The Impact of Nature,The Teaching And Learning Of Elementary Lessons IN Students 9-11 Years Old
(Case Study: Shiraz Elementary Schools)

Abstract

In today's world some changes have been occurred in human lifestyle, these changes, along with the advantages, have led to a series of disadvantages including their disconnection with the nature. One of the most important areas to re-establish the relationship is the school. The presence of nature at schools, and holding some classes in nature, in addition to meeting the special needs of children causes their separation from those small and boring classes as well as their interest in courses . This study aimed to investigate the role of nature in children's learning. For this purpose, third, fourth and fifth grade classes of 3 schools were held outside the school environment and in the nature in 5 courses. The study is a combinational research and field, indirect observation and library data collection methods were applied, where in the indirect observation, two types of questionnaires were prepared related to the students and teachers and were randomly distributed among 580 students and 50 elementary school teachers. Test reliability was assessed using Cronbach's alpha and it was obtained to be 0.890. The results of this study indicate that the physical place as one of the factors in children's learning has the maximum impact on teaching and learning of children. At the end of the study and by investigating the existing factors in the environment we understood that the expansion of the nature and natural light of it causes the students' interest in lessons in nature.

Keywords: expansion of space, nature, physical environment of the class, schools, interest in lessons

1-Introduction

Changes in lifestyle and technological advances in the cities, especially in large cities have changed human life. Nowadays the advances caused humans prefer landscaped and nature built environment (Van den Berg, Hartig & Staats, 2007).This reflects the separation of the human from the real nature while his strong need to it where the children have less daily experiences among these people. (Mozaffar, et al., 2009: 44)

Studies concentrating on children find that environments predominated by natural features are valued most (Elsley, 2004; Korpela, 2002; Loukaitou-Sideris, 2003) Furthermore, outdoor public spaces providing trees and vegetation are used more frequently by adults and adolescents than are spaces without those features(Coley, Kuo, & Sullivan,1997). Findings on humans' general preference for nature and greenery imply that exposure to green environments has beneficial effects on humans' restoration,well-being, and health (Wells & Evans, 2003), given that the potential of environments

probably depends on people liking the environment .(Christina Kelz& Gary William &Evans,Kathrin Röderer ,2013).With regard to the above materials, we can say that nature has an important role in human life, especially children, who have been disconnected from the nature in todays' world and this connection is necessary to be re-established. Schools are one of the important areas where children spend many hours of their daily life at important ages of modelling, educability and learning and one of the places to re-establish this relationship.Based on the results of a Scottish study about the training program, learning is a chaotic matter for children and hardly put a simple issue in the way of a pre-determined result. And it seems that they understand the world through linking a part of their information to other parts and comparing them with each other and become dependent on events which are felt through rational, physical, emotional, aesthetic and spiritual ways. (School Curriculum & Assessment Authority SCAA, 1996).One of the most important factors affecting children's learning is the environment. Learning environment is a cultural, social and physical context where learning takes place. Understand how a learning environment becomes effective, is necessary to design an architectural environment. Effective learning environment is an environment which along with the other effective factors in children's education such as curriculum, teachers and …has an important impact on education. Although the physical environment of the school is only one of the factors affecting learning; but we can say that it is considered as the most important component in an active learning environment (De Gregori A, 2007).

This study focuses on the importance of the nature on children's learning in schools. The study of educational theories indicates the children's educators' interest in the education out of the classroom environment along with the education inside the classroom and the nature as a learning tool has been focused. The nature has a great deal of potential to improve skills in children and can be a proper substrate to foster various aspects of child development and learning. The existence of natural places also leads to spiritual relief, freshness and the sense of belonging to the school environment.

The main hypothesis of this study is the presence of nature and natural places, as one of the major factors influencing the growth of knowledge, and children are learning.The subgroups of this hypothesis include the following items:

1. The natural places have a lot of abilities in educating children and the proper design of natural places at schools can improve a part of children's education.
2. The proper designing of natural places at schools could be effective on children's feelings regarding the school environment and their sense of belonging to the school environment.

1-2- Research method

The main areas of research include the design of educational spaces, and child psychologist. The design of appropriate learning environments and courses in nature are the main purpose of this study. the method of this research study is not in the usual way as the way children perceive and express is different of the adults' understanding, perception and expression , because personality and age characteristics of children caused the use of practices such as test-image (painting) to express their favourite class and school. The use of this type of test is because the children create well mental picture in their favourite spaces, and it increases their learning. Barraza, in relation to children writing from observations surroundings, states that "Children schemes are a powerful tool in providing useful information for evaluating the observations of the surrounding environment ". Research method is that math and science classes have been held outside of the school environment, 580 students (as the toughest courses) in 3 chosen schools and each school individually had 6 classes in 5 courses outside the school and in nature. Children reactions and learning in the natural environment and the typical classroom environment have been observed and recorded. And then the students were asked to draw their interesting and effective learning class they have ever had during their education according to their experiments. All plans and drawings received in time and stretched and obtained in the class under supervision of the teacher. Official approval to participate in this research and to use the images has been issued by the school principal and parents. And no other information than the children school year was collected about their background. Then questionnaires completed by 50 teachers and 580 students (280 boys and 300 girls) according to learn and holding classes in nature and the data analysed by using statistical methods and SPSS 20 software.

1-3- Review of the literature

The importance of educational environments to improve the quality of learning and teaching is obvious nowadays. Many researchers have investigated the importance of designing the educational environment on children's learning in recent years.Researchers such as Tanner also emphasize the need of outdoor places including green areas and its positive effect on learning. (Tanner CK, 2007, pp. 309-330) Recently, school architects and planners have focused on the importance of involving users (children) in the designing process. Bjorklid writes Piaget believes that: "Children should be able to conduct an experiment and a research themselves and gain experience that these issues will be effective in children's learning" (Bjorklid, P.; 2003) This caused the use of innovative approaches in children's education at times. This issue was first developed by one of the educational activists such as Lawrence Sarmin in America, which was developed through combining Steiner's educational model in many parts of the world. Many educators in America have defended the need to abandon traditional practices not only in education, but also in the design of educational facilities. (Derek Bland, Vinathe Sharma-Brymer, 2012)

2-Theoretical Fundamentals

2-1-Nature impact on children

Many children in urban environments do not have accessto nature. Many parents prohibit their children from exploring wild natural areas because parents and children have little familiarity with nature, parents have concerns about children's safety, and children experience academic pressures and other demands on their time (Louv, 2005). This reduced contact with nature may influence children's development. Empirical research has demonstrated that experiences with nature have a positive influence on children.Davis, Rea, and Waite (2006) suggested that spending time outdoors may help children develop positive values about nature, whereas Wells (2000) suggested that children whose home environments improved the most with regard to greenness after relocation were more likely to have higher levels of cognitive functioning after relocation. Wells and Evans (2003) indicated that natural environments can increase children's psychological well-being. Children whose homes had more nearby nature coped better with life stress than those whose homes lacked nearby natural areas.(Judith Chen-Hsuan Cheng , Martha C. Monroe,2012)

3- Examining the methods used in the research

As described above, two methods have been used in this study in order to obtain more favourable results.First Method:

1- Children's illustration from their own desired and favourite class they had during their course of study.Second Method:

2- distributing a questionnaire among 50 teachers and 580 students, and then analysing it.

3-1- The first method

Participants

Students at grades 3, 4 and 5 (9-10-11 years) in 3 elementary schools (near the park) in Shiraz were studied. The selected age group was recognized as appropriate for the study, because the studies indicate that the symbolic representation usually occurs during the last period of childhood and is distinguished from "knowledge, insight and ingenuity". Also at the age of 7-9 years, "Children have a raphical language that contains special symbols and the three-dimensional understanding (three-dimensional organization) and at the age of 9-11 they attempt to be more precise.

3-2- The analysis of the data

Analysing the mental images of children

There were wide variations in the participants' artistic abilities, but this was not a concern about children's analysis because by observing their behaviour and talking to them about the content of the image, enough descriptions and information were collected. Each design and the interview along with it was encoded by the content in order to determine the common characteristics among the 100 received samples and obtain a through this process. Keywords explored in these images are: place, the school and the desired class, environmental considerations and any special feature including the green area and gardens.

3-4- Interpreting students' designs with regard to their talk

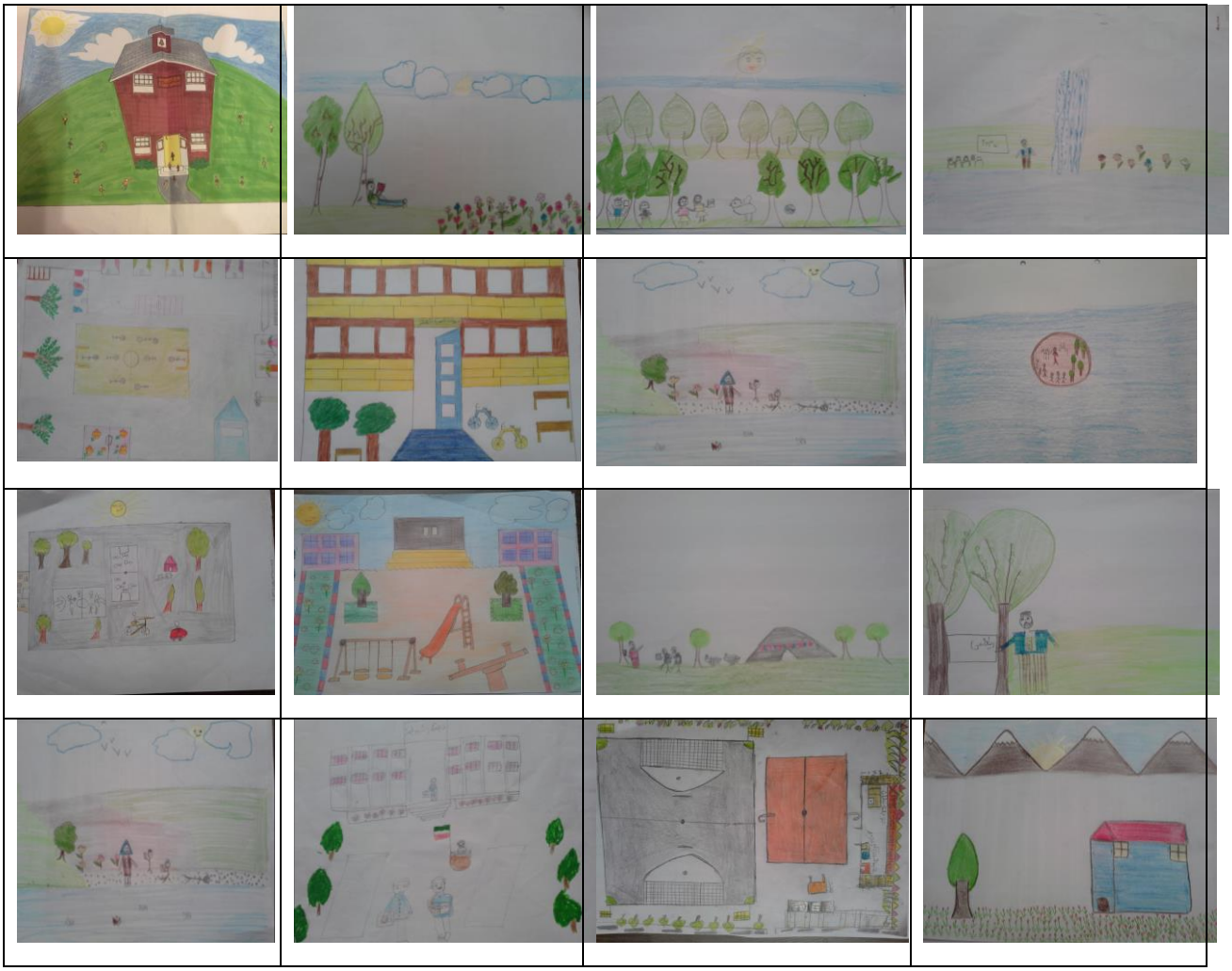
Designing the main instrument for children to express their ideas of the best classes they have had in their entire education; talking with the children, along with their drawings provided important information about what they had drawn, which helped a lot to understand and analyze the figurative data. A problem in the figurative content analysis was the interpretation of the contents on the position of the viewer that his history, social and cultural relationships may vary with the artist (student) that this could cause incorrect assumptions and misperceptions. It has been tried not have such an interpretation.

Interpreting students' designs reveals that they want studying to be mostly fun and in a place that is environment friendly. Their imaginations are involved in colorful and exciting places; and also insist on where they can learn something and be in contact with real life.

For example: I think of a happy and colorful school where students enjoy attending the class (male, grade 5). It would be nice if the class is full of colorful flowers (like rainbow) that cause happiness in everyone (male, grade 3). More than 83 percent of students were considering these features in open and natural places. It is clear that students do not like boring classes. Boringness in their schools would eliminate or reduce the interest for learning. The children also preferred to have schools with trees, grass, water and outdoor garden instead of brown, dark and dusty classrooms.

These results are consistent with findings of similar researches (Birkett, 2011; Burke & Grosvenor, 2003; Doherty, 2005; Pointon, 2000) about children who experience their need to space, light and colour in the open space. The key features of an ideal and effective classroom learning of the children include:Playground with framework for climbing, tree houses for classes in the quiet space with water sound, musical sound of nature instead of bells, colourful place for painting, reading and outdoor games, greenhouses for growing fruit and vegetables for consumption and selling them to make money, creative environment full of colourful flowers and large green spaces, oxygen-rich atmosphere . These listed issues are parallel with different climatic conditions of Shiraz. According to the students' experience of the class as well as natural environment, they imagine their favourite learning environment in outdoors which is active and full of trees and relaxing. This reflects the desire for children to learn outside of the boring and frustrating classroom. This has been promoted in other countries by educational fans such as the Experiential Learning Centre of John Dewey in America, Neil summer hill school in England, Ivan Illich's de schooling movement (anti School Ivan Illich's movement).

Table 1: Children's Illustration of their favourite class during their course of study Source: The authors 2015



3-5-Analysing research topics

a wide range of participants (children) in this study held their favourite class and effective learning outside today's close classroom as well as in environmental in nature with direct and palpable education and portrayed as large, happy, exciting and colourful environments and have stressed holding classes in nature due to having experience in this field as their expectations from their favourite custom class space is limited in nature.

3-6-Procedures 2

Questionnaire data analysis

In this study, two types of questionnaires prepared and distributed between educators and students in four elementary schools, two girls' and two boys' schools and Factors affecting children's learning are investigated in both the questionnaire and the nature of learning, anxiety, fond of children to school, working children. Among students and educators from four schools, 580 students (280 boys and 300 girls) in the third, fourth and fifth grade and 50 teachers (25 in the girls 'schools and 25 in the boys' school) have been randomly selected as the study population. The following table shows the number and percentage of students' gender in the chosen levels.

Table 2: Number and percentage of participants Source: The authors 2015

Educational level	Gender	Number of classes	Number of students	Percent
grade 3	girls	6	120	20.68
	Boys	6	120	20.68
	Total	12	240	41.36
grade 4	girls	3	60	10.34
	Boys	4	80	13.79
	Total	7	140	24.13
grade 5	girls	6	120	20.68
	Boys	4	80	13.79
	Total	10	200	34.47

Schools that have been selected as the sample in this study have been allocated a range as nature in their yard (trees and plants). Following table analyses the relationship of children and nature outdoor in their school and information have collected by field observations and interviews with students.

Table 3: children connection with nature with open space in the school Source: The authors 2015

The performance of students in nature	Number	Percent
Use nature to study	313	53.96
The nature of the game	267	46.03

The above table indicates that 53.96% of children use their environment within school yard with trees and flowers and plants to study. Table 3 is to review and study better outcomes for children by segregation and we came to the conclusion that most of the boys (53.57%) use the courtyard of their school with more trees and plants for game and most of the girls (61%) use their school yard with more trees and flowers for their study.

Table 4: children connection with nature in the school open air, differentiated by gender Source: The authors 2015

Gender	The performance of	Number	Percent

	students in nature		
Boys	Use nature to study	130	46.42
	The nature of the game	150	53.57
Girls	Use nature to study	183	61
	The nature of the game	117	39

3-7-analyzing the data related to students in nature

This part of the study demonstrates the average weight (the students use of nature to play and study), Single-sample T-test (a test that the average of a community is distribution based on T and analyses that how much an average of a society is more or less than a fixed amount) shows the relationship of students with outdoor nature, that average amount are 4.1947 and 3.8947 for studying and games, respectively. The results were obtained according to the whole 5-item Likert scale (very high = 5, high = 4, mean = 3, low=2, very low = 1). Number 3 in one-sample T-test was selected as mean for school students' relationship with nature in school open space. The results indicate that the average used of nature by students in the study (4.1947) was higher than this value and this represents a significant impact of the nature on the teaching and learning of students.

Table 5: quantitative table of children connection with nature in the school open air Source: The authors 2015

The performance of students in nature	Number	Mean	Standard deviation
Use nature to study	313	4.1947	.19876
The nature of the game	267	3.8947	.29876

Table 6: Single-sample T-test quantitative table of children connection with nature in the school open air Source: The authors 2015

The performance of students in nature	T	df	SIg	Mean difference	95% confidence interval of the difference
-	-	-	-	-	Lower Upper

Use nature to study	313	4.1947	.19876		.7196 .8726
The nature of the game	267	3.8947	.29876		.5083 .7135

the aim of the study is to examine the role of nature in teaching and learning of children . Questionnaire assessed factors affecting children's learning at school by using analytical model of study. The following tables reflect the opinions expressed by teachers in the questionnaire.

Table 7: Factors Influencing Children learning at school Source: The authors 2015

Row	Factors	Mean	Standard deviation	Total
1	Physical space class	4.1525	.84718	50
2	Children interact and collaborate with each other	4.1356	.81912	50
3	Children's sense of attachment to class	4.0000	.85096	50
4	Anxiety	3.9661	.92785	50
5	Children communicate with teachers	3.7966	.82587	50

According to the table above, we came into the conclusion that physical space and physical classes have the highest effect than other factors with an average of 4.1525. Then the interaction and cooperation of children with each other, a sense of belonging for children to class, anxiety, relationship between children and the secretary are the other factors that affect student learning.

3-8-analyzing questions related to the questionnaire, holding classes in nature in 5 periods

It was concluded by above investigation that physical space of class is effective on children's learning. So keeping in mind the purpose of this study (the role of nature in learning and education), classes in science and mathematics (as the most difficult courses) were held in nature (on 5 second semester of students). We analysed the effect of nature on factors affecting children's learning. According to teachers, an interest in challenging courses among students is more with their presence in nature and outside of the boring and dull classroom. In order to a more favourable result among students, we separated the questionnaire between girls' teachers and boys' teachers and the top result was true among girls and boys, separately.

Table 8: The role of the nature of the factors influencing children's learning Source: The authors 2015

Row	Factors	Mean	Standard deviation	Total
1	Anxiety	4.1000	.86944	50
2	Distractions	3.7831	.85066	50
3	Interest in the lessons	4.2186	.89266	50
4	Cooperation children	4.1317	.81493	50

Table 9: The role of the nature on the factors influencing girls' learning Source: The authors 2015

Row	Factors	Mean	Standard deviation	Total
1	Anxiety	4.0000	1.05045	25
2	Distractions	3.9831	.88066	25
3	Interest in the lessons	4.1186	.87266	25
4	Cooperation children	4.1017	.86493	25

Table10: The role of the nature of the factors influencing boys' learning Source: The authors 2015

Row	Factors	Mean	Standard deviation	Total
1	Anxiety	3.4068	1.05240	25
2	Distractions	3.4576	1.13445	25
3	Interest in the lessons	3.5862	1.02657	25
4	Cooperation children	3.7797	1.14572	25

The survey indicates that the nature has significant relationship with students' interest in teaching and learning. For further proof, single-sample T-test was used in this context and number 3 is selected as the middle of factors affecting children's learning in nature. Calculations show that each of the factors influencing children's learning in nature was higher than this amount.

Table 11: One sample T-test Table for the role of nature in the factors affecting learning in boys and girls Source: The authors 2015

Row	T	Df	SIg	95% confidence interval of the difference
Girls	-	-	-	Upper Lower
1	10.450	25	.000	1.3733 .9318
2	8.442	25	.000	1.1226 .6063
3	6.703	25	.000	1.1532 .7112
4	6.367	25	.001	1.0470 .5462
Boys	-	-	-	Upper Lower
1	10.649	25	.000	1.3733 .9310
2	4.392	25	.000	1.1226 .6063
3	3.227	25	.000	.1532 .71121
4	4.205	25	.001	.5462 .8256

3-9 Statistical analysis, chi-square test

To prove the hypothesis by citing the questionnaires, by using the chi-square test, we should find a significant relationship between the role of nature and children learning concepts and emotions and a sense of peace and belonging towards the school environment. The results of the test between two variables of nature and interest to teach the students shows the correlation coefficient as 0.683 and a significance level of .000. as the significance level is less than 0.05 level, we have enough evidence to reject the null hypothesis and conclude a significant positive relationship between nature and the students' interest in learning and in fact the presence of students in nature makes them to find an interest in challenging courses, followed by increased learning and thus the first hypothesis is accepted. Maximum correlations, based on the role of nature on anxiety, distraction, information exchange and cooperation, were 0.676, 0.657 and 0.528, respectively, with significant levels of 0.000, 0.000 and 0.001. It can be said that the significance level is less than 0.05 as sufficient level, therefore the null hypothesis is rejected, and it can be concluded that there is a positive and significant relationship between nature and anxiety, distraction, exchange of information and children cooperation. And the second hypothesis will be accepted as concerning the effects of nature on a sense of peace and belonging to the school among children.

Table 12: Evaluation of the correlation coefficient and significant level of the impact of the nature on learning factors Source: The authors 2015

Row	Factors	Correlation coefficient	Sig
1	Nature impact on anxiety	.676	.000

2	Nature impact on distraction	528.	.000
3	The effect of the nature of the interest to lessons	.683	.000
4	Nature impact on cooperation children	.657	.001

The following table generally is using a correlation coefficient of 0.772 and a significance level of 0.000 (significance level less than 0.05 level) which shows the relationship and the role of nature in children's learning.

Table 13: Correlation coefficient and significant of the impact of nature on learning Source: The authors 2015

Factors	Correlation coefficient	Sig
Nature impact on learning	.772	.000

When the correlation coefficient is between 0.50 and 1.00, in this case, the correlation is strong. So according to the above tables and the amount of solidarity, a strong correlation between the factors affecting learning with nature can be seen. The table below examines the factors in the environment from the perspective of teachers and students and we conclude that the size and extent of nature is one of the most effective factors in nature.

Table 14: analysing Factors in the environment and effective on school children learning Source: The authors 2015

Row	Factors	Mean	Correlation coefficient	Total
1	Light	3.8644	.99060	50
2	Color	3.9322	.80653	50
3	The materials used in class	4.0000	.85096	50
4	Class size	4.1356	.81912	50

By separating the questionnaires between girls and boys we concluded that boys' school believe the extent of space, as one of the factors in the nature, has the greatest impact of their learning. Girls' schools believe that light, as one of the factors in the nature, is the most effective factor on their learning.

Table 15: analysing the factors in the environment and effective on boy students' learning Source: The authors 2015

Row	Factors	Mean	Correlation coefficient	Total
1	Light	3.4915	1.04011	280
2	Color	3.5593	1.02168	280
3	The materials used in class	3.6271	1.04878	280
4	Class size	3.7119	1.14547	280

Table 16: analysing the factors in the environment and effective on girl students' learning Source: The authors 2015

Row	Factors	Mean	Correlation coefficient	Total
1	Light	3.6102	1.06701	300
2	Color	3.3559	.96065	300
3	The materials used in class	1.25060	3.5254	300
4	Class size	1.04011	3.5085	300

3-10- Research reviews and discussions

According to the obtained results and analysis, it can be concluded that the presence of students in nature increase their interest in studying as one of the factors affecting learning in comparison with other factors (anxiety, distraction, cooperation and information exchange students, student liaison with the players). This can be a very important factor in learning and education. Natural light and space in the class as natural factors will cause students to be interested in challenging courses and their learning, compared to boring and dull and small classes, will increase in nature.

Conclusion

Information obtained in this study lead us to conclude that physical space of class has the greatest impact on children education as one of the factors affecting student learning. So by creating an outdoor classroom we can see tremendous impact of nature as a suitable space for classes as well, because the nature is one of the most important factors in generating interest among students and therefore increases the lessons they are learning. Studies have shown that features found in nature, such as the expansion of space, and natural light enhance the students' learning. Holding classes in nature or creating natural spaces in the class and school, in addition to a positive impact on children's learning, will be able to meet the needs of specific groups of children. These needs include: (1) the needs of educational, social and psychological development 2. Emotional needs and physical growth. Meeting the needs, will change physical environment of class into effective environmental for education of children. In the first group, the natural spaces should be suitable to children's cognitive development with the aim of increasing knowledge and learning. In the second group, the space should be natural for social and physical growth of children. Social spaces are designed in natural environments, offers interaction and communication and a platform for students to deal with each other and creates collective and individual children's playgrounds which cause noticeable social and physical growth. In the third group, the natural spaces are designed in combination with artificial spaces and create visual elegance with the aim of creating a beautiful surroundings to create a sense of belonging for children. By analysing the questionnaires, it can be said that two research hypothesis include: 1. natural spaces has many capabilities for the teaching and learning of children, and proper designing of natural spaces in schools can improve part of children training. 2. The proper design of natural spaces in schools could make children feel a sense of peace and belonging to the school environment which has been approved and indicates that the nature has an important role in teaching and learning of children.

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