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Effect of School Environment on Students' Achievement: Cross Comparison of Urdu and English Medium Classes in Punjab Province

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Abstract

This study was conducted to find out the impact of school environment on the academic achievement of students in both Urdu (National) and English (2nd language) medium classes in public schools. A sample of teachers and head teachers was selected from eight districts of Punjab province using multi-stage cluster random sampling techniques. Keeping in view gender and locality considerations a sample of 36 head teachers and 72 science teachers was selected from sample selected schools. Two types of instruments i.e. a rating scale for teachers and a Checklist for head teachers were used to collect information. It was found that school environment has positive impact on students' achievement and this effect is more in English medium schools as compared to Urdu medium schools. Whereas the classroom specific environment in Urdu medium schools has better effect on students learning than English medium schools. To improve students' science learning a better school environment is a good contributor.

Keywords: Physical environment, academic environment, classroom environment, medium of instruction, science scores.

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Introduction

Education is considered as the basic infrastructure for future development and prosperity of any nation in every field of life. Moreover, in the modern era, role of education has been changed. In the past, education was considered as a tool for human development but now it is used as a tool of development in every field such as political, economic, social and human resources (Abbas, 2007). Most of the human developmental aspects are directly related to the science education. Therefore, science education is a basic need of human beings and necessary for the development of society. So, attaining scientific literacy particularly practical aspects of science education must be viewed as central to education reforms (Pattanayak, 2003). In developing countries of Asia as a general and in Pakistan as a particular the main focus of teachers and students remains on better scores which are based on the text book content memorization and traditional examination system. It is the basic reason why students' conceptual knowledge is weak and they only memorize things without understanding.

Requirements of education provide a direction for teaching learning process at all levels particularly at primary level (Hudson, Skamp, & Brook, 2005). Effectiveness of teaching learning process depends upon multiple factors i.e. teachers' competencies, students' intake, curriculum standards, school environment and classroom environment. Heshong (2003) mentioned in results of a study that teachers desire more space, good looking location, quiet and peaceful environment. Brennan et al., (2002) argued that employees of open offices were unsatisfactory. In developing countries, like Pakistan, majority elementary and secondary classrooms are like open offices and teachers show their agitation in many formal and informal meetings. Students science learning is directly related to school environment. These characteristics include students' learning through communication between teachers and students, curriculum implications, teaching methodologies and internal and external activities of the school (Mortimore, Sammons, Ecob, and Stoll, 1988).

More specifically, school environment includes such school setting which promote students' health and safety, sports for students' physical and mental health, academic environment, fairness in dealing with students and assessment procedures (Zais, 2011). Philips (1997) was of the view that classroom lighting system is the main aspect of classroom setting which have direct impact on students' academic activities.

Furthermore, Dunn (1985) extended the view that classroom lighting set up creates sense of aesthetics among students and teachers also. According to the views of Onukwo (2004), noisy and disturbing environment produce students' poor performance while on the other side, students' friendly and safety school environment effectively produce better students' performance.

School climate promotes effective teaching and multiple activities of teachers which then creates better understanding and achievement level of students (Freibery, 1998). So we can conclude that positive school climate yields improvements in educational and psychological outcome while on the other side, a bad school climate results in the prevention of effective teaching learning process. School environment/climate also includes mutual trust, obligation for students' welfare. These aspects of school climate also result on better students' academic achievement. In a research Hayness and Corner (1993) mentioned that positive and supportive to cultural aspects environment in urban school promoted significantly students' academic success. Further extension showed that better school climate improves students' performance in all demographic environments.

The medium of instruction plays the pivotal role in the teaching learning process. Medium of instruction either play role of bridge or hindrance between students and teachers. The medium of instruction is the specific language which a teacher uses during teaching learning process. Regional/Native languages are important elements in socialization and personality development. They are learned at home and in neighboring locality and provide identity in terms of one's culture and social traditions. This is Urdu language which is easily understandable by students of Punjab province and is an effective language for socialization. Most of the traditional and cultural knowledge of Punjab province is communicated in Urdu language. Urdu is used in majority of schools as a medium of instruction. Not only in Punjab, but Urdu is common language in all over the areas of Pakistan.

On the other side, English is used as a medium of instruction in many countries especially the ones who remained the colonies of English. English not only plays the role of language of communication but is also valued for itself as the language of a model of life or society (Beacco and Byram, 2003). In spite of importance of English language as an international language and the language of science and technology the researches show that English is not appropriate medium of instruction when it is a 2nd language for the people. First language or mother tongue is better for in-depth learning and conceptual understanding rather than

alien or other than mother tongue (Yip, Wing & Sin, 2003). In the same way, according to the views of Zahiah & Sallehudin (2011) for higher order thinking development mother tongue plays key role. Particularly, science learning in English or other than mother tongue is a tough job for students because they have to pay double attention for learning process i.e. understanding of language and understanding of concept (Kim & Wei, 2007). Using second language as medium of instruction, language becomes barrier for learners (Rollnick, 2000). In another study conducted on medium of instruction in Malaysia by Abdullah (2009) highlighted second language is a barrier for science learning.

In Pakistan, English is neither regional/local language nor National, but it is treated as foreign language (EFL) and Urdu is commonly known language by majority of the inhabitants of Punjab province. Previously, government institutes only offer Urdu as medium of instruction but now they are offering Urdu as well as English as medium of instruction.

Keeping in view the above main aspects for the efficiency of science learning i.e. school environment and medium of instruction it was decided by the researchers to view the impact of school climate/environment on students' academic achievement both in Urdu and English medium classes in Punjab province.

Objective of the Study

Main objective of the study was to identify the effect of school environment on students' Science learning in English and Urdu medium classes at grade VIII level in public schools of the Punjab.

Hypothesis of the Study

To address the above mentioned objective a null hypothesis was designed as under:

School environment does not affect students' Science scores in both English and Urdu medium classes at grade VIII level in public schools of the Punjab.

Methodology

Population

All the science teachers teaching to grade 8 and head teachers of high and higher secondary public schools in Punjab province was the population of this study. Eighth grade is terminal stage of elementary education in Pakistan and secondary classes start from grade 9th where students have option to study science subjects or arts subjects in future. As the future whole study of students depends upon this decision, therefore, 8th grade students were included in population of this study.

Sample

The true random sampling techniques are considered the best one for true representation of the population in the sample (Neuman, 2006). In this way six districts were selected randomly from three regions of Punjab province i.e. Northern, Central and Southern. Bahawalnagar, Multan, Sialkot, Faisalabad, Jhelum and Chakwal districts were selected as sample districts. Furthermore, public sector schools having sections of both Urdu and English medium classes for general science teaching to 8th class were considered to select the sample. Then from each district, six schools (3 Male and 3 Female schools) were selected through random sampling technique. Total number of schools selected in the sample were 36.

Two (2) teachers, one teaching Science subject in English medium class and the other teaching in Urdu medium class were taken as sample from each sample selected school. The total number of teachers in the sample was 72 (36 male and 36 female teachers).

As the total number of public sector schools selected in the sample of this study was 36, so all the thirty six (18 male and 18 female) head teachers of sample selected schools were also included in the sample of this study.

Instrumentation

To collect the required information two types of instruments were developed. The instruments were i) checklist for head teachers ii) rating scale for teachers. Students' scores in science subject achieved in Punjab Examination Commission annual examination were used as their achievement level.

The required two instruments were developed as under:

1. As the school climate is closely related variable to the learning achievement of students. Mainly there were three aspects of school climate i.e. physical facilities, academic facilities and classroom environmental facilities of school. Checklist consisted of above

mentioned areas was developed on three points. Head teachers were the most appropriate persons to respond about these facilities of any institution. Therefore, data about school climate, facilities and teaching learning environment was collected from head teachers through a checklist.

2. Second instrument was rating scale for teachers. There were two parts of this instrument. In the first part, there was demographic information of teachers and the second part of this instrument consisted of statements about school climate. After the final preparation of the instrument, it was translated into Urdu language for better understanding of all the statements given in the instrument. Hence bilingual rating scale was used for data collection from teachers.

   Both the instruments were got validated from educational experts who had knowledge and experience of assessment and questionnaire development.
3. The students' Science scores in annual examination conducted by Punjab Examination Commission (PEC) were considered as their achievement level.

Data Collection

After the final preparation of both instruments, they were administered to sample selected schools. Mainly the researcher personally collected the data by visiting the selected schools. From the three districts i.e. Sialkot, Faisalabad and Jhelum, researcher visited the selected schools and got filled the instruments from the head teachers and teachers. Researcher faced multiple problems in data collection. Particularly, journey to sample selected schools was very tough on public transport. Secondly, teachers were more afraid off giving information . They were assured that this data will be used only for research purposes. A guidance manual for data collectors was also developed to maintain quality and uniformity. The response rate of teachers and head teachers remained 92% and 94% respectively.

Data Cleaning and Analysis

Data cleaning is fundamental to maintain the quality of database (Chapman 2005). If outliers or inconsistencies will present in the data, the data will significantly distort the results. Where ever human are involved in any process there are chances of errors. Similarly, in data entry there

may be chances of typographic errors or misunderstanding of data errors. Data cleaning is base to improve the quality of data and make data "fit for use". Redman (1996) mentioned that if we make extraordinary efforts to minimize errors in data even then we expect 1-5% error rate in data entry. Keeping in view the importance of data cleaning for final analysis, data was cleaned and improved before final analysis.

Data Analysis and Results

Learning environment; means physical locations, contexts, supportive material and cultures of a place where students learn.

School environment; is also the place/school having required facilities, appropriate classrooms, infrastructure, healthy discipline policy and peaceful surroundings.

The data was collected on five point rating scale and coded from strongly disagree as 1 and strongly agree as 5. The data collected was divided into three main categories i.e. good, better and best.

Table 1

Effect of School' Physical Environment on Student's Science Scores in English and Urdu Medium as Perceived by Head Teachers

	Good Environment		Better Environment		Best Environment			
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*F*	*Sig.*
English	49.39	15.859	56.00	18.385	60.80	16.010	11.08	.000
Urdu	50.06	14.267	51.90	14.428	54.47	14.284	.720	.487

Table 1 shows effect of physical school environment on student's science scores in both English and Urdu medium as perceived by head teachers. The results show that there was significant difference of science scores in English medium classes ($p = .000$) across different levels of physical environment in public sector schools. Urdu medium classes having different level of physical facilities did not show significant difference in their science scores. Therefore the null hypothesis Ho1 was rejected for English medium classes but accepted for Urdu medium classes. This means that there is positive impact of physical environment on students' science scores in English medium but no effect for Urdu medium classes. Normally in Urdu medium classes,

students are provided average facilities almost to all schools in a uniform way, but in English medium classes difference of facilities produced difference in results.

Table 2 shows that academic environment of schools has a significant impact on students' science scores both in English (p= .000) and Urdu (p= .005) medium classes. As the difference was significant therefore, the null hypothesis "School' academic environment does not affect students' science scores in both English and Urdu medium classes at grade VIII level in public schools of Punjab province"

Table 2

Effect of Academic Environment on Student's Science Scores in English and Urdu Medium Classes as Perceived by Head Teachers

	Good Environment		Better Environment		Best Environment			
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*F*	*Sig.*
English	41.21	9.294	43.09	15.374	51.76	16.415	22.170	.000
Urdu	49.19	12.994	53.22	14.931	55.52	13.587	5.324	.005

was rejected. This means that school academic environment has positive impact on students' science scores both in English and Urdu medium classes

Table 3

Effect of Classroom Environment on Student's Science Scores in Both English and Urdu Medium classes as Perceived by Head Teachers

	Good Environment		Better Environment		Best Environment			
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*F*	*Sig.*
English	48.49	16.283	49.86	15.108	50.70	16.042	1.435	.239
Urdu	47.96	13.315	52.15	14.038	58.69	13.799	18.343	.000

Table 3 shows that there is no significant difference in students' scores in English medium classes (p= *.239*) due to different levels of classroom environment but classroom environment levels are significantly affecting students' science scores (p= *.000*) in Urdu medium classes of public

schools. The null hypothesis Ho3 was rejected for Urdu medium class and accepted in case of English medium classes. This means classroom environment has positive impact for Urdu medium classes. In English medium classes classroom environment is not affecting students science scores which means that classroom environment in schools may be more similar to each other.

Table 4

Effect of overall School Environment on Student's Science Scores in English and Urdu Medium as Perceived by Head Teachers

	Good Environment		Better Environment		Best Environment			
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*F*	*Sig.*
English	50.01	16.488	50.03	15.714	56.93	15.276	1.364	.256
Urdu	49.97	14.469	53.60	14.197	53.47	13.693	4.950	.007

Table 4 shows effect of overall school environment on student's Science scores in both English and Urdu medium classes as perceived by head teachers. The results highlight that different levels of overall school environment significantly affect students Science scores in Urdu medium classes ($p= .007$) but no effect is seen in English medium classes ($p= .256$). The null hypothesis "Overall school environment does not affect students' Science scores in both English and Urdu medium classes at grade VIII level in public schools of the Punjab as perceived by the head teachers." was rejected for Urdu medium Classes but it was accepted in English medium classes

Table 5 shows effect of overall school environment on student's Science scores in both English and Urdu medium classes as perceived by teachers. The results indicate that there is significant difference of students Science scores in both English medium classes ($p= .000$) as well as in Urdu medium classes ($p= .000$) due to difference of school environments. As the difference was significant among the Science scores both in English medium and Urdu medium classes because of overall school environment as perceived by the teachers therefore, the null hypothesis "Overall school environment does not affect students' Science scores in both English and Urdu medium classes at grade VIII level in public schools of the Punjab as perceived by the teachers." was rejected. School environment has positive

impact on students' Science scores in both the medium of instructions according to the views of teachers.

Table 5

Effect of overall School Environment on Student's Science Scores in English and Urdu Medium as Perceived by Teachers

	Good Environment		Better Environment		Best Environment			
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*F*	*Sig.*
English	47.48	15.025	50.92	15.566	65.71	10.291	23.673	.000
Urdu	49.78	14.468	53.42	13.819	60.10	12.319	8.887	.000

When we compare the results given in table 4 and 5 it is found that perception of head teachers and teachers is same in respect of Urdu medium classes. But in case of English medium classes head teachers perceive that overall school environment has on effect on students science scores whereas teachers perceive that overall school environment improves student science scores.

Discussion

As discussed earlier there are three main aspects of school environment i.e. physical school facilities, academic facilities and classroom facilities. Physical school facilities (drinking water, noiseless environment etc.) have significant impact on students' science scores. Availability of high level physical facilities showed significant better impact on science achievement than low and moderate level physical facilities. Coon, Carey, Fulker and Defries (1993) also found that school environment have positive effect on students' achievement.

The second aspect of school environment is academic supportive environment (teachers' attitude, encouragement on better performance etc.). It was also found that academic supportive environment have positive impact on students' science achievement which means more the supportive environment better the results in both English and Urdu medium classes. It is consistent to Hale (2002) results who concluded that school environment (lighting, infrastructure etc.) have positive

correlation with students learning achievement. Rydeen (2003) was also of the same view about effectiveness of academic environment.

The third aspect of classroom internal environment (ventilation, availability of writing board etc.) also plays a key role in teaching learning process and it is also concluded that classroom environment has significant positive impact on students' science scores. This impact was observed significantly in Urdu medium classes rather than in English medium classes. Results are similar to the research findings of Cotton (2001) that learning supportive environment is necessary for better teaching learning process. The English medium classes' environment may be more similar to each other and did not affected students' Science scores.

On the bases of results, it is recommended:

Learning supportive elements (physical, academic and school environment) be promoted in the school for better efficiency of teaching learning process.

A parallel study should also be conducted for math teaching to see the real importance and role of medium of instruction in teaching learning process.

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