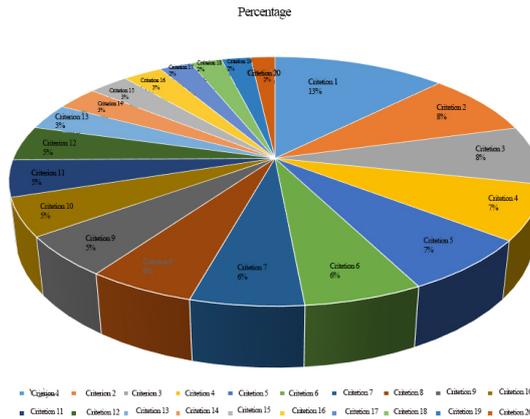


Fig. 3. Key Criteria of Space Desirability

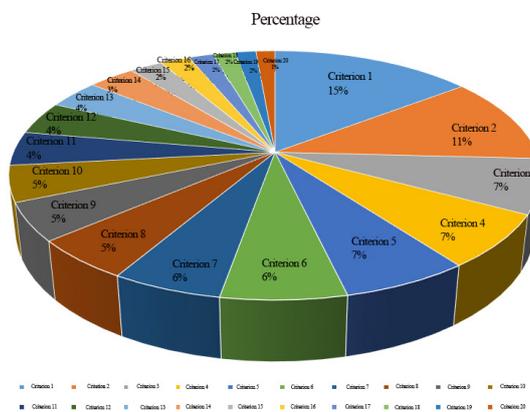


Fig. 4. 20 Key Criteria of the Space Undesirability

To study the adaptability of the influential factors on the visual qualities based on the experts' opinions and preferences of the space users, Table 4 was presented.

As can be seen, the stated components by the theorists are often mentioned by the users as well.

Table 4. Investigating the Adaptability of Components Affecting Visual Quality Based on Opinions of Theorists and Preferences of Space Users

Row	Influential Factors Based on the Opinions of Theorists	Users' Preferences	Row	Influential Factors Based on the Opinions of Theorists	Users' Preferences
1	Away from the everyday environment and the attraction of the environment	Compatible	9	The number of elements	Compatible
2	Proper furniture	Compatible	10	Position and orientation of the elements	Incompatible
3	Soft and hard edges	Compatible	11	Size and form	Compatible
4	Ecological potential (conservation and development of plant and animal species and use of plants)	Compatible	12	Distance	Slightly compatible
5	Ecological potential (watercourse at the university)	Compatible	13	Texture	Compatible
6	Static and dynamic spaces	Compatible	14	Color	Compatible
7	The proportion of the space and the furniture with the background	Compatible	15	Density	Compatible
8	Points, lines, planes	Compatible	16	Light	Compatible

7. RESEARCH FINDINGS

The research results indicate that the initial key criteria in determining the visual qualities of the educational spaces based on the preference and opinions of the space users in the studied site (Ferdowsi University of Mashhad), such as proper vegetation and greenness of the space (88.5%), using proper color in the space (58%), suitable furniture and their optimal location (53%), and using natural elements such as water (50%) have the maximum percentage. Also, the key criteria of the undesirability (poor visual qualities) based on the preference and opinions of the space users, including the lack of using proper vegetation and green space (58%), lack of using proper furniture and its optimal location (44.5%), unclean space (28%), and lack of order and discipline in the space layout of the elements (56.27%), have the highest percentages. In addition to the qualitative section, the quantitative section also has the highest score based on the above mention

regarding photo number 26 and the minimum score of photo number 8. Also, comparison and adaptation of the determining factors of the visual qualities based on the opinions of the theorists and the space users indicate their high compatibility. In this section, the proposed design is presented based on the influential key components on the visual qualities based on the preference and opinion of the space users.

In the section on designing green space, due to its considerable effect, it was tried to persevere the continuity of the green space. The significance of the green space was 88.5% among the participants that considered the green space as the factor for the space desirability.

One of the other factors mentioned by the users is the use of natural elements (fountain) in designing the educational environments that 50% of the participants mentioned. Also, the proper entrance affects the visual quality. Therefore, it was tried to focus on the natural elements in the entrance of the buildings.

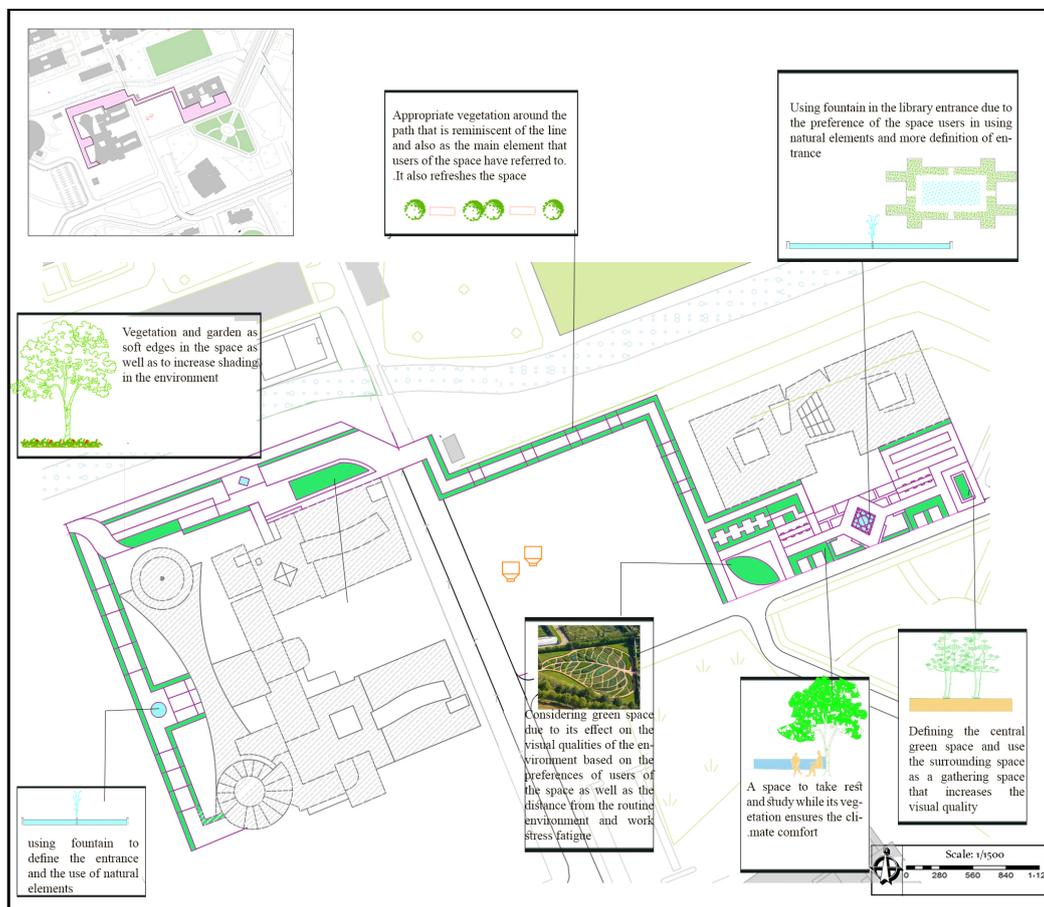


Fig. 5. Green Space and Natural Elements Design

Regarding color, 58% of the space users and participants in the questionnaires considered color as a significant factor in improving the visual quality of the environment. Also, the images with brighter and more proper colors scored higher. Therefore, in designing the study area, these points must be taken into account. Regarding furniture, the proper furniture or the lack of proper furniture was the main reason for the presence or absence of the people as well that are influential in the visual quality of the environment. In designing

the studied path, it was tried to use flexible and proper furniture. Also, the optimal establishment of the furniture is considerably significant that, in many cases, the furniture was adjacent to the greenspace to have climate comfort. Furthermore, by defining the functions such as temporary exhibition in adjacency to the library and the Faculty of Architecture and Urbanism, it was tried to use the furniture in proportion to space.

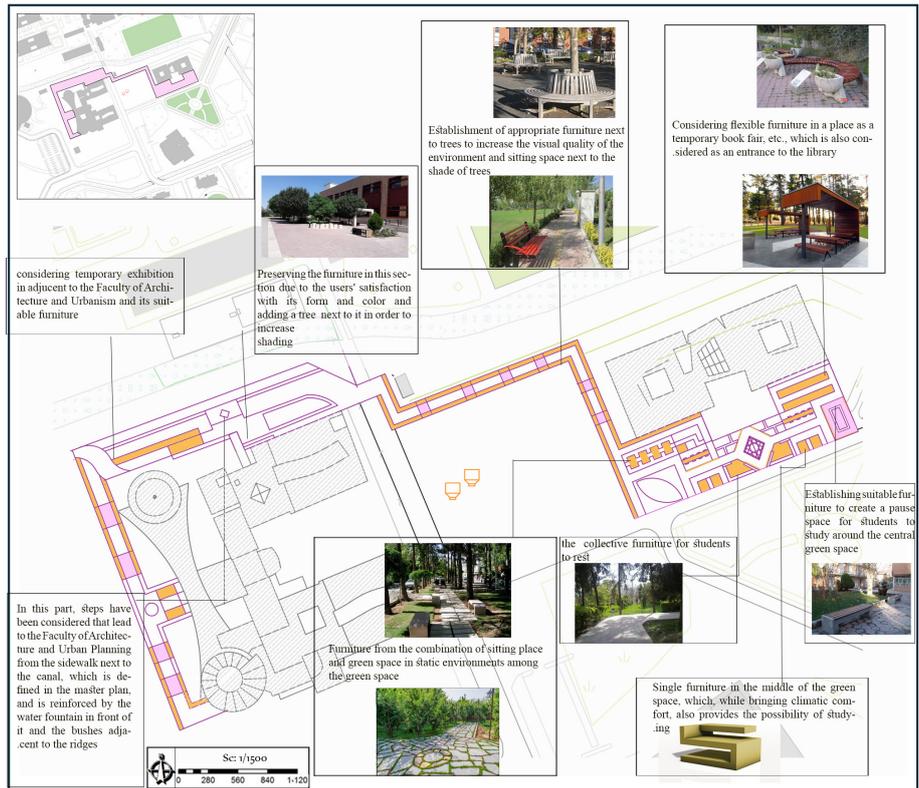


Fig. 6. Space Furniture in the Design Area

According to Table 3, one of the factors that audiences considered as the influential factor on the visual qualities of the educational spaces is the proper flooring. The proper flooring is effective in creating static and dynamic spaces. Also, the proper flooring affects the perception of the user from the space and improvement of the environmental quality. The point, line, and plane association are other factors

that affect the visual qualities of the environment based on the opinions of the experts and space users. Approximately, 40% of the space users mentioned it. In the following design, it was tried to enhance the prominent points by establishing a special element. Also, the association of the line can be provided for the space users by the extension of the flooring and trees, etc.

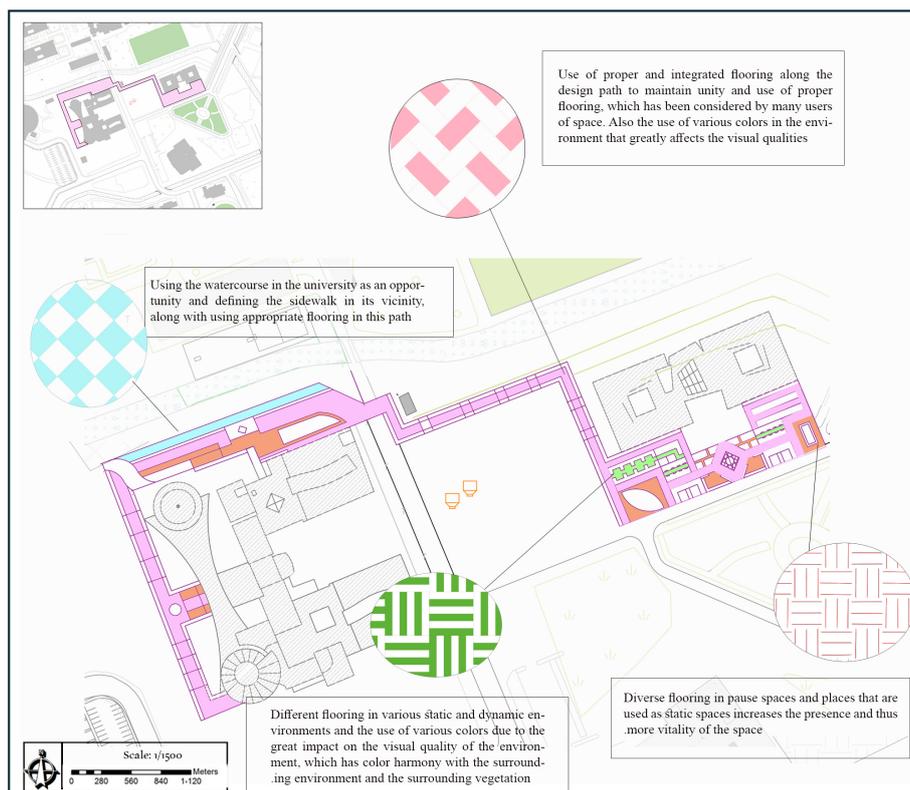


Fig. 7. Proposed Flooring in the Study Area

8. DISCUSSION AND CONCLUSION

In the current study, given the principal research purpose that is improving the educational environment and using the positive effects of the visual qualities based on the opinion of users to enhance the educational qualities, the landscape visual indicators and the most significant influential criteria on the visual qualities of the Ferdowsi University of Mashhad were extracted from the perspective of the academics. Also, the suggested solutions were represented to improve these qualities. The main difference between the current study and other similar studies was first, the investigation of the visual qualities based on the opinions of theorists, such as Simon Bell, Kaplan, Zangiabadi, Wang, and Chen. After examining the preferences of space users using a questionnaire, the degree of correspondence between the preferences of space users and the views of theorists has been examined. It is while other studies examined the preferences of the space users and the relationship between the opinions of the theorists and the users have not been addressed.

As presented in Table 4, the majority of the influential factors on the visual qualities based on the theorists' opinion are compatible with the preferences of space

users. Finally, by using the significant influential factors on the visual qualities based on the preferences of the users, the proposed design in the studied area was presented. The research results can increase the participation of the students and their survey in designing the surrounding environment and can be applied in the design of the educational spaces, such as the Ferdowsi University of Mashhad. The present study indicated that the criteria, including the proper vegetation and green spaces in the educational spaces, the use of proper color and furniture and optimal location, and the use of natural elements, such as water, have the most frequency. They are also the main elements in the preferences of the educational spaces' users. Also, the criteria of lack of using proper vegetation and green space, improper furniture and its optimal location, unclean space, and lack of order and discipline in the spay layout of the elements are among the weaknesses in the visual quality of the educational spaces based on the preferences of the users. Furthermore, the comparison and adaptation of the determining factors in the visual qualities based on the theorists' opinions and preferences of the users indicate the compatibility of most of these factors.

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