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Relationship between Co-curricular Activities and Exam Performance: Mediating Role of Attendance

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Abstract

Benefits of co-curricular activities (CA) are numerous, including self-confidence, communication skills and good physical health. So far, little importance has been given to study the relationship of co-curricular activities and exam performance in Pakistan. Consequently students are living in an environment where they have little idea of how co-curricular activities affect their exam performance or grades. They only give importance to their studies in order to achieve higher grades in exam. This research study examined the role of co-curricular activities and exam performance of students at different levels of class attendance. Secondary data (co-curricular participation data, attendance of 10^{th} class and grades in 10^{th} class board exams) of 636 students through multistage purposive sampling was collected from thirty high schools of Lahore. Multiple regression analysis demonstrated that co-curricular activities have positive impact on student's exam performance. Sobel test of mediation showed that attendance partially mediated the association of involvement in co-curricular or non-classroom activities with exam performance. Participation in co-curricular activities improves class attendance of students which then play an important role in achieving high grades in exams. "Independent sample t-test" showed that students who were involved in co-curricular or non-class room activities had better grades or exam performance from those students who were not part of these activities. When both male and female students participated in non-classroom activities then female students had higher average exam grades.

Keywords: Co-curricular activities, class attendance, exam performance, schools, Pakistan.

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Introduction

Knowledge nourishes the human mind and physical exercise helps body to be in good shape. Knowledge and physical health both are necessary for young ones to prosper in their lives. With the passage of time youth may face different problems like substance abuse, indecent behavior, absenteeism from school and violence. All these problems may disturb parents, teachers and learning environment. To overcome these problems, schools, community and parents should work together (Dryfoos, 1990; Werner & Smith, 1992). Young ones need an environment which offers them opportunities to participate in different activities as they grow up. Schools and community can provide them with opportunities for different activities in the school and outside the school which may help them to shape their behavior and personality. Participation in different activities by students may be an easy way to change the lives of young ones (Holland & Andre, 1987). In Pakistan little importance has been given to study the relationship of co-curricular activities and exam performance. No attempt has been made to investigate whether there is any positive or negative impact of co-curricular activities on academics. Small schools without playgrounds in community have completely neglected the importance of co-curricular activities in students' behavior and lives. Students face huge burden of studies as schools only focus on tough schedule of studies to improve students' exam performance. This routine may affect physical health of students which may lead towards bad performance in exam grades. A large number of private schools in Pakistan are charging heavy fees but are not able to provide a good quality environment for co-curricular activities. Although government schools are offering somewhat better co-curricular activities to their students, yet most government or private schools in Pakistan don't have a proper system for co-curricular activities.

This research study intends to explore the relationship of co-curricular activities and exam performance of students at different levels of class attendance. This research study focuses on the role of co-curricular activities and exam performance of the students in the presence of class attendance and does not take into scope other factors e.g. engagement in different work related activities to meet study expense, which might affect student performance.

Co-curricular Activities (CA)

There are different views about extra-curricular activities. Education system in schools offers co-curricular activities at all levels (Foster, 2008). The activities e.g. "co-curricular activities, non-classroom activities and extracurricular activities" all have the same meaning referring to participation in music, drama and debates, etc(Emmer, 2010).

Activities on voluntary basis which are being offered by the school and are officially approved and have no extra marks or grades in exam are considered co-curricular activities (Lunenburg & Ornstein, 2008). Student participation in such activities depends on the opportunities which are being offered by school at different levels. Experience from these activities shape an alternative curriculum—one that helps to shape the behavior of the students and is well incorporated into the daily program of the school (Barbieri, 2009). Both opportunities for extra-curricular activity and the extent of involvement in these activities may affect the holistic development of individuals (Eccles, 2003). Involvement in these activities may be beneficial in various ways e.g. it can encourage healthy lifestyle or personality development at an early stage. Extracurricular activities provide such learning which cannot be taught from subjects in class room and it helps young ones to apply their classroom learning (Lunnenburg, 2010).

Exam or grade performance of students is also linked with the level of involvement in such activities. Students who participate in various non-class room activities are also more engaged in school time, have better exam grades and motivation towards education (Fredricks & Eccles, 2006). But students who take part in at least some co-curricular activities perform better in exams than those students who don't participate at all (Reeves, 2008). Youth development includes improvement in academics, social life, association with family, confidence, caring and compassion and character building (Morrissey, 2005). There are multiple activities for students to participate, but it is important for students to know which activities benefit them the most. Extracurricular activities may have negative consequences such as facing bad behavior of a coach to degrade team members or to spare every free minute in multiple activities, but the positive consequences widely outnumber those and are instrumental in individual's development (Eccles & Barber, 1999). Research on co-curricular activities has linked a number of outcomes with students' participation in co-curricular activities as shown in Table 1 below:

Table 1
Education statistics of students

Indicator	Participants	Non-Participants
No unexcused absences	50.4	36.2
Never skipped class	50.7	42.3
Expect to earn bachelor's degree or higher	68.2	48.2
Have CGPA of 3.0 or higher	30.6	10.8
Highest quartile on math & reading assessment	29.8	14.2

Source:(The condition of education, 1999)

National Center for Educational Statistics (NCES) also stated that there is high awareness about co-curricular activities among children but unfortunately the participation remains low for minority and poor students. Participation in such activities is perhaps the best investment that a school can offer to his poor students to improve their performance (Everson & Millsap, 2005). Level of involvement in any activity and its intensity is also important (Gardner, Roth, & Brooks-Gunn, 2008). How students are involved in co-curricular activities may also produce difference results in terms of impact on individuals. It is therefore important for students and school to know why students and individuals need to involve in co-curricular activities and what steps should be taken to reduce some negative consequences of participation in such activities.

Benefits of being involved in co-curricular activities are numerous and it leads to positive youth development. But what exactly does this means? According to Eccles (2003) involvement in voluntary activities in school may increase achievement and participation. This is so because student's interpersonal skills and social norms are developed and consequently they get more involved in pro social programs which then help to improve their emotional wellbeing and social networks. The involvement in such activities is then expected to contribute towards the improvement in grades and it may also help to reduce behavioral issues. Daley and Leahy (2003) found that mental health of the young ones can be improved by being involved in physical activities and, as a result, their self-perceptions will be higher than non-participating students.

Darling, Caldwell, and Smith (2005) stated that involvement in co-curricular activities result in better exam grades, less disciplinary issues, increased attendance and less dropout rate from school. The positive outcomes of co-curricular activities are not specific to athletic activities but these are also linked to other types of co-curricular activities. Olson (2008) found that those individuals who were engaged in fine arts activities had significantly improved attendance compared to those students who preferred to limit only to studies at school. Being involved in co-curricular activities is significantly related with class attendance and higher class attendance is linked with higher exam grades (Olson, 2008). The benefits of the participation in non-class room activities include better grades in class (Marsh, 1992); improved exam or test performance (Gerber, 1996); high education achievement (Hanks & Eckland, 1976); improvement in self confidence level (Marsh, 1992); higher attendance record (Mahoney & Cairns, 1997); no or little use of drugs (Cooley, Henriksen, Nelson, & Thompson, 1995); less withdrawal rate from class (Mahoney & Cairns, 1997); improved behavior (Marsh, 1992) and decreased rate of involvement in criminal activities (Landers &Landers, 1978). Yet no study has been conducted to measure whether attendance mediates the relationship of co-curricular or non-class room activities with exam

performance of students. Furthermore, there is no study as yet in Pakistan which separately and as a whole explores the relationship between participation in co-curricular activities and exam performance for male and female school students. Such a study becomes even more important in a country where women are traditionally disempowered and where emphasis on female educational development is fairly recent. Following hypotheses are developed for this study:

H_1: Attendance significantly mediates the relationship of co-curricular activities with exam performance of students.

H_2: There is significant difference in grades or exam performance of female students who participate in co-curricular activities and those who do not participate in co-curricular activities.

H_3: There is significant difference in grades or exam performance of male students who participate in co-curricular activities and those who do not participate in co-curricular activities.

H_4: There is significant difference in grades or exam performance of male and female students who do not participate in co-curricular activities.

H_5: There is significant difference in grades or exam performance of male and female students who participate in co-curricular activities.

The conceptual framework of this study is given below:

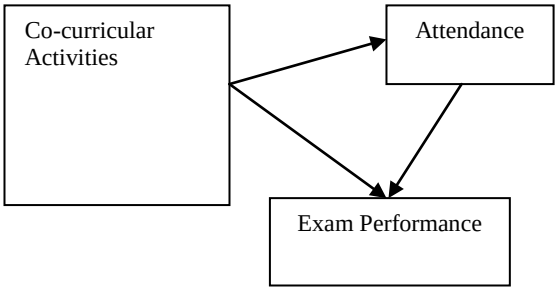

Figure 1: *Conceptual framework*

Research Methodology

Lahore city has 107 high schools owned by government of Punjab. The students who are studying at matriculation level in high schools of Lahore owned by government of Punjab constituted the population for this research. It was not possible to collect data of all students studying in high schools of Lahore city due to time and financial constraints. So, multistage purposive sampling was used to collect data from schools. Secondary data was collected from thirty schools of Lahore. The chosen thirty schools were then divided into male and female high schools (15 male and 15 female high schools). From amongst the students chosen from each school, half of the students participated in co-curricular activities and half of the students did not participate in co-curricular activities. Each school was requested to provide a list of 10^{th} year students who matriculated last year and who participated in co-curricular activities. Then an equal number of other or non-participating students were randomly selected from the roll-call registers of the same class in each school. In this way a sample of 636 students was generated. Data on average class attendance for the 10^{th} year at school was calculated from the roll-call registers. Data on 10^{th} year board exam performance for each of the selected students was also obtained from the schools.

Data Analysis

The following table is a matrix of correlation coefficients between three variables i.e. exam performance, attendance and participation in co-curricular activities.

Table: 2
Correlation matrix

	Exam Performance	Attendance	Co-curricular Activities
Exam Performance	1	---	---
Attendance	.582**	1	---
Participation Co-curricular Activities	.785**	.224**	1

** Correlation is significant at the 0.01 level (2-tailed).

Attendance and exam performance are positive correlated as Pearson correlation coefficient ($r = .582$) with significant value $p < .001$. Participation in co-curricular activities and exam performance are positively correlated with each other as Pearson correlation coefficient ($r = .785$) and significant value $p < .001$. Attendance and participation in co-curricular activities are positively correlated with each other as Pearson correlation coefficient ($r = .224$) with significant value $p < .001$.

Predicting exam performance

"Multiple linear regression" is used to analyze the effect of participation in co-curricular activities and exam performance. The following table summarized the multiple regression analysis results. Participation in co-curricular activities has statistically significantly related with exam performance of the students. Overall model explains 63.6% ($F=552$, $p < .0001$) of variance in exam performance.

Table: 3
Regression analysis of participation in co-curricular activities and exam performance

Independent Variables	B	(SE)	β
Gender	-2.019	0.342	-0.142
Participation in co-curricular activities	11.192	0.342	0.785
R^2	0.636		
Adjusted R^2	0.635		
F (Significance)	552 (.000)		

Note: Gender is statistically controlled variable

Mediating effect of attendance on exam performance

The mediating role of attendance in the presence of co-curricular activities and exam performance of students is analyzed using four step method approach (Frazier, Tix, & Barron, 2004; Baron & Kenny, 1986). Step: 1 is performed to analyze to effect of co-curricular activities on exam performance in the absence of attendance. Step: 2 is performed to analyze whether co-curricular activities is significantly linked with mediating variable attendance. During step: 3 associations between attendance and exam performance is measured. Step: 4 is performed to measure the strength of the relationship of co-curricular activities and exam performance in the presence of attendance. The following table shows results of the mediation analysis. Standardized betas have been used for regression results since units of measurement for variables in the mediation model are different from each other'. Attendance partially mediates the relationship of participation in co-curricular activities and exam performance. In step 1, ($\beta = .785$, $p < 0.001$), involvement in co-curricular activities is significantly linked with exam performance. In step 2, ($\beta = .224$, $p < 0.001$), involvement in co-curricular activities is significantly associated with attendance. In step 3, ($\beta = .594$, $p < 0.001$), exam performance is significantly associated with attendance of the students. In step 4, there is decrease in β value from .785 to .690 for the association of participation in co-curricular activities and exam performance with the addition of attendance.

Table: 4
Mediation analysis

Independent Variables	Step 1			Step 2			Step 3			Step 4		
	B	(SE)	B	B	(SE)	β	B	(SE)	β	B	(SE)	β
Gender	-2.019	0.342	-0.142	-2.429	0.293	-0.305	0.568	0.484	0.04	-0.173	0.274	-0.012
Participation in co-curricular activities	11.192	0.342	0.785	1.781	0.293	0.224	---	---	---	9.838	0.268	0.69
Attendance	---	---	---	---	---	---	1.065	0.061	0.594	0.76	0.035	0.424
R^2	0.636			143			0.34			0.79		
Adjusted R^2	0.635			141			0.338			0.789		
F (Significance)	552 (.000)			52.920 (.000)			163.192 (.000)			791.093 (.000)		

Note: In step 2, dependent variable is attendance. In step 1, 3 & 4, the dependent variable is exam performance. Gender is a controlled variable.

Significance of the mediating variable "attendance" is measured by Sobeltest through Baron and Kenny approach (Baron & Kenny, 1986). The statistics of Sobeltest of mediation $z = 5.636$, $p = 0.00$ shows that association of participation between co-curricular activities and exam performance is reduced significantly by the addition of the mediator (attendance). In other words, attendance significantly mediates the relationship of participation in co-curricular activities and exam performance. 12.1% of the variation in exam performance is explained by participation in co-curricular activities by means (mediation) of attendance.

Comparison of Mean Values

The following table shows mean of student grades in terms of exam performance and standard deviation between different groups of students. Data is divided in two categories on the basis of participation and non-participation into co-curricular or co-curricular activities. Then each group is further divided into male and female sub-groups. There is slight difference of 1.2% in their exam performance between two groups male of female students when both groups did not participate in co-curricular activities. But difference in exam performance is increased from 1.2 % to 2.84% between male and female students when both participated in participated in co-curricular activities.

Table 5
Exam performance

Extracurricular Activities	Gender	Mean	N	Std. Deviation
No Participation in co-curricular activities	Female	70.69	159	4.27
	Male	69.49	159	4.69
	Total	70.09	318	4.52
Participation in co-curricular activities	Female	82.70	159	3.78
	Male	79.86	159	4.40
	Total	81.28	318	4.33
Total	Female	76.70	318	7.24
	Male	74.68	318	6.90

Male students who were involved in co-curricular activities have 10.37% higher exam grades than male students who were not part of co-curricular activities. But female students have 12.01% higher exam grades than female students who were not part of co-curricular activities. Now, there is need to test whether difference in exam performance between different groups of students is statistically significance or not. For this purpose "independent sample t test" is used. In Levene's test of equality of variances P>.05, equality of variances for all variables is assumed. The t-test table shows that female students who were involved in co-curricular activities have statistically significant higher exam performance (82.70 ± 3.78) than female students who were not part of co-curricular activities (70.69 ± 4.27) as $p < .05$. Male students who were involved in co-curricular activities have statistically significant higher exam performance (79.86 ± 4.39) than male students who were not part of co-curricular activities (69.49 ± 4.69) as $p < .05$. Female students who were not part of co-curricular activities have statistically significant higher exam performance (70.69 ± 4.27) than male students who did not take part in co-curricular activities (69.49 ± 4.69) as $p < .05$. Female students who were involved in co-curricular activities have statistically significant higher exam performance (82.70 ± 3.78) than male students who took part in co-curricular activities (79.86 ± 4.39) as $p < .05$.

Table 6
t-test

	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	t	Sig. (2-tailed)
Exam performance of female students who participate in CA activities and those who do not participate in CA activities				
Equal variances assumed	1.821	0.178	26.552	0
Equal variances not assumed			26.552	0
Exam performance of male students who participate in CA activities and those who do not participate in CA activities				
Equal variances assumed	1.073	0.301	20.335	0
Equal variances not assumed			20.335	0
Exam performance of male and female students who do not participate in CA activities				
Equal variances assumed	1.646	0.2	-2.381	0.018
Equal variances not assumed			-2.381	0.018
Exam performance of male and female students who participate in CA activities				
Equal variances assumed	2.419	0.121	-6.174	0
Equal variances not assumed			-6.174	0

Discussion and Conclusion

Co-curricular activities help students to achieve better grades in exam and to improve their class attendance. If a student wants to participate in co-curricular activities he or she must attend the school, so absenteeism will go down. Students who participate in co-curricular activities may also enjoy different benefits other than improvement of grades and class attendance. Participation in organized co-curricular activities leads towards individual's social development and individuals have better opportunities to improve their societal attitudes and personalities. It can also provide them the opportunity to connect themselves with a social and participative network of peers if school is connected to that network (Darling, Caldwell, & Smith, 2005). Co-curricular activities have positive impact on class attendance of the students. Co-curricular activities improve the class attendance which further leads to higher performance of grades. Therefore, attendance mediates the effect of co-curricular activities on exam performance positively.

Both male and female students who were part of different co-curricular activities have better grades in exam than their non-participating counterparts, but participating female students have better grades than participating male students. It means that female students may have more chances of academic improvement by participation in co-curricular activities in comparison with male students. This may be because, although females in Pakistan have limited activities outside of home as compared with males and thus devote most of their time to studies, they experience a lower level of physical, social, emotional and psychological wellbeing attributable to participation in co-curricular activities. Thus once provided opportunities and once they participate in co-curricular activities, they perform better in exams than male students.

Proper attention should be given to co-curricular activities in schools for the betterment of all students. From a women development perspective, since female participating students have better exam grades than male participating students, so more co-curricular facilities and encouragement is required in girls' schools than is currently available. Students should be encouraged to take part in different kind of co-curricular activities and they should discover achieve their full potential. Teachers and parents and mentors should be engaged to motivate young ones to increase their involvement in co-curricular activities and proper facilities should be given at school level, especially in female schools. In-order to produce brilliant students, schools need to promote a culture of co-curricular activities.

Recommendations of the study

As co-curricular activities play a vital role in the success of exam performance, these activities must be aligned and scheduled with the daily routine of coursework of the students in such a way that involvement in these activities does not interfere with their classroom presence. Involvement in at least some co-curricular activities must be made a part of the syllabus of the schools. Students should be encouraged to participate in co-curricular activities in schools and different sessions should be arranged for the awareness of parents and society. It should be mandatory for every school to arrange co-curricular activities for students. Female participation in co-curricular activities should be made a part of women development agenda at the national and provincial levels.

Directions for Future Research

The research study was only intended to explore the role of co-curricular activities and exam score or grades in the presence of class attendance. There may be other factors which may interfere with students' participation in curricular or co-curricular activities. Some students' might have financial issues, so they may invest their free time to finance

themselves and to support their families and hence find little time for both curricular and co-curricular activities. Some schools may have financial problems. Further research is required to explore how these factors affect students' participation in co-curricular activities and what steps should be taken to remove these barriers.

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