An Analysis of the Social Dimensions of Sustainable Urban Public Spaces with Emphasis on Users' Perception (Case Study: El Goli Park, Tabriz)

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Abstract

Urban public spaces are one of the key elements of the social and physical structure of cities, which play an important role in improving the quality of life, spatial justice, and sustainable development. The aim of this study is to analyze the social dimensions of sustainable development of urban public spaces with an emphasis on user perceptions. The theoretical framework of the study is based on Henri Lefebvre's theory of "social production of space," which considers space to include three dimensions: perceived, Conceived, and lived in this regard, the indicators obtained based on the theorists' perspectives were used to measure different dimensions of space. The present study was conducted in the field using a Likert-scale questionnaire. The statistical population consisted of four groups of users of El Goli Park in who were selected by random sampling. The data were analyzed using descriptive statistical tests and the Kruskal-Wallis test in SPSS software. The results of the analysis indicate that users' evaluations of the three dimensions of space differ from each other. The highest rankings were assigned by residents in the perceived and conceived dimensions of space, followed closely by user's evaluation of the lived space dimension, and both experts and students had lower scores. These findings were consistent with Lefebvre's theory about the importance of lived experience, place belonging and social status in our perception of space. The authors point to the importance of engaging with the mental, emotional and social dimensions of space in public policymaking and design of public spaces, they also give several key recommendations for participatory design, improving the quality of life of space, and ongoing evaluation with a focus on user experience.

Keywords: El-Goli Park, Lefebvre's theory, sustainable social development, Tabriz, urban public space, user perception

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1. Introduction

Sustainable urban development has become one of the most pressing priorities of contemporary cities, driven by the necessity of balancing environmental integrity, economic growth, and social equity. Within this broad paradigm, public spaces hold a pivotal position because they serve as arenas where social life is expressed, collective memory is shaped, and civic identity is consolidated. Urban public spaces such as parks, squares, and pedestrian zones play critical roles in enhancing quality of life, promoting social interaction, and facilitating cultural exchange. They are not merely physical infrastructures but rather multidimensional constructs that embody environmental, economic, and social processes. In particular, the social dimension of sustainability, often marginalized compared to environmental and economic concerns, is indispensable in ensuring inclusivity, accessibility, and spatial justice in cities [1-3].

The recognition of social sustainability highlights how public spaces shape everyday experiences. Indicators such as participation, equal access to facilities, sense of belonging, and social security significantly influence people's perceptions and lived experiences. Scholars have

argued that cities which fail to incorporate the social dimension of sustainability risk deepening inequalities and reducing urban livability [4, 5]. Studies across diverse contexts confirm that inclusive urban design and attention to users' perceptions of space can foster stronger community bonds and a greater sense of place [6, 7]. In this way, the quality of public spaces cannot be separated from the broader pursuit of sustainable urban development.

Public spaces are also sites where tensions between planned design and lived experience become visible. They reveal the gap between official representations of space, created by planners and policymakers, and the everyday realities of users. This insight draws heavily on Henri Lefebvre's theory of the social production of space, which emphasizes that space is not a passive container but is actively produced through the interplay of social, political, cultural, and economic forces [8, 9]. Lefebvre's triad of perceived, conceived, and lived space offers a nuanced framework for analyzing how urban spaces are experienced. Perceived space corresponds to the tangible, sensory aspects of urban environments; conceived space relates to the designs and discourses produced by urban professionals; and lived space refers to the symbolic, emotional, and cultural dimensions rooted in memory and meaning [10, 11]. By integrating these dimensions, researchers can better understand how user perceptions both reflect and shape the quality of public spaces.

Empirical studies demonstrate the salience of this framework. For instance, comparative research on pedestrian-friendly environments in Iranian cities has shown that perceived indicators such as walkability, safety, and accessibility are critical in fostering satisfaction with urban spaces [12]. At the same time, lived experiences influenced by climate, cultural practices, and social identity significantly mediate the meaning attached to places [13]. In the context of historical cities such as Kashan, spatial identity emerges at the intersection of lived memory, physical structures, and planned representations, illustrating how Lefebvre's triad reproduces spatial identity [4]. These findings collectively highlight that public space design cannot be evaluated solely on physical form but must consider the subjective and symbolic layers that give meaning to everyday life.

The global discourse on sustainable urbanism reinforces these insights. Increasingly, scholars stress the importance of integrating environmental performance with social cohesion and cultural identity [14, 15]. Urban heritage conservation efforts in contexts such as Saudi Arabia emphasize sustainable reuses that honor cultural continuity while addressing contemporary needs [16]. Similarly, the role of cultural heritage in promoting urban sustainability is recognized as vital for enhancing social interaction and civic participation [14]. At the same time, advancements in digitalization and governance have reshaped urban experiences, underscoring how technology can both support and challenge sustainability goals [1, 15]. For instance, the impact of digital government on enterprise transformation illustrates how institutional shifts influence urban economic sustainability, which in turn affects public spaces and community experiences [15].

Another critical dimension of contemporary research is the relationship between climate risk and urban sustainability. The increasing frequency of extreme weather events and the changing patterns of urban climates pose significant challenges to the planning and management of public spaces. Studies conducted in China highlight how comprehensive indices of climate risk intersect with urban sustainable development strategies [2]. These risks, when coupled with rapid urbanization, intensify pressures on both ecological systems and social infrastructures, making the design of resilient public spaces an urgent priority. Similarly, research on land surface temperature across cities of different sizes has shown that urban landscape patterns, particularly in two- and three-dimensional forms, directly influence environmental comfort and user perception [17]. These findings confirm that environmental and social dimensions of space are inseparably intertwined.

At the same time, the perception and use of public spaces are shaped by cultural and demographic differences. Comparative studies in Japan, for instance, demonstrate that both local and foreign users evaluate public spaces differently, reflecting diverse expectations of safety, accessibility, and comfort [18]. Research in Australia has emphasized how migrants' social inclusion is mediated by public space, where measurable outcomes such as participation intersect with individual perceptions of belonging and identity [19]. These examples illustrate the universality of Lefebvre's insight that space is a product of social relations, while also underlining the need for context-sensitive approaches to urban planning.

The integration of user perception into planning frameworks is not only an academic exercise but also a practical imperative. Frameworks for landscape protection in mobility planning reveal how user-centered approaches enhance the sustainability of soft mobility systems [20]. Similarly, performance assessment tools for smart

sustainable cities show that perceptions of place satisfaction, identity, and safety are as important as technical indicators in determining overall urban quality [7, 21]. These studies point to a broader shift in urban governance, where participatory and perception-based approaches are increasingly valued. Indeed, public–private partnerships in Indonesian cities have demonstrated that inclusive governance structures are crucial for sustainable urban development, especially when public perceptions are incorporated into decision-making [22].

The theoretical and empirical debates on sustainable urban public spaces converge on a central theme: the production and use of space must be understood as both material and symbolic, shaped by user perception as much as by physical design. Urban sustainability therefore requires a multidimensional approach that recognizes how conceived plans, perceived realities, and lived experiences interact. Lefebvre's triadic model continues to offer a powerful lens for analyzing these dynamics and for guiding the creation of inclusive and resilient public spaces [8, 9]. Furthermore, the notion of differential space and the right to the city resonates with contemporary calls for more participatory and just urban policies, ensuring that public spaces serve diverse communities rather than reproducing social inequalities [10].

Against this backdrop, the present study focuses on El-Goli Park in Tabriz as a case study to examine the social dimensions of sustainable development in urban public spaces with an emphasis on users' perceptions.

2. Methodology

The city of Tabriz with an area of about 25056 hectares is located at 38 degrees and 1 minutes to 38 degrees and 8 minutes north latitude and 46 degrees and 5 minutes to 46 degrees and 22 minutes east longitude. The average height of the city is estimated to be about 1,460 meters above sea level. It has ten municipal districts, each with its own area and boundaries. Tabriz city is located in the northwest corner of the country and along the Tehran-Bazargan international axis that connects Iran to Europe. El Goli Park, located in District 2 of Tabriz Municipality, starts from the cable bridge and after passing through the two intersections of Khayyam Square and Golshahr Square, it is connected to El Goli Park and finally connects to the Kasaei Highway and the southern bypass of the city. El Goli Park or Shah Goli is one of the most important tourist attractions in Tabriz city, located in the southeast of Tabriz and 7 kilometers from the city center. The construction of the initial structure of this reservoir is attributed to the time of King Aq Qoyunuha and its development to the Safavid period. The approximate area of this complex is about 55 hectares, and its most prominent physical feature is the existence of an artificial lake with an area of 5.5 hectares with an average depth of 12 meters, in the center of which is a historical building with traditional Iranian architecture.

The research method in the present article is mainly descriptive, analytical and field. The required information was collected through a comparative-analytical method and by using library resources, documents, reports and referring to organizations such as Tabriz Region 2 Municipality and the Parks and Green Space Organization. The most important part of the research is the field surveys including panoramic photography and objective observations of El-Goli Park. In this research, an attempt has been made to explain the impact of El-Goli Park on urban public spaces and, using the results, to provide a tool for improving the quality of urban public spaces as important elements in the city structure. To compile the questionnaire, 21 questions were designed based on Henri Lefebvre's theory, including three categories of "perceived space", "Conceived space" and "lived space". These questions were analyzed and prioritized by domestic, foreign, and mixed experts and the extraction of relevant indicators, and were examined in separate tables for each group, and finally, the conceptual model of the research was developed. The questions designed in the three sections were categorized and used to collect data from four target groups. Data analysis was performed using SPSS software.
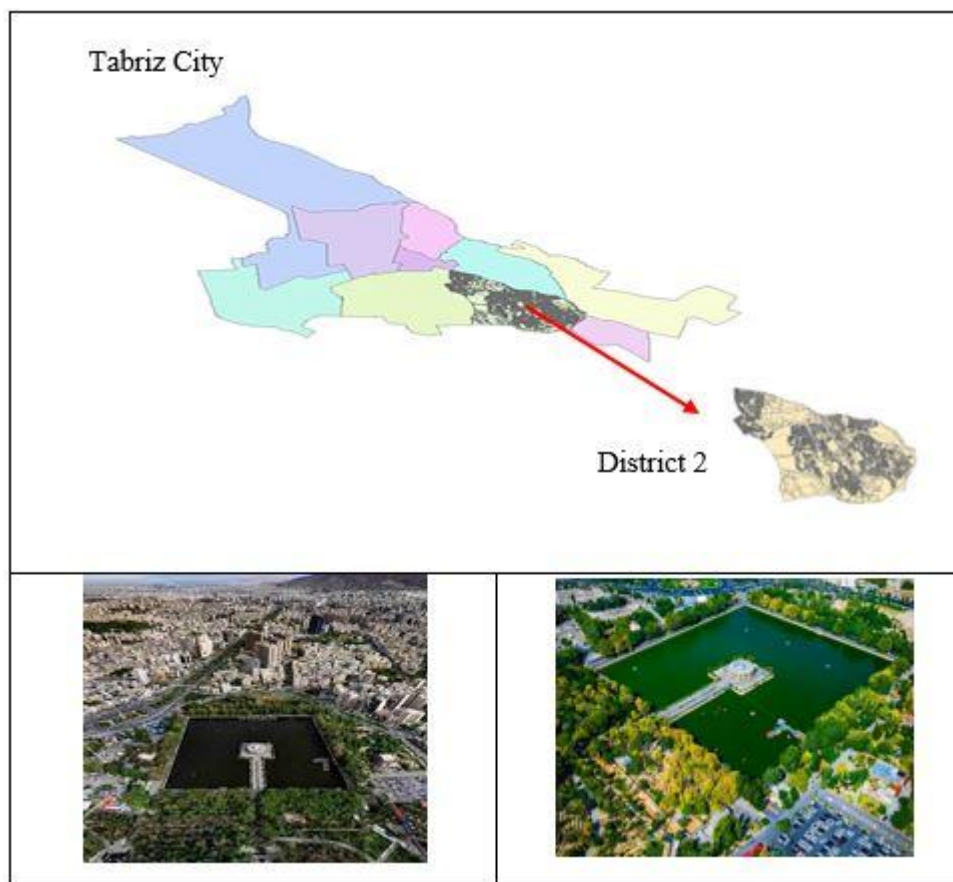
Figure 1. Study area: El Goli Park, Tabriz

In addition to the questionnaires, the field assessment of El-Goli Park by the author was also part of the data collection and final analysis process. The data collection tool included a structured questionnaire that was distributed among the four target groups. These questionnaires were prepared in Persian, and for the study of foreign tourists, a version in English was also prepared and completed in person. The questionnaire included 21 questions in the three axes of Lefebvre's theory. The statistical population of the study consisted of four groups:

1. Experts: Including professors of Tabriz National University. Out of 80 people, 73 questionnaires were collected in full.

2. Students: Including architecture students of Tabriz Sarari University. A total of 82 questionnaires were distributed, of which 71 were completed and analyzed.

3. Users: Including users of the park area and passers-by. To determine the sample size of passers-by, the interviewer visited the site over several consecutive days and collected about 38 questionnaires from passers-by. Also, 45

questionnaires were distributed to users, of which 36 were completed.

4. Neighborhood residents: Including residents and businessmen of the neighborhood. A total of about 80 questionnaires were distributed, of which 74 questionnaires were collected in full.

The final questionnaire, consisting of 21 questions, 7 questions about perceived space, 7 questions about Conceived space, and 7 questions about lived space, was designed based on Lefebvre's theory and indicators extracted from the perspectives of urban space theorists and was provided to the target groups. Finally, the data were analyzed using SPSS software, matched with relevant tables, and a final summary was made. Also, in this study, statistical analyses and graphs were performed to analyze and examine the relationships between variables using the Python programming language. In particular, the powerful pandas libraries were used for data management, seaborn for drawing statistical graphs, and matplotlib for graphic settings. To clearly determine the intensity and direction of the relationships between the variables of "perceived space",

"Conceived space", and "lived space", a heat map was drawn using the Spearman correlation method. Also, a pairwise diagram was prepared to examine the data distribution and the pairwise relationship between the variables in the form of scatter plots and histograms. The use of these software tools enabled accurate and reliable analysis of data and contributed to a better and more scientific interpretation of the relationships between variables.
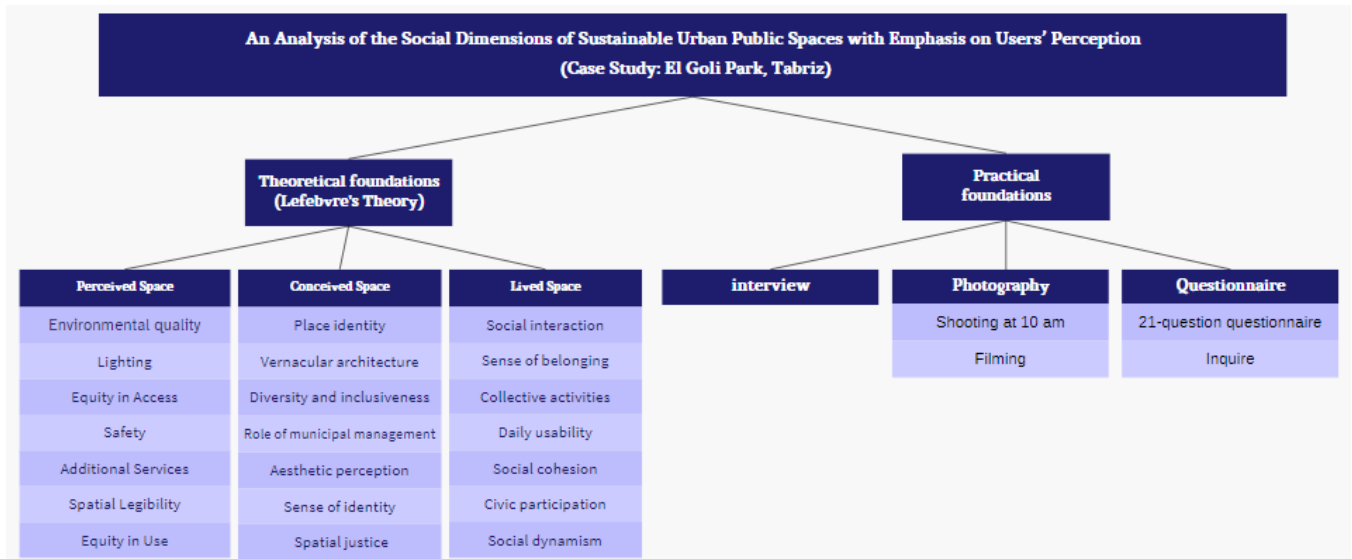

Figure 2. Conceptual model of research

3. Findings and Results

To assess users' perceptions of urban public spaces, three conceptual dimensions based on Lefebvre's theory were examined, including Perceived Space, Conceived Space, and Lived Space. Of the total of 288 questionnaires, 280 valid data items were recorded. The percentage of missing data was less than 3%.

Table 1. Descriptive analysis

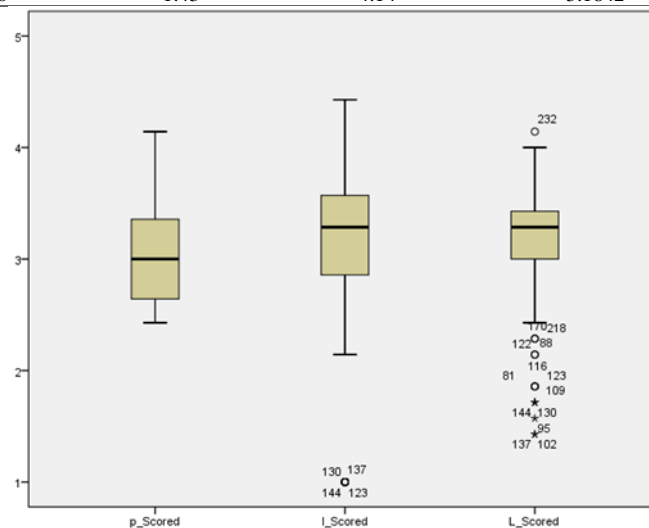|	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Space	280	2.43	4.14	3.0561	.44824
Conceived Space	280	1.00	4.43	3.1888	.67674
Lived Space	280	1.43	4.14	3.1842	.44256

Figure 3. The minimum and maximum calculated values for each dimension

In order to analyze and examine users' perception of urban public spaces in the form of three conceptual dimensions according to Henri Lefebvre's theory of "perceived space", "Conceived space" and "lived space", descriptive statistical indicators including mean, standard deviation, minimum and maximum values were calculated for each dimension. As shown in Figure 2, the mean of all three dimensions is around 3, which indicates the average overall perception and experience of users of the public space of this park. Conceived and lived space have a relatively higher mean than perceived space, and the dispersion in Conceived space is greater.

The results showed that:

• The average of the Conceived space (I_Scored) with a value of 3.18 was higher than the other dimensions. This finding indicates that users have a relatively positive image of the El Goli Park space in their mental and ideal level.

• The lived space (L_Scored) is also at the same level with a mean of 3.18, indicating that users' actual experiences are also in line with their mental images of the space. This convergence can indicate a relative fit between the actual spatial quality and individuals' mental expectations.

• In contrast, the perceived space (p_Scored) with a mean of 3.05 has the lowest value among the three dimensions. This may indicate that users' practical perception of the quality of spatial components (such as cleanliness, security, accessibility, and equipment) is slightly lower compared to the level of expectations and mental perception.

In terms of dispersion, the Conceived space with The standard deviation of 0.67 has the highest diversity of views, indicating the diversity of users' expectations and mental images of the park. In contrast, the lived space is more homogeneous with a standard deviation of 0.44, indicating more similar experiences of users in actual use of the park.

Before choosing the appropriate method for inferential statistical analyses, it is essential to examine the data distribution
for normality. For this purpose, two statistical tests, Kolmogorov–Smirnov and Shapiro–Wilk, were performed to assess the normality of the distribution of the main research variables (perceived space, conceived space, and lived space). Table below shows the results of these tests for all three variables:

Table 2. Results of the data normality test for the three main research variables

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perceived space	.110	280	.000	.942	280	.000
Conceived space	.116	280	.000	.926	280	.000
lived space	.121	280	.000	.915	280	.000

a. Lilliefors Significance Correction

To examine the possibility of using parametric tests, a normality test was performed on the three main variables (perceived, Conceived, and lived space scores). The results of both Kolmogorov–Smirnov and Shapiro–Wilk tests showed that the distribution of all three variables deviated significantly from normality (Sig. < 0.001). Given that the Shapiro–Wilk test is more appropriate for sample sizes less than 500, it can be concluded that all three variables have a non-normal distribution.

Therefore, nonparametric tests such as Spearman's correlation and nonparametric comparison tests were used in subsequent analyses.

Spearman's rank correlation test was used to investigate the relationships between the three conceptual dimensions of space (perceived space, conceived space, and lived space) defined in the framework of the theory of social production of space from Henri Lefebvre's point of view. This test is considered an appropriate choice for analyzing the relationship between different dimensions of spatial perception due to the non-normality of the data and the ordinal nature of the variables. Table below presents the correlation coefficients and the level of significance of the relationships between these three dimensions:

Table 3. Spearman's correlation coefficients between the three dimensions of space

			Perceived space	Conceived space	Lived space
Spearman's rho	Perceived space	Correlation Coefficient	1.000	.746**	.274**
		Sig. (2-tailed)	.	.000	.000
		N	280	280	280
	Conceived space	Correlation Coefficient	.746**	1.000	.405**
		Sig. (2-tailed)	.000	.	.000
		N	280	280	280
	Lived space	Correlation Coefficient	.274**	.405**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	280	280	280
**. Correlation is significant at the 0.01 level (2-tailed).					

Spearman's rank correlation test was conducted to examine the relationships between the three spatial dimensions—perceived, Conceived, and lived space. The results showed:

• There was a strong and positive correlation ($\rho = 0.746$, $p < 0.001$) between perceived space and Conceived space, indicating a close relationship between users' functional perception of space and their mental and symbolic perceptions.

• A moderate and positive correlation ($\rho = 0.405$, $p < 0.001$) was observed between Conceived space and lived space, indicating that people who have a positive mental image of space are likely to report a better lived experience of it.

• A weak but positive correlation ($\rho = 0.274$, $p < 0.001$) was found between perceived space and lived space. This result suggests that users' objective perception of the physical components of space is only to a limited extent related to their actual experience.

All correlations were significant at the 0.01 level, indicating the reliability of the relationships between different dimensions of spatial perception.

In this study, Spearman correlations were calculated and analyzed between the three dimensions of social space based on Lefebvre's theory of social production of space, including perceived space (p_Scored), Conceived space (I_Scored), and lived space (L_Scored).

The results of the correlation analysis showed that there is a positive and very strong correlation between perceived space and Conceived space with a coefficient of 0.746 ($p < 0.01$). This finding indicates that people's perception of space (perceived space) has a direct and significant relationship with the type of mental image and idea they have of space (Conceived space); meaning that the higher the quality and structure of the Conceived space, the higher the perceived space is.

Also, lived space has a moderate positive and significant relationship with both other variables; The Spearman correlation coefficient between lived space and perceived space is 0.274 ($p < 0.01$) and between lived space and Conceived space is 0.405 ($p < 0.01$). These results imply that people's lived experience of space (lived space) is influenced by both their perception and mental image of space, but this relationship is weaker than the other two dimensions.

Pair plots also confirm the positive distribution and pattern of these variables, indicating a relatively uniform dispersion of the data and the absence of influential outliers, which strengthens the quality of the data and the validity of the correlation analysis.

Overall, these results are consistent with Lefebvre's theoretical assumptions and emphasize that social space, as a multidimensional and continuous process, shapes perception, imagination, and lived experience in a related and interactive way.
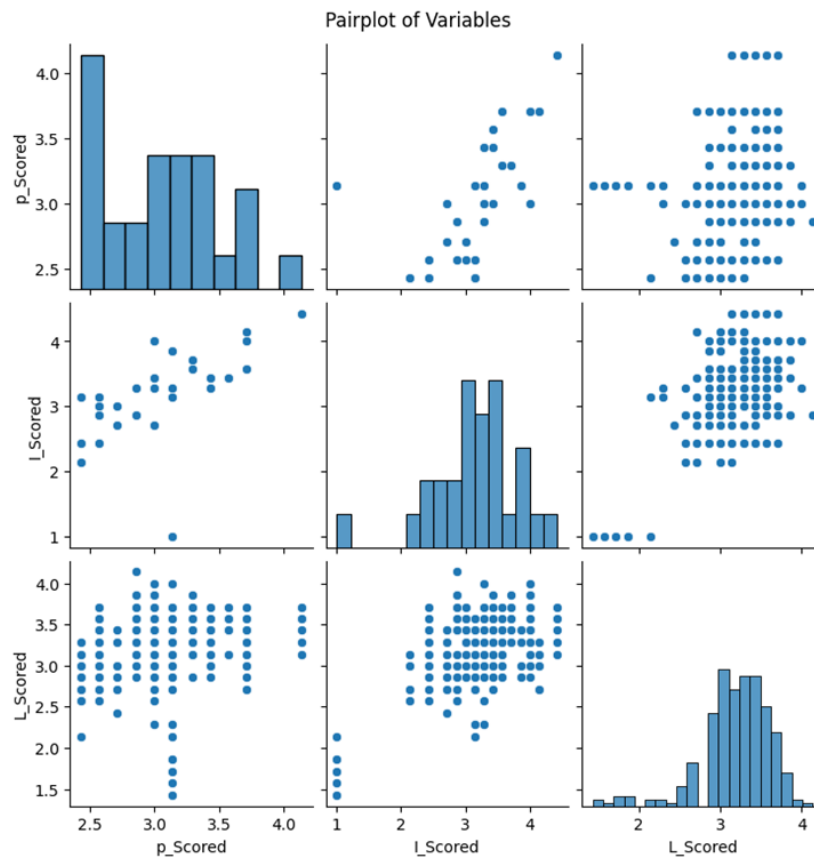
Figure 4. Pairplots of the three variables: perceived space, Conceived space, and lived space.
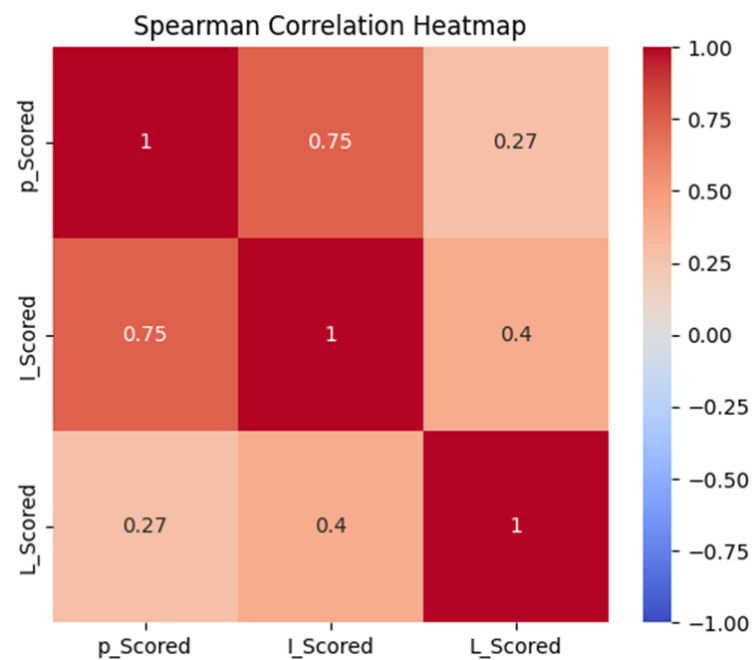

Figure 5. Spearman correlation heat map of three variables: perceived space, Conceived space, and lived space

This test was conducted to examine the differences in the evaluation of social dimensions of the quality of public spaces (perceived space, conceived space, and lived space) between four user groups: users, students, neighborhood residents, and experts/specialists in El-Goli Park, Tabriz.

Table 4. Results of the Kruskal–Wallis Test for Differences Between User Groups in the Three Spatial Dimensions

User Group	Perceived Space	Conceived Space	Lived Space
General Users	141.21	141.39	184.70
Students	132.64	121.39	107.50
Neighborhood Residents	178.36	174.79	123.71
Experts and Professionals	109.79	123.39	146.09
Spatial Dimension	Chi-Square	df	Asymp. Sig.
Perceived Space	26.373	3	.000
Conceived Space	19.544	3	.000
Lived Space	36.313	3	.000

To examine the differences between user groups (users, students, neighborhood residents and experts/specialists) in three dimensions of urban space (perceived, conceived and lived space), the non-parametric Kruskal–Wallis test was used. The results are as follows:

• Perceived space: The Kruskal–Wallis test showed a significant difference between the groups (Chi-square = 26.373, df = 3, p < 0.001). The highest average rank belongs to neighborhood residents (178.36) and the lowest to experts and specialists (109.79). This indicates that residents are more sensitive to the perception of space compared to other groups.

• Conceived space: A significant difference between the groups was also observed in this dimension (Chi-square =

19.544, p < 0.001). Neighborhood residents had the highest average rating (174.79) and students had the lowest (121.39).

• Living space: This dimension showed the greatest difference between the groups (Chi-square = 36.313, p < 0.001). Unlike the other two dimensions, the highest average rating belonged to space users (184.70) and the lowest average belonged to students (107.50).

The grouped bar chart also displays these differences well and allows for a three-dimensional visual comparison between the groups. These differences could be due to the type of exposure, the level of presence, and the role of the users in the public space under study.
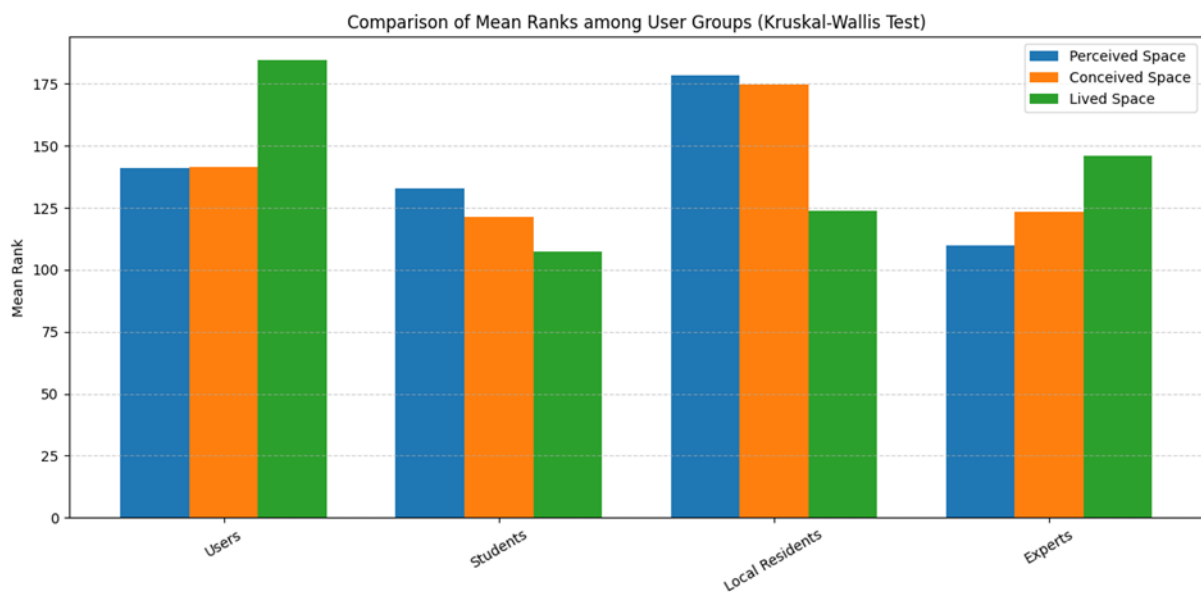

Figure 6. Comparison of Mean Ranks among User Groups

Kruskal–Wallis trivariate analysis showed that user type had a significant effect on the evaluation of different dimensions of public space quality. In particular, neighborhood residents had the highest satisfaction in the two dimensions of perceived and Conceived space, while users reported the most positive experience in the lived space. Students and experts had lower scores on all three dimensions, which may be due to their more critical perspective or different exposure to the space.

4. Discussion and Conclusion

The findings of this study demonstrate that users' evaluations of urban public spaces are multidimensional, corresponding to the triadic structure of perceived, conceived, and lived space proposed by Henri Lefebvre. Statistical analysis revealed that the mean values of these dimensions were close to average but varied across user groups, with conceived and lived space obtaining slightly higher evaluations than perceived space. This indicates that while users' mental images and symbolic associations with El-Goli Park remain relatively positive, their practical experiences of accessibility, cleanliness, and security are somewhat less satisfactory. Moreover, the Kruskal–Wallis results showed significant differences across groups: residents scored higher in perceived and conceived dimensions, users reported more positive lived experiences, and experts and students consistently rated the space lower. These results provide critical insight into how social roles and degrees of spatial attachment shape evaluations of public spaces, confirming that urban space cannot be interpreted as a uniform experience but rather as a differentiated and socially constructed reality [8-10].

The strong correlation between perceived and conceived space ($\rho = 0.746$, $p < 0.01$) further underscores the relationship between physical experience and mental representations. This finding is consistent with Lefebvre's assertion that conceived spaces—those designed and envisioned by authorities—shape, and are simultaneously shaped by, the ways people perceive their everyday environments [10]. The moderate correlation between conceived and lived space ($\rho = 0.405$, $p < 0.01$) also highlights the importance of alignment between planning discourses and lived experiences. When mental images of space correspond to actual practices and feelings of belonging, the resulting synergy strengthens the overall social quality of urban spaces. Conversely, the relatively weaker correlation between perceived and lived space ($\rho =$

0.274, $p < 0.01$) points to a persistent gap between the objective conditions of space and the subjective experiences of users. This gap has also been noted in comparative studies of public spaces, where physical improvements in accessibility and design have not always translated into higher levels of emotional attachment or satisfaction [6, 7].

The higher ratings given by residents in the perceived and conceived dimensions suggest that continuous exposure and stronger place attachment enhance satisfaction with both physical features and symbolic representations of space. This aligns with research emphasizing that residents' sense of spatial identity and belonging is reinforced by ongoing interaction with their immediate environment [4, 14]. Conversely, the highest lived space scores by general users indicate that recreational and leisure-oriented interactions can generate positive experiential evaluations even if practical indicators such as security or maintenance are less favorable. These findings are in agreement with prior work that identifies the recreational value of urban parks as a driver of satisfaction and social cohesion [11, 13]. The lower evaluations by experts and students can be attributed to their more critical perspectives and heightened awareness of planning inefficiencies, echoing studies in Japan and Australia that noted generational and educational differences in how public spaces are perceived [18, 19].

These findings also resonate with broader global debates on the social sustainability of cities. Scholars argue that successful urban development requires attention not only to ecological and economic outcomes but also to inclusivity, equity, and cultural identity [1, 2]. For example, in China, assessments of extreme climate risks emphasize that social resilience in urban settings must be measured alongside environmental indicators [2]. Similarly, digital governance and heritage conservation initiatives highlight that user experience and cultural continuity must remain central to urban transformation strategies [15, 16]. The present findings reinforce these claims by demonstrating that conceived and lived spaces are powerful determinants of how urban residents and visitors evaluate sustainability at the micro level of parks and open spaces. In other words, broader strategies for urban resilience and modernization cannot succeed without ensuring that social perceptions remain positive.

The evidence from El-Goli Park also underscores the significance of cultural and historical context in shaping urban sustainability. The positive evaluations of lived space, especially among casual users, highlight the enduring recreational and symbolic value of this historic park. Studies

of heritage cities such as Kashan confirm that spatial identity is sustained through the interplay of lived memory, conceived discourses, and material forms [4]. Likewise, research into the cultural heritage–sustainability nexus indicates that safeguarding cultural landscapes fosters not only historical continuity but also social participation and cohesion [14]. By maintaining El-Goli Park as both a historical and recreational space, Tabriz exemplifies how integrating heritage into urban life contributes to sustainable development goals.

The relationship between urban design and social cohesion is further clarified by comparing the findings with studies from other contexts. Virtual reality experiments in urban design have shown that perceptions of safety, accessibility, and identity significantly influence social interaction and cohesion [6]. Likewise, European studies on soft mobility and landscape protection stress that user perception must guide infrastructure planning in order to reconcile ecological sustainability with social inclusivity [20]. The strong positive correlation between conceived and perceived space in the current study confirms this principle: when users' practical experiences are in harmony with planning intentions, satisfaction and social interaction are reinforced. However, the weaker relationship between perceived and lived space highlights the ongoing challenge of ensuring that everyday conditions of cleanliness, safety, and accessibility meet users' symbolic and emotional expectations. This challenge has been noted in assessments of smart sustainable cities, where technical efficiency did not always translate into improved perceptions of identity and belonging [7, 21].

Another dimension of the findings is the importance of environmental conditions in shaping spatial experience. The lower average values of perceived space in El-Goli Park, compared to conceived and lived spaces, may reflect concerns about environmental quality, maintenance, and safety. Similar results were reported in Tabriz parks, where ecological indicators were found to be critical in determining user satisfaction [11]. Moreover, climatic factors have been shown to influence mental schemas and perceptions of space, reinforcing the idea that environmental comfort and natural features shape not only physical experiences but also symbolic and emotional associations [13, 17]. Thus, while El-Goli Park continues to hold positive symbolic and recreational value, improving environmental quality and management practices is essential to strengthening users' everyday perceptions.

The divergent evaluations across user groups also have important implications for participatory planning. The relatively high satisfaction among residents in perceived and conceived dimensions demonstrates the value of incorporating local perspectives into design and management. This supports findings from participatory governance models in Indonesian cities, which emphasize that public–private partnerships rooted in user engagement yield more sustainable urban outcomes [22]. By contrast, the lower scores by experts and students underline the need to address critical feedback from stakeholders who may identify inefficiencies or shortcomings invisible to casual users. Balancing these perspectives is essential to creating spaces that are both symbolically meaningful and functionally effective.

Finally, the study's findings must be situated within the theoretical framework of Lefebvre. The significant correlations among the three spatial dimensions and the differentiated evaluations across groups confirm that urban space is socially produced, shaped by the interaction of physical forms, planning discourses, and lived experiences [8, 10]. The higher emphasis on conceived and lived dimensions suggests that symbolic and experiential aspects of space may weigh more heavily in user evaluations than physical indicators alone. This finding resonates with Lefebvre's notion of differential space, which resists homogenization and reproduces diversity and identity [9]. It also aligns with global debates on digitalization, climate risk, and heritage conservation, all of which emphasize the social dimension as central to sustainability [1, 2, 16]. By demonstrating that user perceptions directly shape evaluations of public space, this study contributes to bridging theoretical perspectives with practical urban design and policymaking.

This study is not without limitations. First, it is geographically limited to El-Goli Park in Tabriz, which, while historically and culturally significant, may not represent the diversity of public spaces across other Iranian or international contexts. Second, the reliance on self-reported perceptions introduces subjectivity that may be influenced by temporary moods, situational factors, or seasonal conditions during data collection. Third, although the statistical analysis was robust, the cross-sectional design prevents causal interpretations, and the study could not capture how perceptions evolve over time. Finally, while the study included diverse groups—residents, users, students, and experts—the sample sizes within each group were not

perfectly balanced, which may have affected the comparability of results.

Future studies should expand the scope beyond a single park to include different types of public spaces, such as squares, pedestrian streets, and heritage sites, in order to capture the diversity of urban experiences. Longitudinal designs could provide insight into how perceptions shift over time, particularly in response to environmental changes, policy interventions, or cultural transformations. Future research might also integrate mixed methods by combining quantitative surveys with qualitative interviews, focus groups, or ethnographic observations to gain a richer understanding of lived experiences. In addition, comparative international studies could highlight how cultural, climatic, and political differences shape user perceptions of public spaces, offering broader generalizability and cross-cultural perspectives.

In practice, urban planners and policymakers should prioritize participatory design processes that involve residents and other users directly in decision-making. Continuous evaluation mechanisms, such as periodic surveys or digital feedback platforms, should be institutionalized to monitor user perceptions and adjust management strategies accordingly. Efforts should also focus on improving environmental quality through better maintenance, enhanced safety measures, and sustainable ecological practices, thereby strengthening the perceived dimension of space. At the same time, policies should safeguard the symbolic and cultural value of historic spaces to preserve their role in shaping collective identity. By integrating conceived, perceived, and lived dimensions into planning and management, cities can ensure that public spaces not only serve functional needs but also foster belonging, inclusivity, and resilience in the long run.

Authors' Contributions

Authors equally contributed to this article.

Declaration of Interest

The authors report no conflict of interest.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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