

IMPACT OF SCHOOL SCIENCE LAB ON STUDENTS ACADEMIC ACHIEVEMENT AT SECONDARY SCHOOL LEVEL

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ABSTRACT

Now a day one's cannot neglects the vital role of science lab especially in school science subjects such as biology, chemistry and physics. So, the present study investigates the impact of science laboratory on students' academic achievements at secondary school level in southern Districts of Khyber Pakhtunkhwa. A total of seven hundred students and teachers were drawn from twelve government secondary schools' students and teachers in this study. The data was collected through self made questionnaire which consisted on Yes/No options. The collected data was properly analyzed through SPSS. The sample size was taken according to John Curry (1984) formula. For analysis of data frequency, percentage and regression were used. It was observed from the result that there is significant relationship between student's academic achievement and school laboratory.

Keywords: School lab, students' Academic achievement, Secondary school

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INTRODUCTION

(Soyibo, 1987) investigated that without the proper used of school lab it was not possible to clear the ideas and thoughts of students' in science subjects particularly in bio, physics and chemistry. He discussed that in science laboratory those students who are intelligent and genius taking more interest instead of other classes they attend, it is because they get more fruitful information than attending other subject classes. Further he declared that that those students who attended school laboratory were found problem solving and creative minded. (Ifeakor, 2006) explained that in fact school laboratory was one of the most important sources to save the time. He said that those students' and teachers who were completely facilitated with school laboratory during their teaching learning process, their performance was found better than those who were deprived with these facilities in their schools. (Hager, 1974) claimed that uses of school science laboratory directly improve both the academic performance and behaviors of students. He described that habitual lab practices make the students' learning process effective, fruitful and interesting. Further he stated that provisions of school laboratory for students at secondary school level make the whole educational program progressive and successful.

(Akpan, 2006) investigated by using percentage and frequency, he stated that 61% result of the total respondents were in favors of that school laboratory has significant relationship with student's academic achievement especially in science subjects. While the remaining 39% respondents' views showed that science lab has no impact on students' academic performance. According to a workshop which was held in (2008) by UNESCO, it was decided in the workshop that teachers who taught science subjects like chemistry, biology and physics; they complained that there were ni proper arrangement of and provisions of school laboratory in schools. They stated that providing of advanced lab

facilities is very essential for learning of science subjects at secondary school level.

Lagoke, (1997) described about the importance and need of laboratory facility at secondary school; he stated that by using science laboratory students' can get information regarding scientific skills and principles help them to make their future shine and successful. Further he explained that accessibility and well-prepared science laboratory have positive relation with students' academic achievement. Aburime, (2004) concluded that in science teaching subjects such as physics, bio and chemistry availability of enough school laboratories have significant impact on academic achievement of students.

Farombi, (1998) defined that laboratory is a room or building that is established for the purpose of practical work. He stated that for the better learning laboratory facilities in schools must be provided at priority basis, because without proper arrangement and availability of laboratory the teaching learning process become slow and frustrated. Ogunniyi, (1983) explained that school laboratory has vital role in teaching learning process. He stated that practical work makes the person perfect.

Yadar, (2007) investigated that science laboratory has very important place in education. He suggested that laboratory work means practical work help the students' in preparing practical life. He also discussed that availability of school laboratory assist the students in the science subjects and also in mathematics. Hofstein, (2004) stated that science lab activities have long distinctive and central role in the science curriculum and science educators have suggested that many benefits gained from engaging students in science lab activities. Hofstein et.al (2005) described that science laboratories have the potential to improve and developed secondary school students' abilities and skills.

RESEARCH METHODOLOGY

Research methodology consist the design of the research, population, size of the sample and sampling technique.

Research Design

The study was descriptive in nature focusing on finding out the impact of school science lab on students' academic achievement at secondary school level. The researcher used survey method for the collection of related information from the Government secondary schools' students and teachers in southern districts of Khyber Pakhtunkhwa by using two self developed questionnaires. One questionnaire was used for students which were translated into Urdu in order to understand the statements easily used by the researcher and the second was used for teachers.

Population of the Study

Participants of the present study were consisted on 700 respondents out of which 500 were boys and girls students of 12 Secondary Schools. Similarly, 200 were male and female teachers of the selected Secondary Schools of the two district i-e Bannu and Lakki Marwat as shown in the table below.

Table: 1 Total population of Secondary School students and teachers

District wise students		:	District wise teachers				
Bannu:	8081	DI. Khan:	10182	Bannu:	1290	D.I. Khan:	1557
Karak :	7591	Kohat:	9121	Karak :	1163	Kohat:	1005
Lakki:	9246	Tank:	2081	Lakki:	1002	Tank:	440
Total students: 46302				Total teachers: 6457			

Sample size and sampling technique

To select sample for the present study from the selected population simple random sampling technique was used. As a sample total 700 respondents were taken, containing 500 students and 200 teachers, out of which 250 were

boys students and 250 were girl students of twelve secondary schools. Similarly, 200 male and female teachers were also selected as sample from both the districts of twelve secondary schools as shown in the table below. According to John Curry sample size rule of thumb, the researcher selected the respondents through simple random sampling technique.

Table: 2 Respondents in the form of sample

DISTRICT	Male	Respondents		Female	Respondents	
BANNU	Schools	Students	125	Schools	Students	125
	03	Teachers	52	03	Teachers	48
LAKKI MARWAT	Schools	Student	125	Schools	Students	125
	03	Teachers	52	03	Teachers	48

Analysis of data

Descriptive statistic i-e percentage and frequency was used to get information about the variables. While inferential statistic i-e linear regression was used to conclude the result. The data was processed through SPSS -16.

Measurement Scale

To measure the views of the respondents' dichotomous scale having yes and no options was used.

Pilot Study

Pilot study is called practicability also; it is because that it is a very important part of the good research design. With the help of pilot testing, in this study the proof of validity of the collected instruments was cumulated. The first draft which was validated was administered among eleven experts. Those corrections and concepts which were suggested by the experts were incorporated. According to the suggestions given by the experts, the researcher developed the final draft of the questionnaire.

As reliability, among sixty female and male respondents the research tools were administered. To evaluate the reliability, Cronbach alpha formula was used. The items whose total correlation was .25 or less than .25. Thirty (30) items having .893 Cronbach alpha were left.

RESULT AND DISCUSSION

As a result, it was concluded that science lab has positive relation with secondary schools' students in Khyber Pakhtunkhwa southern districts. It is clear from the below table that secondary school laboratory has positive impact on students' academic achievement.

Table: 3 linear regressions showing the impact of the mentioned variable

Dependent Variable	Respondent Students	R	R²	Df	F-	P	β	Sig
Academic achievement		.520 ^a	.270	1 498	184.133	.000 ^a	.520	.00
Independent School science lab	Respondent Teachers	.290 ^a	.084	1 198	18.132	.000 ^a	.290	.00

Significance value > .05 shows insignificance and < .05 shows significant influence > greater than, < lower than

Result of the linear regression used to analyze the impact of school science lab on students' academic achievement in the above table 3. The value of R square .270 is the explained variance which is actually the square of multiple R (.520a)² and shows a relationship of independent variable (school Science lab) with dependent (Academic achievement). F-value (184.133) found significant at .000 level of significance. The Beta score in the eighth column which is (.520) also found significant at (.000^a) level of extremely significance. The above inferential statistics represent that science laboratories have great impact on students'

academic achievement. Similarly, the 2nd part of the same table also used to analyze the impact of school science lab on students' academic achievement. R square .084 is the square of multiple R (.290a)² which determine relationship of independent variable (School science lab) with dependent variable (Academic achievement). F value (18.132) founded significant at.000 level of significance. Beta score (.290) also founded significant at .000(a) level of extremely significance. The above description also revealed that school science lab has significant impact on students' academic achievement at secondary school level.

Table: 4 Respondents views regarding the impact of science laboratory on students' academic achievement

Respondents	Freq & Percentage	Yes	No	Total
Students:	frequency	333	167	500
	percentage	65	35	100
Teachers:	frequency	139	61	200
	percentage	68	32	100

The above table No 4 shows views of the respondents about the impact of science lab on students' academic achievement. It indicates that the total numbers of the respondents were 700 out of which five hundred (500) were students and two hundred (200) were teachers. 333 (65%) students' views revealed that (yes) while 167 (35%) students' responses indicated (no). Similarly, 139(68%) teachers' views show "Yes" while 61 (32%) give "No" about the impact of science lab on the student's academic achievement.

CONCLUSIONS

Based on the analysis and interpretation of data, it was concluded that the regression table revealed that School science lab had high positive impact on students' academic achievement at Secondary school level in Southern districts of Khyber Pakhtunkhwa.

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