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The Effect of The Quality of Outdoor Space on the Interaction of Students

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ABSTRACT

The health and growth of children have always been affected by social environments; School is the primary social institution where students can gain social and educational skills. It also serves as the main factor in the relationship between the external environment and out-of-home behavior of students. Therefore, the purpose of the present study is to find the hindrances in the interaction of students in educational environments and eradicate them as well as to consider the optimal form of schoolyards with an emphasis on students' group cooperation. Data collection: In this research 73 students from technical schools of Chaharmahal-va-Bakhtiari province were selected. In order to study the suitable places for student interaction, the students were asked to spot the map of the schoolyards. To make sure about the reliability of the results and study the quality of these spaces, students were interviewed and talked with. The results of the study revealed that students prefer nature to vaster spaces without sceneries. The location of the yard also has a determining role in the interaction of the students.

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INTRODUCTION

Today the idea restricting educational space only to internal spaces of the buildings is rejected and it is believed that educational space includes all indoor and outdoor spaces and all elements related to the space of school. One of the most important features in planning schools is the quality of space as closed or open with yard and their skeletal discipline (Kamelnia, 2007). From the definition of "yard" in contemporary buildings it is inferred that yard is the remaining space of a land after the construction of a building is over which in its most optimal condition is covered with a thick layer of asphalt. Based on such a definition, open space or yard in contemporary schools lacks attributes such as dynamism, liveliness, flexibility, relaxation, security, etc.

Schools are some small social systems, in which students learn cognitive skills and gain information in addition to ethical principles, social customs, viewpoints, and ways of interacting with other people (Mozafar, 2009).

Since the open space of school is reflected as a fundamental element beside the closed space in educating students, consciously planning it can create a relaxing space in break time. In addition, it can have an effective role in creating a proper environment for doing group works, learning social skills, and increasing self-confidence (Shahzadeh, 2007).

According to the international treaty, article 15- children's freedom in forming groups:

Children have the right to communicate with each other and form groups (International Child Treaty-International Food Organization Catalog(UNICEF)).

A child learns how to organize their adulthood life by communicating with peer children. Being with peer groups lets them experience equal relations whereas in dealing with adults they only have to be obedient (Vanderzende, 2005).

In early childhood, communicating with peer children can partly guarantee the healthy growth of children and according to studies, children tend to increase their social interactions as they get older. Regarding the third level of Mazlo's pyramid on human needs, human beings need a sense of belonging and acceptance. This sense can be created by large groups such as sports clubs, offices, religious groups, professional organizations, etc. or small social groups such as family members, a spouse, a close friend, a teacher, a co-worker, a classmate, other reliable people, etc. People also need to be loved by others and love them (either the same sex or a different sex)

and this experience can help decrease the probable harmful effects of stressful events (Vanderzende, 2005). Lack of such an acceptance will lead to personal solitude, social stress or depression (Mazlo, 1943).

Any one in any stage of growth is interested in a close relation with others. A person tends to be socially recognized, be respected by the group, and at the same time be considered as a group member (Mohamad, 1992).

Children start school at the age of 6 and when they leave it as adults, they have gained a lot of different experiences: dealing with older people, playing with other children, group work, success and failure, and conflicts with classmates and teachers; therefore it is expected that school has a strong effect on mental health of the students (Ganji, 1998). One of the features of mental health is the ability to communicate with others. A basic need of a healthy person is the tendency to have humanly relationships with other people including friends, co-workers, relatives, etc. Among the basic needs of a healthy person are sense of belonging to others and vice versa and a sense of possession (Sanayi, 1984). Choosing solitude and isolation are a form of defending mechanisms used by people who suffer from contradiction and those who evade others for no good reason, are mentally ill (Mirkamali, 1984). Rogers on the other hand, emphasized the safe relationship and believed that unhealthy people can be cured by relation therapy.

Children can express their identities and show their personal values to others better if they are in more dynamic and informal environments. Creating opportunities for self-expression and discovering natural capabilities, can increase self-confidence and self-esteem and consequently result in the growth of their competence and practicality.

If students are in environments which do not match their mental needs, they will get dissatisfied with them and a decrease in the motivation, interest and social function of the students will be the result (Harrison and Binnes, 1993). Playing in natural environments can help the cognitive and physical growth of children and spread their active social and cooperative behaviors (Sageie and Fiortoft, 2000).

Open, connecting, and middling spaces are one of the principles of any architectural plan. Because of having "anonymous" and fluid function, these spaces are mostly neglected and even in physical planning, they are not paid enough attention; so forcing different designers to follow the same physical program can lead only to similarity in the quality of the plans not necessarily in form and skeleton of the plans. Indoor classrooms as a developing model in the architecture of schools and a general former of them are of great importance, although what has been neglected in the modern architecture of schools, is the basic fact that students do not learn only in classrooms, but a great deal of their experience and understanding of social life occurs in open and half-open spaces of schools especially schoolyards. Schoolyard is a self-sufficient and dynamic urban space where a small-scale social life happens and it can be said that school is a small model of future society.

The quality of activities done in outdoor spaces of schools depends on two basic factors: one is cultural factor and the other one is environmental factor (skeletal-spatial). Although the degree of the effect of these two factors on the happening of these activities or in better terms, behavioral models is not the same. Looking at others, listening to them and speaking are all activities that determine the quality of a space. The existence of proper spaces along with optimal facilities has an important role in forming such activities. These spaces reinforce social contacts of the students and meet their mental needs.

The following activities occur in outdoor spaces of schools:

1. Essential and important activities which occur in all conditions and are not related to unique social features. This group includes all essential activities such as participating in opening ceremony of school, drinking water, and using restrooms in break times.
2. Selective activities which include activities done in the schoolyard based on students' favorite conditions. Among these activities are: talking with friends, hiking, taking breath, sitting in the schoolyard, watching something, playing, and having fun.
3. Social activities which happen in the schoolyard and depending on the attributes of the space of yard encompass a wide range of reciprocal activities of students. Since these activities are affected by other social and spatial activities, they are also called final activities. Examples of these activities are greetings, discussions, and group activities and games. On the other hand, the amount and quality of the activities done in outdoor spaces are extremely influenced by physical programs. Selective activities and a great deal of social activities will not occur if the environmental conditions are not suitable and if the conditions are suitable, they will develop. Regarding the previous studies, when there is a progress in the functional-spatial features of the environment and the use of different suitable colors in vertical and horizontal surfaces, people are more attracted to outdoor spaces. Research shows that there is a direct relationship between students' traffic in outdoor spaces and the amount of their social activities (The organization for reconstructing and equipping schools, 2005).

Despite adults who use words for expressing themselves, children make use of other tools like games to express their problems. Games are voluntarily chosen activities that a child tends to do (Robin and Fine and Wendenberg, 1983). Games are full of joy for the children where they can behave as they wish (Hags, 1995). Hence, since games are adaptive to unique needs and conditions of children, they provide them with a wide capacity of expression. Therefore, schoolyards where children spend most of their time, should be designed based on the children's needs for playing so that children can get familiar with models of life, gain a true

understanding of themselves and the physical world, and improve their ability in increasing communication with peers (Ozdemir and Oguz, 2008). According to Partan's studies, children's games are classified into six categories: 1. Reactional games 2. Individual games 3. Observation 4. Parallel games 5. Partnership games 6. Cooperative games (Vanderzende, 2005)

Human perception of the environment is affected by two factors of social environment and physical environment (Schultz). There is a relationship between perceptions of students in school and their behavior and satisfaction with the school environment.

Lucas believes that developing schoolyards needs to be holistic, stable and cooperative. As a main theoretician of hidden and informal curriculums in open yards of schools, SK Timtan emphasized the necessity of designing curriculum for open yard to develop hidden and informal curriculums such as educating by nature and teaching team work (Timtan, 1994).

Studies by Kow and his colleagues in 2004 revealed that having green space is a way of creating informal and happy communications and flora has an effective role in perception and behavior of children and adolescents especially in forming stronger social relationships and links (Hoseini, 2007). Natural and outdoor spaces in schools have a crucial role in creating and developing social relationships of children. Such spaces facilitate the sense of social relationships of children by creating different opportunities of interaction for them. Empirical studies reveal that artificial environments of children should combine with outer spaces especially green ones to create physical conditions which cause positive behavioral feedbacks such as place dependence and identity (Fjortoft, 1998). Since the school environment should have appropriate natural elements for the students to gain experience with nature, lack of suitable landscapes in outdoor and combined spaces of schools can be a main reason for disconnecting children from nature (Herrington and Studtmann, 1998). So attempts done for changing the present schools with asphalt yards to biological gardens can help promote more active and friendly behaviors in the field of natural environment (Moore and Wong, 1997). Many capabilities for social relationships in adulthood have roots in schools. Therefore it is necessary to create a space in schools which is suitable for interaction, making friends, and co- thinking of children. This goal is achievable by properly designing the outdoor spaces of schools and stressing the use of green spaces which can meet such needs and at the same time pave the way for appearance of social talents and cooperation of students in group works. Different types of such spaces can be organized for the assemblage of small, medium and large groups.

Micro scale: The space designed in this scale allocates a limited space to a finite number of individuals (users) or small groups. Examples of these spaces are those green ones located between classrooms or small porches connected to them.

Medium scale: such a space is used for assemblage of medium groups of users and harmonizing a number of closed spaces. Examples of these spaces are central yards of schools surrounded by closed spaces.

Macro scale: Regarding the potentials of the site, spaces designed in this scale can be used for different purposes such as having a wider view of nature of people, assemblage of larger groups of users, and creating glory for the group. If the relationship between the closed space and the green one in macro scale be formed without the intervening of another space, the contrast between the classroom environment and the outdoor space will be the most important criterion.

Combined scale: If two or three of the above scales are used in designing a green space, the final space will have a combined scale. In many cases, combined scale is the most appropriate choice in designing the green space. In this way, not only will the designed green space have a spatial variety but also it will meet various needs (Shahzadeh & Vakilinejad, 2005).

Methodology:

Stage One:

As mentioned before, this research was a survey done in technical and professional centers of Chaharmahal-va-Bakhtiari province and included a variety of open spaces such as the open space facing the classrooms and spaces near them located in the southern part of the building, the open space facing the classrooms far from them, the open space between official buildings, the small-scale open space around the site, the open space around the official building, the small-scale open space between classrooms located in the northern part of the building, the open space surrounding the restaurant, the playground, the small-scale open spaces between the workshops, the open spaces around the workshops, the roadway, and the spaces near the boulevard. One class among the first grades and one class among the second grades studying mechanics along with one first grade class and one second grade class studying electronics were randomly selected. After that they were given the provided map of the schoolyard with the open spaces numbered on that. Based on the open spaces, a table was designed and given to students to prioritize their gathering places on that from one to twelve in which number one presented the most populated and qualified spaces and number twelve presented the least populated and qualified places. The total sample population was 90 people the return rate of correct questionnaires of which was around 73 people which approved the reliability of sampling.

Then regarding the statistics from the tables, the percentage of students who had selected the first row in column A was obtained. After that the percentages for other rows to number 12 were calculated and the same was done about column B and accordingly a statistical diagram was created for comparison. Finally the percentages of students who had selected their so-called positive or negative spaces from A to L, respectively, were clarified separately.

Stage Two:

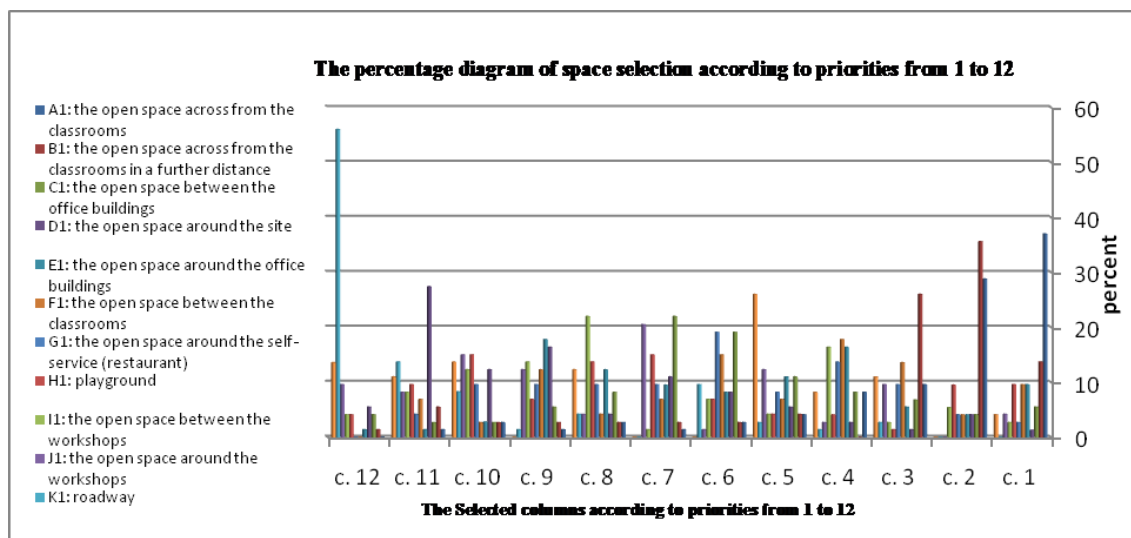
Having obtained the results of tables and statistical diagrams, some observations were made on different days of the week from the most populated and less populated spaces and also some photos were taken from those places to approve and generalize the results to the whole sample population (the whole school of art). The results of the observations were the same as the comparative results of the table and statistical diagram which means that in fact, students tend to gather in more interactive spaces where they do their group works and have their discussions in the break time.

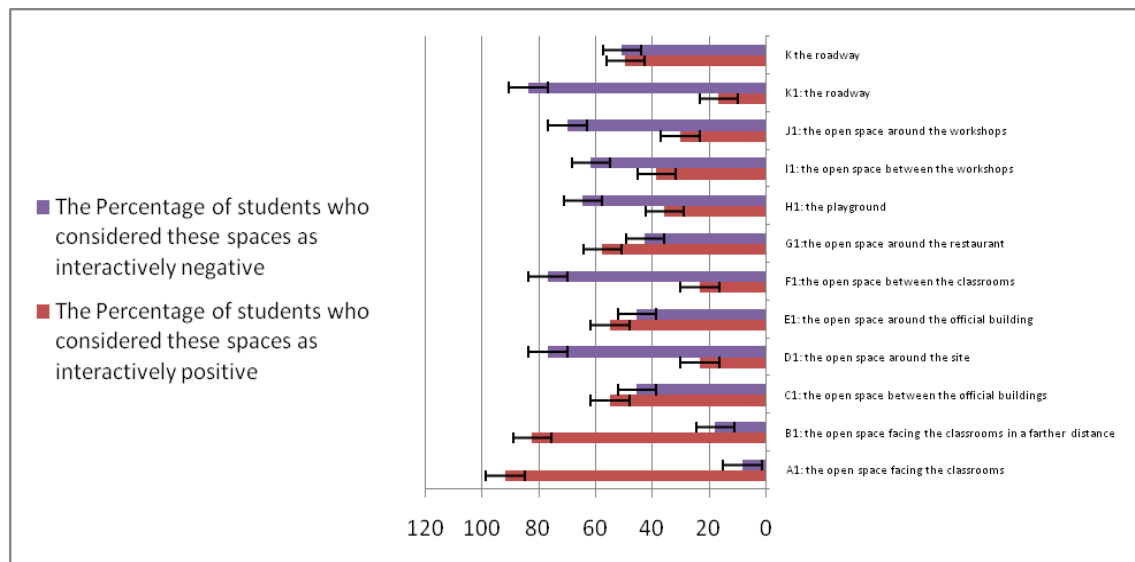
Stage Three:

Students and teachers were interviewed on the reason of gathering in such open spaces. They were also questioned about the high or low quality of the most populated spaces and. In addition, the positive and negative points were recorded.

Discussion:

According to the results, students chose the spaces facing the classrooms in columns 1 to 6 (the first priorities). And then the farther spaces facing the classrooms and the spaces between classrooms were selected, respectively. The spaces around the restaurant and the open space between the official building and around it were chosen in the same way. The other priorities were spaces beside the boulevards, the spaces between the workshops, the playground, the open spaces around the workshops, the open space around the site, and the roadway, respectively.





12	11	10	9	8	7	6	5	4	3	2	1	space
0	1.4	2.7	1.4	2.7	1.4	2.7	4.1	8.2	9.6	28.8	37	A1: the open space across from the classrooms
1.4	5.5	2.7	2.7	2.7	2.7	2.7	4.2	0	26	35.6	13.7	B1: the open space across from the classrooms in a farther distance
4.1	2.7	2.7	5.5	8.2	22	19.1	11	8.2	6.8	4.1	5.5	C1: the open space between the office buildings
5.5	27.4	12.3	16.4	4.2	11	8.2	5.5	2.7	1.4	4.1	1.3	D1: the open space around the site
1.4	1.4	2.8	17.8	12.3	9.5	8.2	11	16.4	5.5	4.1	9.6	E1: the open space around the office buildings
0	6.9	2.7	12.3	4.2	6.9	15	6.9	17.8	13.6	4.1	9.6	F1: the open space between the classrooms
0	4.2	9.6	9.6	9.6	9.6	19.1	8.2	13.7	9.6	4.1	2.7	G1: the open space around the self-service (restaurant)
4.1	9.6	15	6.9	13.7	15	6.9	4.2	4.1	1.4	9.5	9.6	H1: playground
4.1	8.2	12.3	13.7	22	1.4	6.9	4.2	16.4	2.7	5.4	2.7	I1: the open space between the workshops
9.6	8.2	15	12.3	4.2	20.5	1.4	12.3	2.7	9.6	0	4.2	J1: the open space around the workshops
56	13.7	8.3	1.4	4.2	0	9.6	2.7	1.4	2.7	0	0	K1: roadway
13.6	11	13.7	0	12.3	0	0	26	8.2	11	0	4.1	L1: beside boulevard

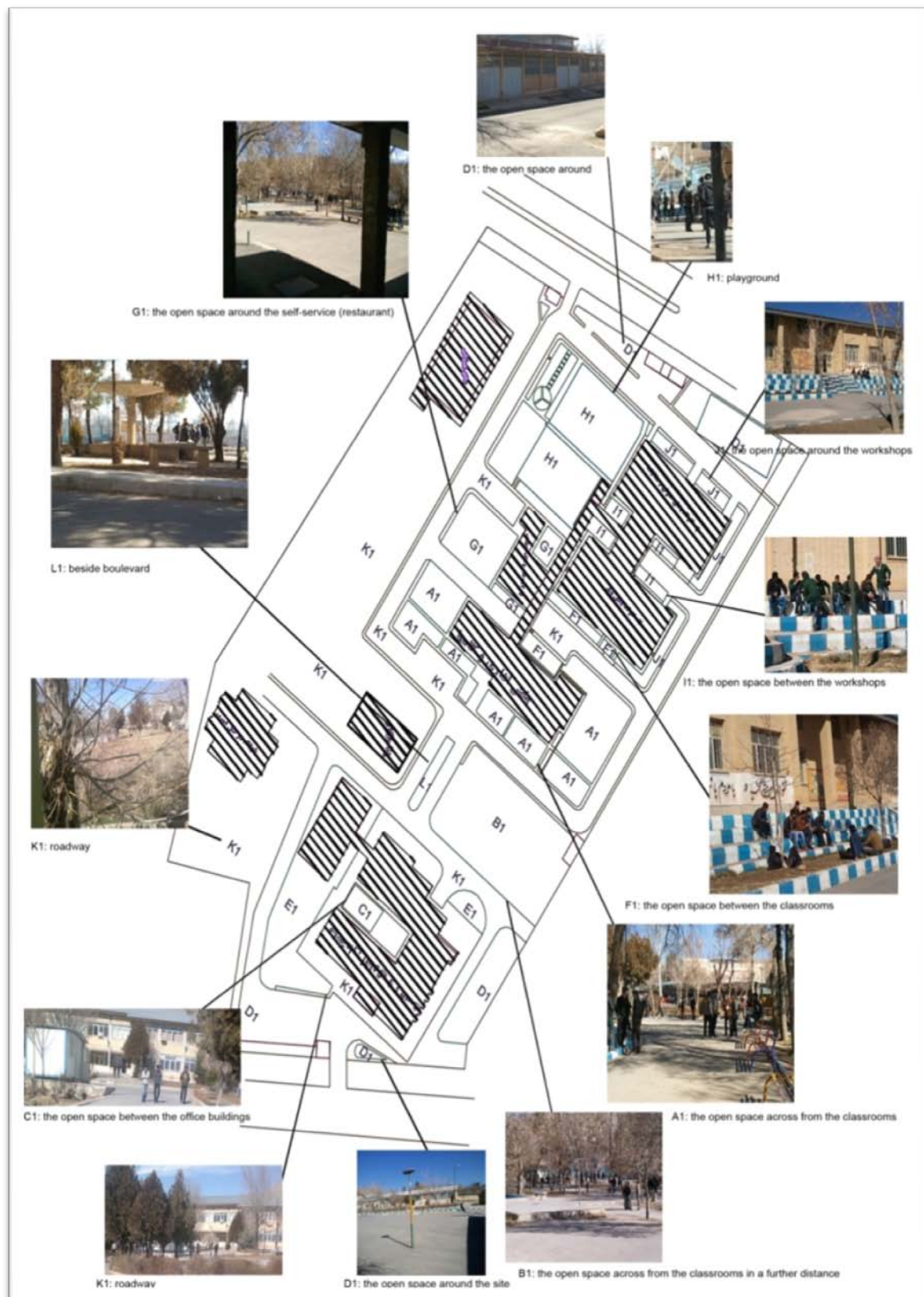
The box plot diagram mean+ _ standard deviation, The Percentage of students who considered these spaces as interactively negative or positive

Spaces	The Percentage of students who considered these spaces as interactively negative(based on the box plot diagram)	The Percentage of students who considered these spaces as interactively positive (based on the box plot diagram)	The positive and negative factors affecting the interaction of students based on their interviews
A1: the open space facing the classrooms	8.22	91.78	Being located in the southern part, getting enough light, having a good view, and being near the official classrooms are the positive points. The negative points are lack of enough benches and chairs.
B1: the open space facing the classrooms in a farther distance	17.81	82.19	Being located in the southern part and being warm enough in winter, getting enough light, having a good view and tall trees with shadows and great size so that students can observe the activities of other students, are positive points. Negative

			points include lack of a good construction of the complex and being far from the classrooms.
C1: the open space between the official buildings	45.21	54.79	Being near to teachers in the official section is the positive point. Lack of suitable space creation, and resting facilities such as benches and chairs as well as the steady grass (without tall trees and shadows) are amongst the negative points.
D1: the open space around the site	79.71	23.29	Lacks of functionality of small spaces, insecurity, and lack of supervision of authorities on such spaces, are the negative points.
E1: the open space around the official building	45.21	54.79	Being near to teachers in the official section is the positive point. Lack of suitable space creation, and resting facilities such as benches and chairs as well as the steady grass (without tall trees and shadows) are amongst the negative points.
F1: the open space between the classrooms	32.88	67.12	Accessibility to teachers is the positive point while being cramped, lack of a good view and green space, are the negative points.
G1: the open space around the restaurant	42.47	57.53	Eating together is the positive point and lack of suitable space creation is the negative point.
H1: the playground	64.38	35.62	Sports activities are the positive point and being far from the main entrance the flat asphalt are the negative points.
I1: the open space between the workshops	61.65	38.35	Easy access to workshops and using these places for workshop activities are the positive points. Being small and lack of suitable view are the negative points.
J1: the open space around the workshops	69.86	30.14	Access to teachers is the positive point but being small is the negative point of that.
K1: the roadway	83.57	16.43	The negative points are the feeling of temporariness, lack of designed pausing places, existence of dust, dirt and pollution.
L1: beside the boulevard	50.68	49.32	Green space is the positive point but the negative point is lack of pausing places.

The analytical table of results based on the obtained percentages

To confirm the results of questionnaires, we went to these places recorded our evidences by taking photos on different days which confirmed the correctness of the data.



Map of the field along with the taken photos from students while interacting in such places

Then students who had gathered in these places were questioned about the quality of these places most of the positive or negative comments of whom were recorded as follows: most students selected the green spaces facing the official classrooms and when asked about the reason, they said that being located in the southern part, getting enough light, having a good view, and being near the official classrooms are the positive points while the lack of enough chairs and benches, is the negative point.

The positive points of farther spaces from official classrooms were, being located in the southern part, being warmer in winter, having a suitable view with tall mountains with shadows, and a big size so that students can observe the activities of other students. Lack of field-making in the whole complex and being far from the classrooms were the negative points.

When students were asked about the positive points of the open space between the classrooms, easy access to teachers was mentioned. Although lack of enough space was considered as the negative point. This space lacks a proper landscape and sufficient green spaces since not so good plants grow in its northern part.

Students who were around the restaurant gathered there mostly for eating and didn't spend a lot of time there since they believed that lack of a good space creation is the undesirable factor about it.

The percentage of selecting the space between the official buildings and the space around the official building by students was the same. When asked about the reason of interaction in such places, they said that the reason is being near to teachers in the official section is the positive point while lack of suitable space-creation and resting facilities such as chairs and benches and the flat grass (lack of tall trees with shadows) were the negative points.

Although the spaces between the workshops didn't have facilities, because of having accessibility to workshops and using such spaces for workshop activities, students used them for learning workshop activities. Of course, regarding the small size of the spaces between the workshops, not having a good view, and not being useful for learning, children considered them as being improper.

Students didn't consider playgrounds as suitable because of being far from the main entrance and the flat surface of the asphalt and they gathered in playgrounds only in certain hours allocated to physical training. Hot asphalt in the second half of the year and its freezing condition in the first half of the year are the main problems of students with these places.

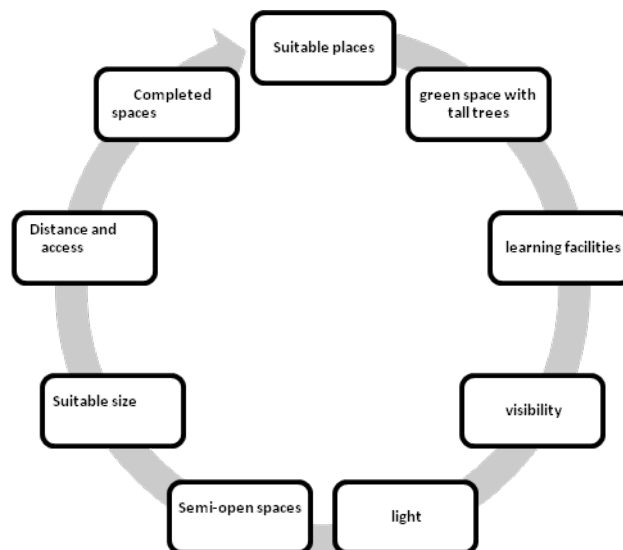
Students didn't consider the spaces between the roadways as suitable since they didn't have appropriate pausing places, though they confessed that by space creation and putting benches and chairs, these places could turn into suitable ones.

Students were dissatisfied with the lack of functionality small open spaces around the site and many of them claimed that such places are popular with wicked and dangerous children. They believed that lack of supervision of the authorities on such spaces and remoteness of them from the whole complex has made them insecure. They also believed that if these small spaces or so-called backyards are turned into bigger yards in front of the building, they will have a better functionality on will be under more supervision.

Students also believed that dusty roadways were not suitable places for their interactions since they regarded them as incomplete spaces which give people a sense of being temporary. Moreover, these dusty roadways did nothing but creating dust, dirt and pollution. After these interviews we went to teachers and authorities of the art school to know their viewpoints about the quality of the open spaces of schools regarding their job experience in different schools. They consensually believed that the classrooms don't have enough space for the learning of students and expressed that students must be in open spaces to learn by interacting. They thought that classes are teacher-centered and boring in which students cannot get any scientific experiences.

Teachers were dissatisfied with the waste of open spaces and existence of deserted spaces around the complex. They also believed that the playgrounds were insufficient and without plan. They emphasized the necessity of semi-open spaces in the total spaces of the complex to have access to both open and closed spaces in a climate such as Shahre-e- Kord's which has severe and freezing winters.

Teachers supported the idea that there must be supervision over open spaces by both teachers and students



Factors affecting the interaction of students on open spaces based on the obtained results

Conclusion:

1. The results revealed that in prioritizing the quality of outdoor spaces, students prefer green spaces across from the classrooms to spaces across from the workshops, because they spend most of their time in classrooms and these spaces seem to be more suitable regarding their access to classrooms in students' short break times.

2. Students prefer the open spaces across from the classrooms in southern side of the building to the open spaces in the northern part of the building since they are exposed to sunshine, are warmer in winter, and it is less possible for the students to slip-on ice in winter in the mountainous climate of this province.
3. Students prefer defined spaces such as those with benches, desks and bowers to undefined spaces such as asphalt and roadways.
4. In students' eyes, larger and opener yards in the southern side of the school are more suitable than smaller yards located in the eastern and western sites since they have better landscapes and students get to watch other students' activities.
5. In their idea, small yards between classrooms and workshops are not suitable since they lack landscapes as a result of being small.
6. Students prefer sites with tall trees to lands covered only with grass because of the shadow and gather in such places more.
7. They believed that larger asphalt playgrounds were not as suitable as smaller green spaces for their interactions.
8. Students thought that remote small greenspaces far from the site were not appropriate places for their interactions and some of them had never stepped in such places since they considered these places as frightening or they were afraid of being punished by the authorities.

Suggestions:

1. Creating defined yards with tall trees planted with definite distances in southern side of the building.
2. Using green rolls in playgrounds instead of steady asphalt.
3. Following priorities of accessibility in designing the yard such as quick access to formal classes, etc.
4. Designing the yard and the building simultaneously and avoiding the method in which first building is constructed and then the rest of the land is allocated to the yard.
5. Paying enough attention to the suitable light and landscapes while designing the yards.
6. Using plants which have the capability of growing in northern side of the building.
7. Using remote sites for new functions, for example a research farm.

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