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# Investigating the Impact of Schools' Open Space on Learning and Educational Achievement of Elementary Students

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***Abstract***

***Background***

It is obvious that most of informal learnings of social skills and constructive plays occur in school yards and play-fields where children spend much of their non-official time of teaching. This study aimed to investigate the impact of schools' open space on learning and educational achievement of elementary students in Ahvaz, Southwest of Iran.

***Materials and Methods***

At a cross-sectional study, 210 students were selected randomly as sample of study. Data collection tools included Hermance's achievement motivation questionnaire and researcher-constructed questionnaire (observation checklist to examine the physical parameters of learning schools' open space) and interviews with students. Data of study were analyzed in SPSS- 21 software.

***Results***

Results of this study showed that schools' open space has a significant impact on learning and academic achievement of elementary school students in Ahvaz- Iran ($P<0.05$).

***Conclusion***

Due to the impact of environmental factors (including schools' open space) on learning of students, prepare a standard learning environments for students is a serious need.

***Key Words*:** Educational achievement, Learning, Schools, Students.

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## 1- INTRODUCTION

Schools in general sense, are five major component or subsystem, teachers, staff and services, programs, education, peer groups are formed and physical environment. Each of these components interacts with other components and is important to look at any part of such an important factor in development of personality of students (1). The school is a special social space where education, training and personality development of children who are a community's future assets are founded and run by proper training methods, appropriate physical space and favorable psychological environment. Students in the process of socialization require a healthy environment and models so as to increase their performance. Since schools are the first model affecting students' personality, thus physical space of school as one of the important element for learning and education even in social perspective or spatial quality and its impact on students' development, play a major role (2).

Physical factors and health and safety issues and training are the most effective and most fundamental natural growth factor in terms of physical, mental and educational development in students (3, 4). School children spend most of their waking hours at school, mostly in the sitting position (5). Studies have also shown that there is a relationship between academic achievement and mental health (6, 7). Bazzar Chamazkoti in a study entitled role of educational environment on student achievement of elementary school girl Sari city in Iran 2014 (1), Malone et al. in a study entitled Children's Environmental Learning and the Use, Design and Management of Schoolgrounds in Australia in 2003 (8), Barros et al. in a study entitled Children's classroom behavior is better if they have recess in U.S A in 2009 (9), Dyment in a study entitled Hands-on outdoor learning benefits students in Canada in 2003 (10), Blair in a study entitled School gardens positively impact children's learning and behavior in USA in 2009(11); they concluded that determined that gardening can have a positive impact on student achievement and behavior. Lester et al. in a study begin by examining the human relationship with the natural world and the importance of play and direct interaction with the physical environment to children (12), have studied concerning to impact of schools' open space on learning and educational achievement of elementary students. The presence time of students in school yard shows that most of primary school children spend times in school yard, 15 to 30 minutes before beginning class, 30 minutes for break and 30 to 45 minutes for lunch. In other words, they spend 1.5 hours per day or 20% to 25% of their presence in school attending in the yard; for most kids, a time spent in the school yard is the time of game and communication and learning social and physical skills. In fact, most of informal learnings of social skills and constructive plays occur in school yards and play-fields (3). In recent years, the curriculum and textbooks has been considered, but this principle, the physical characteristics of educational environment and its impact on students' performance and spirit have not been investigated so much and only a few of studies have been carried out in this regard. Theoretically, paying attention to environmental factors affecting the educational environments and foresight on supplying facilities and needs of educational spaces not only help managers and planners in adopting right and realistic decisions, but also they are necessity of any kind of educational planning (13,14).

The aim of this study was to investigate the impact of schools' open space on learning and educational achievement of elementary students in Ahvaz, Southwest of Iran.

## 2-MATERIALS AND METHODS

### 2-1. Study design and population

At a cross-sectional study (2015-2016), the population of the study included all male elementary school students in Ahvaz, (South-west of Iran), of whom 210 students were selected randomly as the sample of the study.

Questionnaires were randomly distributed among students. Data collection tools included: Hermance's achievement motivation questionnaire and the researcher-constructed questionnaire (observation check-list to examine the physical parameters impact of schools' open space).

### 2-2. Ethical considerations

The ethical considerations necessary to satisfy the respondents were observed and they were ensured that their views will be kept confidential. Also, participation in the study was voluntary.

### 2-3. Measuring tools

#### 2-3-1. Construction Observation checklist

Observation checklist to examine physical variables of impact of schools' open space the learning environment: due to there is no standard questionnaire related to subject of study, after interviews with a number of teachers and experts organization development, equipping and modernization of schools, environmental health and collect their views and taking into account the scientific principles, a observation check-list was developed. Given the number of questions in observation check-list , the minimum scores obtained by each school (completely non-standard), and the maximum obtained scores by in terms of studied components, researcher marks each item in terms of meeting the standards according to three standard option of standard, semi-standard and non-standard. According to the observation check-list, standard schools were those schools which required the min scores based on confirmation of modernization, development and equipping of schools organization.

Then, by conducting pre-test (among 30 students), reliability and validity of questionnaire was calculated. Their validity was confirmed by content and construct validity was confirmed by a number of experts (5-teachar and 4 Health experts) and their reliability was calculated and confirmed by Cronbach's alpha (87%).

#### 2-3-2. Academic Achievement Motivation Questionnaire of Hermance

It is one of the most common paper and pencil questionnaire to assess the need for achievement. Hermance (1977) constructed this questionnaire based on experimental and theoretical knowledge about the need for achievement and studying the related literature related. The initial questionnaire included 29 questions developed based on ten characteristics that distinguish people who have high achievement motivation with those who have low achievement motivation. To prepare materials of questionnaires, Hermance considered ten characteristics of people as based in selecting questions:

- High level of desire;
- Strong motivation for upward mobility;
- Long resistance facing with assignments or moderate difficulty level;
- Willingness to reattempt in doing assignments;
- Dynamic perception of time, the feeling that things happen quickly;
- Foresight;
- Paying attention to merit criterion in selecting friends, colleagues and model;

- Recognition through good performance at work;
- Doing job well;
- Low risk behavior.

Hermance found these ten characteristics was acquired on the base of previous research and he selected them as guide for selecting the questions. After trial implementation and analyzing the questions and calculating the correlation of individual questions with total test, 29 questions were selected as final questionnaire of achievement motivation.

It should be noted that after analyzing the questions, no significant question about the tenth characteristics was included in the final questionnaire. Therefore, the final questionnaire was constructed only on the basis of nine characteristics. The questions of questionnaire were stated as incomplete sentences and multiple options were given for each of the. To equalize the value of questions, four options were written for all 29 questions. The options were given score in terms of intensity of motivation of achievement from high to low or low to high. Scoring the questionnaire was conducted based on nine characteristics that questions were developed based on them. Some of the questions were written positively, while other groups of them were written negatively.

T0 each question of this questionnaire (Observation checklist to examine physical variables of Schools' open space the learning environment), the minimum score (0) and maximum score (2) were assigned, in the other hand:

(0): If the school has not met the standard principles at all in the studied component (non-standard);
(1): If the school has met the standard principles relatively in the studied component (semi-standard);
(2): If the school has met the standard principles fully in the studied component (standard).

### 2-4. Data analyses

Data of study were analyzed using descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics (factor analysis, t-test, Kolmogorov - Smirnov test and one-way ANOVA analysis) at SPSS- 21 software. In this section, the descriptive statistics related to observation, a check-list to examine the impact of physical variables of schools' open space on learning and achievement questionnaire of students was provided. Then, statistical hypotheses were examined in the data analysis section. To evaluation of data distribution, Kolmogorov-Smirnov test was used. Then, to examine the hypothesis of study, structural equation and Pearson correlation coefficient were used, while single-sample t-test, independent two-sample t-test and ANOVA were used to examine the sub-hypotheses of study.

## 3-RESULTS

For investigating students' amount of learning and academic achievement (including 29 questions of 4 options), the Hermans' questionnaire was used as a research tool and for studying physical variables of schools' open space in educational spaces (including 5-question of the standard, semi-standard and non-standard of 3- option), a observation check-list; given the age of the respondents, the method of interview was used in completing questionnaires (with the help of their teachers). Based on (**Table.1**) in which the demographic characteristics of the students have been specifically mentioned, from between 210 elementary students samples under study, 11 students were from elementary second grade, 38 students from third grade, 63 students from fifth grade and 73 students from sixth grade. Also in terms of age characteristics of the students under question, 15 students were 7-year old, 21 students 8-year old, 38 students 9-year old,

63 students 10-year old, and 73 students 11-year old.

In (**Table.2**), regarding 4 questions related to the check-list of variables of schools' open space in educational institutions with three options standard(2), medium(1) and non-standard(0), the amount of point and score of students has been stated. The **first** question was about other buildings in the yard are not overlooking the school; 18(7.6%) students have selected the standard option, 20(8.4%) students the medium option and 53(22.4%) students non-standard option. The mean and standard deviation (SD) of this question have been 1.21±3.69 (of total score-4). The **second** question asked due to its non-proximity to tall buildings, the school yard is not shining of sunlight; 19(8.0%) individuals have selected the option standard, 31(13.1%) individuals the option medium and 84(35.4%) individuals the option non-standard. The mean and SD of this question have been also 1.15±3.22. The **third** question asked school yard has a garden and trees; 19(8.0%) individuals have selected the option standard, 55(23.2%) individuals the option medium and 100(42.2%) individuals the option non-standard. The mean and SD of this question have been also 1.03±2.95. The **fourth** question asked was about the school yard has a playing-field for students; 29(12.2%) individuals have selected the option standard, 58(24.2%) individuals the option medium and 94(39.7%) individuals the option non-standard. The mean and SD of this question have been also 1.06±2.81.

**Table.3,** shown that, there was a significant relationship between impact of schools' open space, and educational achievement of elementary students in Ahvaz, Southwest of Iran ($P<0.05$). Also in this research there was not observed any relationship between the demographic variables under investigation such as age, education level, education district of education place etc. and the amount of learning and academic achievement ($P>0.05$).

**Table 1**: Demographic information of students

| Variables | Number (%) |
|---|---|
| Educational grade | |
| 2 | 11(5) |
| 3 | 25(12) |
| 4 | 38(18) |
| 5 | 63(30) |
| 6 | 73(35) |
| Total | 210(100) |
| Age(year) | |
| 7 | 15(7) |
| 8 | 21(10) |
| 9 | 38(18) |
| 10 | 63(30) |
| 11 | 73(35) |
| Total | 210(100) |
| Educational area( in Ahvaz city) | |
| 1 | 50(24) |
| 2 | 41(20) |
| 3 | 59(27) |
| 4 | 60(29) |
| Total | 210(100) |

**Table 2:** The perspective of students about schools' open space

| Questions | Response | | | Mean± SD |
|---|---|---|---|---|
| | Standard N (%) | Moderate N (%) | Non-standard N (%) | |
| Other buildings in the yard are not overlooking the school. | 18(7.6) | 20(8.4) | 53(22.4) | 3.69±1.21 |
| Due to its non-proximity to tall buildings, the school yard is not shining of sunlight. | 19(8.0) | 31(13.1) | 84(35.4) | 3.22±1.15 |
| The school yard has a garden and trees. | 19(8.0) | 55(23.2) | 100(42.2) | 2.95±1.03 |
| The school yard has a playing-field for students. | 29(12.2) | 58(24.2) | 94(39.7) | 2.81±1.06 |

**Table3**: The relationship between the impact of schools' open space on learning and academic achievement

| Variables | | Observed frequency | Expected frequency | Remaining | P-value |
|---|---|---|---|---|---|
| Students' perspective | Standard | 26 | 79 | -53.0 | 0.001 |
| | Moderate | 63 | 79 | -9.0 | |
| | Non-standard | 121 | 79 | 62.0 | |
| | Total | 210 | | | |

## 4- DISCUSSION

Results of this study showed that Schools' Open Space has a significant impact on learning and academic achievement of elementary school students in Ahvaz. Therefore, we can say that the results of this study are in line with those of other studies conducted by Bazzar Chamazkoti (1), Ahmadi Afusi et al.(2), Malone et al. (8), Barros et al. (9), Dyment (10), Blair (11), Lester et al. (12), Dyment et al. (16), Muñoz (17), Dan Daviesa (18), Lewinski (19), Barrett **(**20**),** and also, Suleman (21).

The results of Malone et al. in Australia showed that there was a large variation between the schools, particularly in the types of play and environmental learning in which children engage. These variations are related to variations in the physical qualities of the school ground (8). Barros et al. concluded that teachers' rating of overall classroom behavior was better for children with some recess as compared to those with none/minimal break, however, the frequency and amount of recess was not significant. While data from teachers could be biased due to their feelings about recess, this study provides valuable information about the amount of recess 8- to 9-year-old children receive and relationships to classroom behavior (9). Dyment concluded that 90% of students reported that student enthusiasm and engagement in learning increased on green school grounds as compared to teaching indoors and 70% of respondents reported that their motivation for teaching increased on green school grounds as compared to teaching indoors(10). Blair showed in gardening can have a positive influence on the student achievement and behavior (11). Lester and colleagues discuss evidence demonstrating a decline in children's access and opportunities to play in natural spaces and provide a range of suggestions to support children's opportunities to play in natural settings, such as through the design of effective playgrounds, school grounds, and environmental play projects, as well as ensuring adequate access to parks and nature reserves (12).

### 5-1. Recommendations

Finally, 4 recommendations were provided as follows:

**1**. Due to relationship between components of Schools' open space and increased behavioral disorder among students, it is recommended that educational managers of country pay attention to psychological advices on colors, lighting, sounds and Schools' open space.

**2**. It is recommended that particular attention should be paid to educational space of schools in terms of designing and building. The physical environment spaces should be designed and built so that they can be compatible with inherent tendency and nature of students. In addition, solutions should be found for educational spaces requiring major repairs.

**3**. As standards and criteria determine the desired level, and since the desired level of one region might be different from other region, it is recommended that a committee to be established to assess the internal situation of schools in Ahvaz so that it can determine the desired standards and criteria and schools to assessed accordingly.

**4**. It is required that higher attention to be paid on ergonomic relationship with behavioral disorders in students since the beginning of pre-school education and conduct the assessment plan to detect children who have particular needs and attempt to organize children with behavioral disorder (13,14).

## 6- CONCLUSION

The presence time of students in school yard shows that most of primary school children spend time in school yard, 15 to 30 minutes before beginning class, 30 minutes for break and 30 to 45 minutes for lunch. In other words, they spend 1.5 hours per day or 20% to 25% of their presence in school attending in the yard. For most kids, a time spent in the school yard is the time of game and communication and learning social and physical skills. In fact, most of informal learnings of social skills and constructive plays occur in school yards and play-fields, where children spend much of their non-official time of teaching. Several studies show that 2 to 42 percent of children's outdoor activities are done in the play-fields.

In the present study, school buildings, a large gap with the standards. Theoretically, paying attention to environmental factors affecting the educational environments and foresight on supplying facilities and needs of educational spaces not only help managers and planners in adopting right and realistic decisions, but also they are necessity of any kind of educational planning.

## 7-CONFLICT OF INTEREST:

**1**. Impossibility of generalizability of the research results to schools in other cities, due to geographical and climatic conditions of metropolis Ahvaz.

**2**. The dispersion of research population and non-equality of facilities in schools in metropolis Ahvaz.

**3**. The use restriction of questionnaire as the only means of data collection and the impossibility of doing quality works in this regard, including interview with managers, parents and experts in ergonomics

**4**. The absence of standards according to which the quality of available possibilities and resources can be evaluated.

## 8-REFERENCES

1. Bazzar Chamazkoti R. The Role of Educational Environment on Student Achievement in Elementary Period. European Academic Research 2014; 2(5) 6240-57.

2. Ahmadi Afusi Z, Zarghami Z, Mahdinejad J. A Study on Designing Open Space School and its Relation.with Improving Happiness among Students. Indian Journal of Fundamental and Applied Life Sciences 2014; 4(S3) 924-31.

3. Feizi A. Developing Design Criteria for open area of elementary schools, Tehran:

Organization of modernization and equipping of schools in the country; 2010. p. 79-80

4. Sapna Ch, Sianna A, Victoria C, Andrew N. Designing Classrooms to Maximize Student Achievement. Policy Insights from the Behavioral and Brain Sciences 2014; 1(1): 4-12.

5. Dianat I, Karimi M, Asl Hashemi A Bahrampour S. Classroom furniture and anthropometric characteristics of Iranian high school students: Proposed dimensions based on anthropometric data. Applied Ergonomics 2013; 44(4): 101-8.

6. Gilavand A. Investigating the Relationship between Mental Health and Academic Success of Students in Ahvaz Jundishapur University of Medical Sciences. Persian Journal of Medical Sciences 2015; 2(3): 38-50.

7. Gilavand A, Espidkar F, Fakhri A. A comparative evaluation of depression and anxiety rate among native and non-native students of Dentistry School at Ahvaz Jundi Shapour University of Medical Sciences, Educational Developement of Jundishapur. 2015; 6(2): 186-90.

8. Malone K, Tranter T. Children's Environmental Learning and the Use, Design and Management of School grounds. Children, Youth and Environments 2003; 13(2): ISSN 1546-2250.

9. Barros R M, Silver EJ, Stein REK. School Recess and Group Classroom Behavior. Pediatrics 2009; 123(2): 431-36.

10. Dyment J. Gaining ground: The power and potential of school ground greening in the Toronto District School Board: Evergreen." 2005. This report was commissioned by Evergreen, a charitable organization focused on bringing communities and nature together and is available online at: http://www.evergreen.ca/en/lg/gaining_ground.pdf.

11. Blair D. The child in the garden: an evaluative review of the benefits of school gardening. Journal of Environmental Education 2009; 40(2) 15-38.

12. Lester S, Maudsley M. Play, naturally: A review of children's natural play." Children's Play Council.2006 This report is available online at: http://www.playday.org.uk/PDF/play-aturally-a-review-of-childrens-natural%20play.pdf .

13. Gilavand A, Hosseinpour M. Investigating the Impact of Educational Spaces Painted on Learning and Educational Achievement of Elementary Students in Ahvaz, Southwest of Iran. Int J Pediatr 2016; 4(2): 1387-96.

14.Gilavand A, Jamshidnezhad A. The Effect of Noise in Educational Institutions on Learning and Academic Achievement of Elementary Students in Ahvaz, South West of Iran. Int J Pediatr 2016; 4(3): 1453-63.

15. Akbari B. Validity of motivation questionnaire of Heremence on students of high school in Guilan Providence knowledge and research in educational sciences 2007;16:73-96.

16. Dyment JE, Bell AC. Grounds for movement: green school grounds as sites for promoting physical activity. Health Education Research 2008; 23(6):952-62.

17. Muñoz SA. Children in the outdoors: a literature review. Sustainable Development Research Centre (2009). This report is available online at: http://www.countrysiderecreation.org.uk/Children%20Outdoors.pdf .

18. Davies D, Jindal-Snape D, Collier Ch, Digby R, Hay P, Howe A. Creative learning environments in education—A systematic literature review. Thinking Skills and Creativity 2013;8: 80– 91.

19. Lewinski P. Effects of classrooms' architecture on academic performance in view of telic versus paratelic motivation: a review. Front Psychol 2015; 6: 746.

20. Barrett P, Davies F, Zhang Y, Barrett L. The impact of classroom design on pupils' learning: Final results of a holistic, multi-level analysis. Building and Environment 2015;89: 118-133.

21. Suleman Q, Hussain I. Effects of Classroom Physical Environment on the Academic Achievement Scores of Secondary School Students in Kohat Division, Pakistan. International Journal of Learning & Development 2014; 4(1) 71-82.