

## Characteristics and Design Elements of Open Educational Space based on Social Trust, Social Learning and Interaction from Professionals' Point of View

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### Abstract

The present study aimed at providing a number of guidelines for the design of children's open learning spaces based on the promotion of social trust and social interactions. It was an exploratory research conducted based on both qualitative and quantitative methods. At the primary part of the research, which is the focus of this article, a qualitative method was applied, using three rounds of Delphi. Consequently, professionals were interviewed in an unstructured way in the field of landscape architecture and social psychology. Then, with the techniques of open and axial coding, a table of content was created to manage questionnaires. Network sampling method (snowball) was used in the sample size of 10 professionals. The data were analyzed using Q factor analysis and four factors were recognized. The most affecting elements on the social trust in process of learning in open primary school spaces are consisted of; social, design, physical spaces and environmental psychology dimensions.

**Keywords:** Social trust, social interactions, open educational spaces, social learning and Q factor analysis

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### Introduction#

Social trust, as a subset of social capital, is defined as the acquired expectations and commitments that individuals have towards each other and the institutions that are related to their social lives. Trust has interpersonal, institutional, and generalized dimensions. The combination of these dimensions forms social trust.

Some social trust theorists, including Giddens, have defined trust as the assurance concerning the quality or attribute of a person or thing or the truth of a statement. To these theorists, trust is the starting point of any organization thereof (Thalasi, 2005). Giddens (2005) also defined trust as one's attitudes towards herself/himself and the world around. Referring to the differences between pre-modern and modern societies, Giddens believed that the basic necessity of life in modern societies is trust. A very important point to

consider here is that social trust, in the form of goodwill towards individuals, is different from individuals' senses of belonging to their ethnic groups and tribes (Amirpour, 2007).

Previous systems of societies were formed on the basis of kinship, religious beliefs, local community, and traditions (Amirpour, 2007), indicating that the development of societies requires social interactions and a network of complex relationships. Therefore, it is not possible to create such close relationships without trust as the basis for stable social relations. According to Zemtuka, this requires a culture, known as the culture of trust, which is not only a source of trust but also a background for it.

It seems that the main component of all sustainable social relationships and interactions is trust, and it is the necessary requirement for solving social problems (Zakai & Roshanfekar, 2006). Therefore, trust, both as a

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feature of social structure and as a capacity, plays an important role in social development and is an important index for measuring social progress (Aram & Roshanfekr, 2015). In this regard, Golabi (2004) believed that interpersonal trust encompasses a range of interactions, which contains both trustworthy and trusted parties, including friends, colleagues, teachers and students, and so forth. Schultz sees trust as a factor in creating peace, security, and mental health. He believes that in trusted environments, people are less likely to be at the risk of compromising their needs. Trust is a necessary component for the formation of bonds, cooperation, and collaboration (Abdullah Zadeh Fard, 2018). Such qualities are the main requirements of educational spaces.

Putnam believed that social trust is divided into norms of mutual participation, civic participation, social networks, and successful cooperation, which mutually reinforce each other. Trust facilitates coordination and cooperation. The higher the level of trust in the target community is, the higher the likelihood of cooperation in that society will be. Cooperation, therefore, builds trust, which is very important in educational settings (cited in Abdullah Zadeh Fard, 2018).

According to the radius of trust, Putnam referred to two types of personal and social trusts (generalized). Putnam also believes that the radius of social trust goes beyond the relatives and becomes a factor for widespread cooperation in the community. According to him, increasing participations and interactions can be reached through enhancing trust and transforming interpersonal trust into social trust (Abdullah Zadeh Fard, 2018).

The amount of social trust (all dimensions of social trust) at both national level (in Iran) and in the city of Tehran is quite low. Meanwhile, interpersonal trust, which is limited to family, friends, and acquaintances, is at a higher level in comparison with social trust in Iran. It is clear that the radius of trust in the Iranian society is very limited (Aram & Roshanfekr, 2015) and requires special attention and planning, especially from an early age.

In this study, communication is considered as a basis for trust and participation. It seems that the limitations in relationships cause the reduction of trust and therefore cooperation and participation. The important point is that trust and social interactions have the characteristics of dynamism and self-development. Therefore, the more they are used, the more they get increased.

With regard to the relationship between social trust and physical space, it should be asserted that social trust, as relationships and actions or features of the social structure, has an undeniable impact on community-based developments. The effectiveness of trust, as a

subset of social capital, requires coherence between physical and human capitals, meaning that communities grow in mental and objective dimensions only if human capital is accompanied by physical capital (Nejati Hosseini, Kowsari, 2014).

Physical capital, which plays a decisive role in social development, can be restored through achieving trust, cooperation, and responsibility. Physical capital also improves the quality of collective life and contributes to the efficiency of other capitals. Researches have shown that the lowest levels of social capital and trust (as one of its indexes) are associated with the lowest level of physical capital. Social capital with its indexes such as awareness, participation, and spontaneous and voluntary relationships maintain the physical capital. However, relationship with the environment and creation of quality human environments do not occur without creating a sense of belonging in human beings. Such senses of belonging translate into a deep relationship with the environment. Therefore, improving the physical and functional quality of open educational spaces has a significant effect on increasing students' senses of belonging and fitting in (Heydari, 2013; Zakai & Roshanfekr, 2006).

In addition, trust has an influential effect on creating public spaces and social environments (Zmetoka, 2008). The more the sense of belonging to a space is, the more trust and consequently participation and cooperation in that space will emerge. It can be a factor to connect people with their physical and social environments (Ghaffari, 2013 cited in Heydari, 2013). Gehl believed that facilitating social interactions and regenerating social spaces can be achieved through developing trust (Bagheri, 2007; Gehl, 2008). This is because increasing social interaction depends on strengthening trust (Abdullah Zadeh Fard, 2018). Consequently, the notions that promote social interactions are considered equivalent to the notions of increasing and developing trust. Therefore, if we consider the educational space as a setting for learning, the open space of these places are considered as bio-social places. This means that the physical space acts as a place of social interaction, and since the learning community needs to socialize and assemble, the two cannot be separated.

Physical factors, including accessibility, visual attractions, and natural factors, are able to induce dynamic interactions in settings that provide the necessary conditions for movement and stillness. By exploring public spaces, White considers social life as closely related to the quality of life. According to him, people communicate with spaces that they feel comfortable in and can easily access (Gholambardzfoli & Naghizadeh, 2014).

Lang (2002) considered social interaction and the dependency of individuals in close connection with their constructed environments. Spaces for action and interaction, in his view, are the ones that provide comfort and security and take issues such as culture and social habits into account. He also introduces the balance between privacy and social interaction in space as an important factor in establishing social relationships. Porta also considers stability as the result of the interaction of physical and design characteristics.

By examining the facilities of living in a public space, Gehl (2008) believed that physical spaces cannot have a direct impact on the quality, content, and rate of social interactions, but designers and planners can influence the likelihood of meeting and initiating activities in this way. He categorized public space activities into three categories, namely essential, selective, and social. He stated that the first two factors are grounds for the third one. In order for these activities to continue, the environment must provide security, comfort, and enjoyment for its users. Carr (1992) considered public environments as spaces for overcoming the daily anxieties. He asserts that comfort, passive engagement with the environment, active engagement, and exploration fulfil the five basic needs of people and are the reasons why they turn into public spaces. Lenard and Lenard also elaborated on social goals in designing a public space that facilitates activities. These goals are safety conditions, strengthening the sense of belonging to the community, creating a sense of importance in the individual, arousing curiosity in the individual, and creating a memorable experience for the individual (Gholambardzfoli & Naghizadeh, 2014).

Social interactions also create participation. Participation includes concepts such as partnership, collaboration, sharing, responsibility, self-governance, self-reliance, and decentralization (Saeedi, 2003; cited in Panahi, Kaviani & Daha, 2015). According to such definitions of participation, it seems that interactions lead to social interactions and behaviors. Another important point concerning the importance of participation is that one of the important components in the positive behavior of any society (with any size) is participation. Participation means “conscious, voluntary, and collective process with specific goals for sharing resources to sustain and control livelihoods” (Gholizadeh, Mostafa Pour & Ahadzadeh, 2015). It also increases stability and order by involving a significant size of people in the management of the community (Panahi, Kaviani & Daha, 2015).

There are various patterns of participation to enhance interactions. Moreover, participation can occur at different levels. The first one is a pretense of

participation, which is a form of deception. Another type is participation through commenting, whether it leads to action or not. The next level is the superficial acceptance of participation as a participatory model where participation among individuals is very limited. In addition to polling, it also involves small and occasional actions. The real model of participation, however, includes involvement in all of the above stages and affairs (Gholizadeh, Mostafa Pour & Ahadzadeh, 2015).

In other areas, the main essences of participation are conflict, activity, and influence. Based on this definition, there are three important components, namely involvement, helping, and responsibility. A deep understanding of these components requires a brief overview of them (Panahi, Kaviani & Daha, 2015). The first one is the mental and emotional conflict. It means that participation is not limited to physical efforts but involves individual psychology. The second one is related to the motivation of people to help others. In fact, in this way, people find opportunities to use their abilities and initiatives to achieve group goals. The last one is the responsibility that motivates the individual to be responsible in social activities. Participation is achieved when indifference and irresponsibility give way to a sense of belonging and responsibility. In this way, a spontaneous level is created by voluntary presence, which becomes a factor for further cooperation among individuals (Nejati Hosseini, Kowsari, 2014).

Finally, it should be noted that there is a distinction between participation as a state and participation as an action and commitment. The first view is related to the sense of belonging to a particular group and having a share in it. The second view is concerned with the fact that living in a social environment introduces rights and duties for an individual (in both physical and social dimensions) (Roshanfekar, 2015). Overall, social participation in a shared living space seems to include activities through which members of that community or group bring social life to their places (Rahnama & Rezvani, 2012).

Moreover, space can be considered a place for collective activities. People and space interact closely with each other, and space can shape people's minds. Therefore, not only does open space mean the remaining and empty spaces that are distinguished from the mass, but also in a higher sense, it includes people, events, and the relationships among them (Habib, 2008). Such a definition of space inclines towards the concept of place.

As place contains the characteristics of physical borders, activity, and meaning, it is placed in a position beyond the casual meaning of space. In this process, meaning is introduced as the main part. In his theory of place, Canter asserted that the components of place are functional differences, spatial goals, scale, interaction

and design elements. Gustafson also believes that the formation of meaning is related to the interactions between people and their built environments (cited in Javan Forouzandeh & Matlabi, 2011). In other words, place has two dimensions of material and immaterial, which evokes feelings, emotions, and desires in its inhabitants. Due to these feelings, a kind of belonging to a place is created that leads to the formation of spatial identities (Semken & Freeman, 2008). By creating such sense of belonging, spatial identities cause understanding of the surrounding environments. Moreover, through facilitating this communication, the fear of lack of knowledge is eliminated (Ghasemi & Negini, 2010).

This is why this feeling is especially important during school time. In the early years of life, the sense of belonging is more related to the concept of home. However, with growth in children in the later stages of childhood, signs of interest in outdoors, nature, and play areas appear (Jack, 2010). Especially through meeting needs such as solidarity, the desire for friendship, and cooperation in school this sense gets reinforced. It also strengthens the motivation in students through more effort, care toward the school environment, relationships, and classmates (Akrami, 2005).

Sense of belonging is associated with many environmental concepts, but because the open learning space plays an important role in the formation of the student's personality, creating a sense of belonging to this environment can have a serious impact on his/her character and identity (National school grounds survey, 2020).

In the meantime, a sensory approach to the environment is introduced by a combination of perception, cognition, and emotion. Increasing sensory richness through using a set of senses in the environment affects the sense of belonging. This environmental feature, by increasing motivation, is able to affect social activity and interactions. It is clear that sensory interaction with the physical and social environments generates a context for the individual to perceive different senses and achieve a stronger sensory perception (Malek, 2012).

Bentley (2003), in his reference to cognitive perceptual factors, asserted that environmental differentiation is created by the sense of belonging to more stable environments. This sense is categorized into consensual and therapeutic belonging. Other physical factors such as recognition of boundaries, ownership, and neighborhoods are influential factors for the proper perception of the environment (Javan Forouzandeh & Matlabi, 2011). Also, the diversity and flexibility of activities and spaces can determine the diversity of functions. Functions also change according to the

importance and demands in the open educational spaces (Malek, 2012).

Providing interests and needs from the surrounding environment determines the specific activities of that environment. Children's interest in group interactions and games impact the growth of their trusts towards each other and their educational institutions. On the other hand, the appropriate shape and size of space have the ability to gather people together and create opportunities for interactions and social relations (Azemati, 2012). As a result, designing an open educational space with appropriate form and function enhances students' trust and participations.

At this level of the sense of belonging, physical environmental factors are divided into two important categories of activity and physical environments. Social factors define public actions, and interactions that cause the environment include the context of social and cultural activities (that individuals collectively perceive of the environment). The physical environment creates the sense of belonging through form variables and the organization of components. Physical elements impact the sense of belonging by creating environmental differentiation and connections between internal and external spaces. Different features of form such as shapes, sizes, textures, and colors are the means of communication with space users. It also helps provide the desired activities and functions (Javan Forouzandeh & Matlabi, 2011).

## Method

### Participants

The study sought to achieve spatial characteristics affecting trust and social interactions in educational outdoor space and the method is exploratory. In the initial step, qualitative research was done to expand the subject and discover related factors. Thus, using the Delphi method, open interviews were conducted with 10 experts as faculty members in the fields of architecture, urban planning and social psychology. The first expert was selected and then interviews with professionals continued to find further information about the problem and related concepts. Snowball sampling method was continued to reach theoretical saturation. KMO test also approved the number of interviewees.

### Instruments

#### Q Factor analysis to extract expert's opinions

A significant point in Q-factor analysis is the categorization of expert opinions. In this kind of analysis responses are not categorized. In fact, extractive factors

include different intellectual inputs of experts on the subject.

Using Q factor analysis, four classifications are obtained. The questionnaire was reasked by experts after formulating and deleting a number of questions. In this way, the accuracy of the research topic and the results of the previous round of the questionnaire are checked.

In each category, questions with the highest and lowest scores (9-10 or 0-1) are extracted. In the next step, common questions are identified among them and are set in a smaller questionnaire to be asked from experts. In the second questionnaire, the classification is done by repeating the previous steps.

The sample size adequacy test needs to be considered prior to any further efforts. The KMO test determines the adequacy of the sample size. If this value is greater than 0.6, which is the case in the present sampling, the sample size is acceptable. In the Bartlett sphericity test, if the Sig of the test is less than 0.5, the factor analysis can be performed.

## Procedure

After selecting the participants and according to expert's opinions and by relying on the grounded theory methodology, the basic concepts and main points were extracted. Using open coding, the concepts were classified and nomination was done on each category. Then, to discover the relationship between the findings, comparing and measuring them, continuums were formed. Then, based on the experiences and knowledge of the researcher, the related concepts were set in a

logical order in various continuums. Also the appropriate name was chosen for each of these continuums.

Finally, considering the new concepts, naming on the whole continuities was done. In this way the main headings were generated to produce concepts which organize the contents in the content table. In this table, goals are the same as the extracted concepts. Factors derived from open and axial coding include; sociable space, recognizable space, environmental and psychological comfort, flexible and diverse spaces for a variety of activities and social trust.

It should be noted that the created Continuum and concepts (with a caption on them) as well as the content table are reviewed by experts for correction and approval. The content table provides the background for designing the questionnaire. To ensure the correct answer of different types of audiences, the questions were asked in three tones of; cognitive, emotional, and behavioral. Questions were asked using the range of 10 Likert options.

## Findings

The percentage of 90.469 that indicates the cumulative variance of the rotated data, indicates that about 90% of the experts' tendencies are the same. In other words, this number refers to an external reality that has been recognized by experts and can be further investigated and identified. But the other 10% of opinions come from personal preferences and specializations.

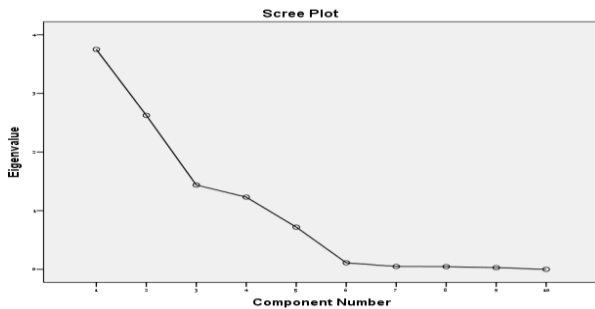
**Table 1.**

*Data variance After Rotation of Factor Analysis*

	Before rotation			After rotation		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
<b>1</b>	3. 751	37. 514	37.514	2. 914	29.142	29. 142
<b>2</b>	2. 626	26. 261	63.776	2. 159	21.587	50. 729
<b>3</b>	1. 438	14. 380	78.156	2. 012	20.123	70. 852
<b>4</b>	1. 231	12. 314	90.469	1. 962	19.617	90. 469

The Scree Value diagram is one of the tools that help identify the factors obtained from experts. According to the diagram, from the fourth factor onwards, the hypothetical line of the diagram tends to break and moves towards stability. The amount of eigenvalues begins to decrease from the fourth factor onward. The

eigenvalues of the first four factors are more than one and therefore they remain in the output.



**Diagram 1.**

Scree Plot to Determine the Factors of Factor Analysis

The first and second factors are meaningful and great. Subsequent factors (third, fourth) are also meaningful and definable. It is possible to identify the desired factors by using the table of rotated data as well as their factor loading table (Table 4). Thus, the factor load greater than  $\pm 0.4$  is classified in the category of that group. As mentioned, in each group, questions with the highest and lowest scores (8-9 or 1-0) were extracted to find a common thinking system among the experts in each category.

Finally, by naming the main factors that are extracted from the questions, the factors affecting the design of open educational spaces are obtained. A team of five experts reviewed the factors again to prepare the ground for the formation of the second content table.

**Table 2.**

Rotated Component Matrix<sup>a</sup>

	1	2	3	4
Var0001	.956			
Var0005	.960			
Var00007	.982			
Var0003		.435		
Var00006		.942		
Var00010		.942		
Var0002			.966	
Var00009			.948	
Var0003				-.499
Var00004				.872
Var0008				.915

The new questionnaire was designed to be asked from the users of the space. Experts identified the factors affecting students' trust and participation in the learning

environment in social and cultural, physical, environmental psychology and design dimensions.

**Table 3.**

Classification of Experts in Second Round of Delphi based on Their Viewpoint

Classification of professionals	No. of professionals
First group	1-5-7
Second group	3-6-10
Third group	2-9
Forth group	4-8

The characteristics and spatial elements in each of these factors are as follows: 1. Using the soft and green (not massive) barriers to increase the view to the environment and its easier recognition; 2. Using enough light to encourage physical activity and using the desired light and shade in order to create environmental comfort and consequently mental comfort; 3. Using multifunctional and multipurpose spaces that have the ability to integrate functions and applications; 4. Paying attention to spaces for group and exhibition activities or a place for presenting outdoor displays; 5. Providing the opportunity to use natural green space and elements; 6. Providing visual comfort; 7. Using porches and verandas in the vicinity of closed space, paying attention to the spaces between open and closed areas and providing conditions to access or use open space from closed public spaces such as; Library, canteen or workshop classes, and 8. Definable spaces. which can be supervised for individual activities and multi-sensory plays.

9. Spaces that offer safety and security, to provide suitable conditions for the active presence of students in order to gain various experiences. 10. Design of spaces or spatial components such as; Furniture with direct activity of students to increase the sense of responsibility, trust and participation 11. Create diverse and supervised spaces for different age groups to acquire capabilities and social skills related to that age. 12. Using flexible and diverse furniture, suitable for sitting and enjoying fine view. Also proper for talking and group activities. 13. Spaces for classes and cognitive learning. 14. Space with the ability to change in order to create attractiveness and flexibility in the space.

**Table 4.**  
*Factors' Definition*

No.	Factors	Factor definition
1	<b>Social dimensions</b>	Relationship between sociability of space with social interactions, functions and learning within open educational spaces as an environment for social activities.
2	<b>Design dimensions</b>	Effect of diversity and flexibility (e.g. multi-functional) on open educational spaces as an environment to promote different functions and activities.
3	<b>Physical environment dimensions</b>	The capacity of space to recognize it easily and its capacity to promote easy movements and increasing participation in collaborative and social activities in open educational spaces.
4	<b>Environmental psychology dimension</b>	The effect of physical and psychological comfort in the presence of people in open educational spaces.

### Aknowledment

The article is adopted from a research on investigating physical characteristics of environment in order to increase trust and social participation in public places (case study of YousefAbad neighborhood) which has been supported by Tehran urban research and planning center.

### Discussion and Conclusion

Research has been formed around formulating the design principles of educational open spaces with respect to student's participation, interaction and trust. According to experts, some social-cultural, physical, design and psychological characteristics of the environment can facilitate the promotion of participation, interaction and trust. Also, Azemati, (2017) in his thesis on open educational spaces in universities consider almost the same categories, influencing open educational spaces.

Clearly, through using specific features and attributes of outdoor educational space, it is possible to enhance children's presence and sense of belonging to the outdoor space as the study by Akrami (2005) which showed that emphasis on active presence of children in schoolyard increases through enhancing sense of belonging to the educational space by different kinds of play.

In this way, the level of various interactions, social and cultural learning grow which result in training participating students. In the meantime, factors such as space diversity and functional variety, the use of multi-functional spaces and flexibility also affect this process. Malek (2012) also concluded that flexibility and diversity as physical attributes that impact children's emotions and aesthetic understanding in open learning spaces.

It should be noted that educational open space, is a social place as well as physical one. In other words, it does not only create a place for environmental and

cognitive learnings as the main function of the school (Shams Dolatabadi, Mozaffar, Malek, & Saleh Sedghpour, 2019) but also it provides a space for all kinds of social interactions, cultural learning and social skill trainings through different senses and active participation.

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