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The Impact of Environmental Factors on Learning

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ABSTRACT: Learning is a process. Several factors are interacted in this process. The type and intensity of interaction creates various changes. Although factors such as fitness, motivation and goal, past experiences, teaching, rehearsing, training facilities, etc. are effective in learning, but our aim in this paper is examining the environment impact in learning. To conduct the study, 16 sixth grade students among 307 elementary school students (in the second round) were selected from Bonrood area in Esfahan province (Iran). The method which used in this research was quantitative and qualitative and data collection tools was included questionnaires, observations and achievement tests. The results showed that, although there was a significant relationship between physical variables and learning, however, these variables effect the teachers' attitudes and teachers' attitudes also affect students' learnings. It was clear that our current school educational facilities are not compatible with psychotic features of children and adolescents Therefore, it is necessary to look for proper reforms in this situation. Although physical variables may have no impacts on academic achievements, they need to be considered for maintaining health and mental security in individuals

***Keywords*:** Learning, students, environmental factors, classroom, academic achievement

Introduction

Introduction

The infrastructure of social, economic, political, and cultural developments underpinned in each community is education. Factors affecting the development of successful societies show that all these countries have powerful education. Also, many factors act together in any educational systems to ensure students' learnings. The system should be prepared in a manner to provide consistent access to optimal efficiency and targets to be achieved, because if parts of the system stop working, the performance efficiency of other components will be reduced, not providing the desired results.

Location and environment are among the very effective factors on learning. Environments include buildings, light, air, equipment, sound, organizing classes, cooling and heating, sanitation facilities and training equipment. Naturally, students' learning in schools with more educational facilities, libraries and various academic resources, learning will be very different as compared to schools with students who have learning poverty and where nothing but text books are found in them.

Teacher-student relationship, students' relationship with each other, parent relationship with school and the views of parents and educators in education of children, all can be effective in students learning. Training along with kindness and respect has a greater impact on the learning in comparison with rigid environments.

Lack of negative factors such as fear, anxiety, despair and poverty, encourages students to be curious and trying to learn. However, learning environment needs to be appropriate with the students' readiness, talent, requirements and inclinations.

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Since this article focuses on the impact of environmental factors on learning, environmental factors were investigated regardless of other factors. In this regard the data including physical variables should be analyzed, in order to plan with more appropriate knowledge.

Hence, this paper seeks to answer two questions:

Is there a relation between classroom facilities and the students' academic progress?

Is there a relation between classroom attraction and student's academic progress?

Physical factors related to educational facilities and classroom attraction includes 12 criteria that is categorized and expressed in the following six classifications. The first five are related to classroom attraction and 6th classification is related to educational facilities.

1. The apparent dimensions of the classroom, including classroom walls, doors and floor; area per capita and space
2. Classroom organization and arrangements
3. Lighting and related factors such as the amount and intensity of the light and the type of lighting
4. Cooling and heating equipment.
5. Sound and its related factors.
6. Training equipment including blackboard and educational media.

Standards for this research, includes the criteria determined for a classroom by Ministry of Education, the Ministry of Health, and Organization of schools renovation and equipment.

1. Apparent dimensions: Required space for each student is 1.5 square meters with 5.5 cubic meters of air. (SultanManesh 1384)
2. Organization and arrangement of the classroom: Nvyfrt (1994) suggests that rectangular or trapezoidal shapes are the best shape for classrooms. Square, circular or oval forms, etc. are not suitable for audio aspects. Large curved areas create the focal points, causing great barriers for the sound (Malamud 1995). One of the most important parameters in the development of educational spaces is changing the attitudes and viewpoints of teacher and students and creating a space for students to interact with each other. For this purpose, essentially linear rows and layout of benches are recognized contrary to the students' morale and mentality.
   In traditional classrooms that students are sitting in regular rows and the teacher's desk is in front of the classroom, all the attention is focused on the teacher and the students' attention to each other is marginal and the students become unaware of each other, but also neglect group work. It is better for the classroom layout to be changed into semi-circular form in some instance. In this way, in addition to increasing the elaboration between teachers and students, instructing the class in group discussions and active participation of the students in teaching affairs lead to more appropriate learning.
3. Light and related variable:
   In general, 83 percent of learning takes place by the sense of seeing in the learning process, (Zoufan and Lotfi Pour, 1998). Classroom lighting is provided by natural light (through windows, openings, etc.), or artificial lighting (through light bulbs).

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Table 1: Light intensity required in different situations:

Type / accept / intensity and brightness according to Lux 2	
teach and lecture / green board	200-500
teach and lecture / blackboard	300-500
study / between shelves	100-200
study / desk study	300-500

Source: Institute of Iran Standards

Color is also to be considered and light and relaxing colors should be used for classrooms. Light blue or light green are appropriate for the walls and white is suitable for the ceilings. Wall paint is better to be washable. (Loess Taylor 2015)

4. Cooling and heating equipment, are also affecting factors on learning that inattention to them could lead to significant damage in learning and loss of life. Temperatures of 16-18 ° C are suitable for the classrooms and the air flow is necessary for it (Standard Organization)
5. Sound as well as is one of the most important factors in affecting the learning process. Although sounds may sometimes come inside the classrooms, but students hearing the voice of their teachers and just notice the subjects that they hear from their teachers. If the outside sound overcome the teacher's voice, then the learners set out unwanted noise with their hearing or they may even not hear any sounds including the teacher's
6. Equipment, training and educational media: Quality of the physical facilities in schools affects the interaction between the students and teachers. Better facilities, together with rich learning environment with more participation, better organization and different methods and different activities are related in subjects, including science lessons (more practical works) (Siavash Haghighi, 1373).

Research methodology

Correlation and causal research projects are used for comparison in this research, since the author has on one hand dealt with examining the relations between variables, and the difference between populated classrooms and the unpopulated classrooms.
Because of the use of three different tools (numerical data, surveys and observation), it can be said that this study is an intertwined or a qualitative/quantitative research. Although a causal relationship between variables should be considered in experimental research projects, but if the obtained data from causal/comparative researches are examined with regards to advanced statistical methods, such as regression or the path analysis, they can reflect causal relationships, to a great extent.

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Statistical samples and population

The population of the investigation includes sixth grade students (16 classrooms and 307 students), headmasters and teachers of schools in academic year 2003-2004 in Bonrood region, in Esfahan. Average aggregation of the students is calculated to be 19.18.
Applying stratified random sampling technique and by using the complete list of girls and boys and regarding schools for girls and boys and according to urban and rural schools in the area, the region was divided into two ranges for populated and average populated areas. A number of schools were selected randomly from each population ranges. Then, 16 classrooms including 307 students and the relevant teachers of the classes were chosen, as the respective classes. The selected schools were in Bon rood region.

Data collection tools

The tools (questionnaires, classroom observation form of physical variables, academic achievement test) were used.to conduct the research.
The following procedures are taken for preparation of the tools in this study.

1. *Questionnaire*
   Since there is no standard questionnaires in relation to the research, followed by interviews with a number of sixth grade teachers and the headmasters of elementary schools, collecting their views and considering the scientific, a questionnaire consisting of the Likert scale was developed. It should be noted that four questions in the questionnaire were about physical parameters used in this article and the rest of the questions were related to human factors as well as attributes and views of teachers.
   Validity of the questionnaire was examined and approved by education officials, education groups in organization, headmasters and teachers. SPSS software was used to determine the reliability of the questionnaire that was estimated to be 83%.

2. *Observation of physical parameters*
   A tables including ten phrases “good, average, poor” was provided to prepare observations, by using indicators and standards. This form examines the variables related to physical environment of classrooms. By direct attendance to the classrooms, observing classroom physical conditions and precise measurement of the areas of classrooms, the researcher compared them with the existing criteria. Validity of the observation form is confirmed by experts to be compiled according to the related measures in our country.

3. *Achievement test*
   In addition to the completed questionnaires and observations, this study involves a test run for coordinated educational achievements, since the results of internal school exams, held inconsistently could not be used as a benchmark to compare the achievement of the classes.

The test questions were of four major subjects, namely literature, science, mathematics and social studies, and 12 questions were prepared for each subject (total of 48 multiple-choice questions). In order to create coordination in measuring the learnings and according to the examination date (early May) as well as considering the possible differences in the contents of the material taught by teachers at schools, the questions were extracted from the book:

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The contents of the questions are as follows:
Social studies questions: Concepts such as geography, history and social sciences.
Literature questions: Concepts such as spelling, writing, grammar, meanings in poetry and composition of vocabularies.
Mathematics question: Units of measurement, geometry, integers and decimal numbers, fractions.
Questions of science: Biology, physics, geology, chemistry and natural resources and environmental issues.

Data analysis methods: The study involved both descriptive and inferential statistics. Using frequency, percentage, mean and standard deviation, each question was individually examined in the descriptive level. According to the specific characteristics of the study and categorizing the responses, variance analysis and path analysis tests were used (by two independent groups) with regards to the specific measures in this research, in inferential levels.

Results:

1. Frequency and percentage of responses related to teachers' comments on physical factors show the following matters.

The results show that most of the responses in high and very high levels are related to the effects of educational facilities on students' developments indicated 90.3% and the least responses was related to suitability of educational facilities with 30.6%.

2. The frequency and percentage of responses related to the physical parameters of the classrooms

The results suggest that the best parameter was related to the classroom floors with 81.9%, then doors with 50%, and heating and ventilation with 48.6%. The worst parameter was about the per capita area with 52.8%. The other parameters are evaluated as moderate.

3-Achievements
Academic achievement was studied by considering the variables such as school (girls and boys), the school location and the relevant regions.

The results showed that girl students had better performance than boy students in literature and social sciences, but average scores of boy students were higher in science and mathematics. It was also found that children from rural and urban areas have progressed almost equally. Average scores of literature and science lessons has been rather in urban students higher and the average scores of mathematic in them has been slightly lower than rural students, but there has been no significant difference between them, statistically.

Comparison of total average scores of students in the studying regions

Inferential analysis of the data related to evaluation research questions:

First question considers the relationship between classroom training facilities and academic achievement of students. Analyzing the situation of parameters regarding classroom facilities shows 21.5% of appropriateness regarding blackboards and 64.2% being undesirable. 33.6% of benches in classrooms are fine, 54.5% are in intermediate states and 5.9% of them are inappropriate and the average rate is 11.66%. Students' convenient sitting showed 9.45% to be appropriate, 59.2% moderate and 2.6% undesirable. Regarding educational media 36.5% was ideal, 54.6% was moderate and 7.9%

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was undesirable. In general, the relationship between the weighted average of the indexes and academic achievement in 16 sample classrooms was not statistically significant.

The second question examines the relationship between the attraction of the physical environment of the classroom and academic achievement of students. The results of correlation and multiple regression analyses have not shown significant relation between attractiveness of the classroom and the academic achievement, but the path analysis shows that classroom attraction has indirect effects on students' achievements. The results of the classroom observation form examines the related parameters about the attractiveness of classrooms, as stated in the introduction. The best parameters about the classrooms show 83.1% for classroom floor, 50% for the classroom door, 48.6% for heating and ventilation, 40.3% for quietness, 34.7% for light and 31.5% for classroom walls, respectively.

Discussion, conclusion and recommendations

The results from the parameters of educational facilities (blackboards, benches or chairs, sitting position of the students, teaching aids) indicate that the majority of the facilities are evaluated in medium to good range and have no significant relationship with academic achievements, but according to the results of path analysis, the rate of educational facilities of classrooms have indirectly had effects on the students' achievements. The reason for the lack of a significant relationship between these two variables is perhaps due to the fact that human factors such as teacher attitudes, teaching methods and patterns, interested students and teachers in the classroom and their attitude towards their abilities can compensate the hard conditions resulted from shortage of educational facilities.

Thus, it is recommended to use classrooms with specific characteristics for each subject (e.g. special classrooms for science, arts and multi-purpose classrooms).

The results of the second question showed that no significant relation is observed in the correlation test and multiple regressions, between attractiveness of classrooms and academic achievements, but the path analysis has indirectly shown the effect of classroom attraction on academic achievements, in such a way that it has affected the viewpoints of teachers and the teacher's viewpoints affect academic achievements. Perhaps it is because the capable teacher can make the learning environment for the students to be desirable by applying proper methods in hardest physical conditions. In addition, lack of statistical significant relation does not mean that there is no positive relationship between these two variables. However, in order to maintain health, mental safety and convenience of students and teachers, it is required for the physical variables to be considered, and the required matters to be observed in constructing educational areas. Achieving peace and having access to it is possible when educational buildings are compatible with human psychological and intellectual characteristics.

Therefore, the design and implementation of training places should be in such a way to minimize unfavorable climatic conditions and biological conditions such as light, ventilation, humidity, and especially the temperature be in optimal levels for the learners.

According to the result of this study, one of the factors affecting students' academic performance is the viewpoint of teachers towards classroom educational facilities.

Educational activities of school must have a suitable space with good facilities, based on the needs and interests of students in various fields for the teachers to have motivations in teaching and the students to have motivations in learning, and enjoy their activities.

According to the research results, it is proposed to pay special attention to designing educational spaces in order to provide active learning. Although we have stepped into the era of science and technology, but by entering the classrooms, we think we have returned at least to a century into the past. No signs of transformations are seen in many of the classrooms, or we could only observe apparent but negligible changes.

It can be said that educational environment should increase the students' interests to other environments. These facts along with other factors should be encountered not superficially, but fundamentally, in the present century. However, it requires the efforts of the authorities for educational cases, since our educational aspects including educational spaces have long way to reach proper standards.

Regarding the physical learning environment and its impact on the educational process, various researches are done in recent years and fortunately initial steps are taken, but it requires serious further exploitations. In this regard, the role of school teachers and administrators is more prominent than other factors, since they could provide changes in the school environments in accordance with the interests of students, for them to feel satisfied and be enthusiastic to attend into their schools. However, considering (Environmental Psychology) is essential for newly established schools.

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