THE CORRELATION BETWEEN PRESENCE AND AVERAGE MEANS SCORE IN INTERMEDIATE OF MATHEMATICS CLASS

Naeem Kausar
Assistant Professor, Higher Education Department, Government of Punjab
Corresponding Author: naeemkousar786@gmail.com
&
Mehran Hussain
Assistant Research Officer, Planning and Evaluation Cell, Agriculture Department, Lahore, Government of Punjab

Abstract

The current study is about finding a correlation between presence and average means score in intermediate mathematics class in Punjab. The study is bases upon quantitative approach and analysis. The percentage of attending the lectures were statistically correlated to the average means score of students, in a compulsory subject of Mathematics for intermediate pre-engineering class of female college. Attendance was recorded in four consecutive terms through attendance sheets prepared by subject teacher of Mathematics, with an average 96.47% of students. Average means scores of four attendance groups were computed. The data were analyzed by ANOVA and regression analysis. A strong correlation between percentage of presence and average means score was shown through the analysis.

Key Words: Attendance, Pre-Engineering Class, Average Means Score.

INTRODUCTION

Is the marks of a student correlated by the attendance of receiving the lecture? The answer of this question is discussed here in this study by recording and analyzing the data from attendance and marks sheets prepared by the Incharge class and subject teacher of class respectively. If this study showed that final results of terms were not related to attendance, it would help the view of principal who opposed requiring attendance as a matter of principle: it would mean that, at least for the case studied here, students attending class did not perform differently from their peers staying home or bunk their lecture. However, the opposite consequence of this study – displays a strong link between attendance and marks of students.

The connection between attendance and academic achievement has been the subject of many studies in a wide variety of courses such as Japanese Culture (Gump, 2005), Economics (Marburger, 2001; Romer, 1993; Durden and Ellis, 1995)), Psychology (Van Blerkom, 1990), and Child Development (Hovell et al., 1979). Academic achievement has been measured by their ability to correctly answer questions in optional quizzes (e.g., Marburger, 2001; Schmidt, 1983, Clump et al., 2003), or directly from their course grades (e.g., Romer, 1993). The conclusion of this study is also consistent with these.

Although many of the studies discuss the importance of attendance in favor or against requiring students to get achievement of students in form of marks. But this study is unbiased about the merits of requiring attendance, the author includes a brief reflection on the importance of this topic in the Conclusions of this paper

OBJECTIVES OF THE STUDY

This paper discusses the results of examination of girls achieved during 2014-2016 session. During this period, attendance was recorded from their class registers, marked by the relevant teachers at lecture time. The objective of this research is, to seek the significance of correlation between attendance and final marks of students in mathematics course.

BACKGROUND: THE COURSE AND ITS STUDENTS

Mathematics of Punjab textbook board was taught to students in an intermediate college in Divisional Public College Faisalabad, Pakistan. There were five lectures of Mathematics per week. There were two terms of examination after about six months. First term examination was conducted in December 2014. The final term was conducted in May 2015. The first term was managed by the college administration of college (home examination). The final term was occupied by the intermediate board of Faisalabad. The final marks obtained by the students (girls) were recorded through the marks sheet prepared by the lecturer, incharge of the section. The records of attendance as well of marks sheets were also checked by the assistant of controller of examination of the college. Three sections were enrolled in this session of two years. The students were only allowed to appear in examination in case of attaining attendance of the lectures more than 80%. The level of acquiring attendance was set by the higher

authority of the college. The attendance has several challenges, as the subject (mathematics) is supposed somewhat dryer than other subjects. Some students are used to bunk the class during mathematics class. Some students found problem for developing rapport with teacher and started to take couching at home. The total student's baseline information is given in Table-1.

Table 1: General Sampling Information

Terms	Students	Lectures sampled (total)	Lectures sampled %age	Average Mean Score
Mid14	**117**	**30(88)**	**34.09**	**75.8**
Annual14	**118**	**11(59)**	**18.86**	**82.3**
Mid15	**121**	**14(80)**	**17.5**	**64.4**
Annual15	**123**	**21(64)**	**32.81**	**71.7**

METHODOLOGY

The attendance of students means the presence of student during the class of relevant subject. It shows the physical appearance of students. The attendance of each term was recorded through attendance sheet of considered subject teacher at the end of each term. The samples of some particular days or weeks during no extra activities going on and non-before the days of vacations were drawn. As these dates were not random, nonrandom sampling was used to take the sample of students for recording their attendance and subject marks for each term. The period was from 2014 to 2015 for complete one session of two years.

The attendance was ranged in four groups for statistical analysis. i.e. 0 to < 40%, 40% to <60%, 60% to < 80% and 80% to 100%. The alternative group of two ranges from 0 to <60% and 60% to 100% was also considered for analysis.

The average mean score for some considered range of students was simple arithmetic mean of marks obtained by the students at the end of term consisting six months. The effect of the attendance in their marks was not being considered.

The statistical analysis is focused on single factor analysis of variance to examine the correlation between attendance and average mean scores of students. The Statistical Analysis Package in MS Excel was used for all calculations.

RESULTS

Attendance

Attendance of intermediate classes of mathematics for three sections of 479 students was recorded at the end of session 2014-2015. The strength was varied among sections. Table 2 represents the complete attendance information data. The overall attendance was 96.50%.

Average mean score

The Table 3 presents the overall and corresponding average mean score of students within the ranges of attendance. The average mean scores were averaged as per total number of students. The Figure 2 also shows the average mean score graph. While Table 4 shows the average means score per grouping of present students of two groups i.e. 0 to <60% and 60% to 100%.

Table 2: Attendance Tally

Terms	Students	Number Of possible Attendance	Number Of Attendance	%age of number of attendance
Mid14	**117**	**1755**	**1701**	**96.92**
Annual14	**118**	**1298**	**1255**	**96.68**
Mid15	**121**	**1694**	**1619**	**95.57**
Annual15	**123**	**2583**	**2499**	**96.74**

Table 3: Average Mean Score Tally

Terms	Students	Lectures sampled(total)	Lectures sampled %age	Average Mean Score
Mid14	**117**	**30(88)**	**34.09**	**75.8**
Annual14	**118**	**11(59)**	**18.86**	**82.3**
Mid15	**121**	**14(80)**	**17.5**	**64.4**
Annual15	**123**	**21(64)**	**32.81**	**71.7**

Figure 1 shows the overall frequency distribution for the number of attendance. Only 3.5% students were absent in overall attendance frequency distribution. This figure does not show any trend, but figure 2 shows upward trend of attendance from midterm to annual examination. The students were inclined to be present before annual examination instead of before midterm.

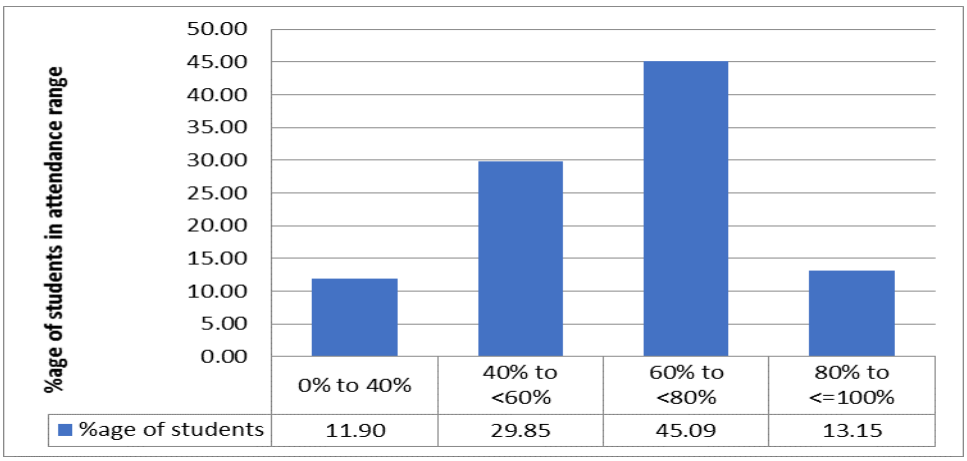


Figure 1: Overall Attendance Frequency Distribution

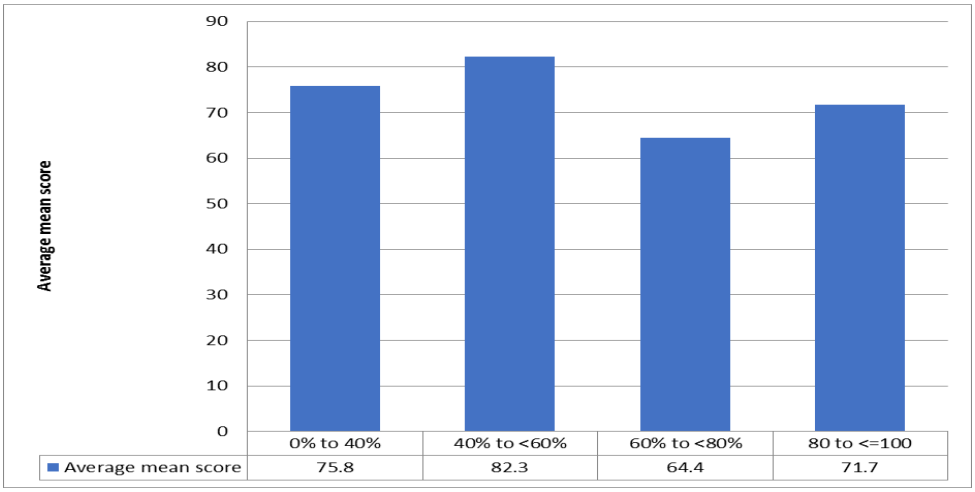


Figure 2: Overall average mean score Frequency Distribution

Table 4: Alternative average mean score Grouping

Terms	**0 to <60%** **average mean score**	**60% to <=100% average mean score**
Mid term14	**54** **63.05**	**63** **85.45**
Annual term14	**38** **62.7**	**80** **90.3**
Mid term15	**52** **62.35**	**69** **66.45**
Annual15	**56** **67.35**	**67** **76.5**

Detailed grade averages

Table 5 shows the distribution of average means score against the number of recorded presence for each student. This table is relevant in that, it summarizes the data used for the regression analysis discussed below.

Table 5: Detailed attendance Distribution

Terms	Mid14 Students(%age)	Annual14 Student (%age)	Mid15 Students (%age)	Annual15 Students (%age)	%age of attendance
0 to 40%	15(13%)	9(8%)	11(9%)	22(18%)	11.90
40% to <6%	39(33%)	29(25%)	41(34%)	34(28%)	29.85
60% to <8%	55(47%)	67(57%)	49(40%)	45(37%)	45.09
80% to <=100%	8(7%)	13(11%)	20(17%)	22(18%)	13.15
	117	118	121	123	100

Table 6: Detailed Average mean score Distribution

Attendance	0to 40%	40%to<60%	60%to<80%	80%to<=100%	total
Mid14	66.5	59.6	52.9	80.0	64.75
Annual14	59.6	65.8	80.4	89.7	73.87
Mid15	45.9	78.8	90.9	90.5	76.52
Annual15	69.6	65.1	70.8	81.3	71.7

At 95% confidence level, the ANOVA failed to prove the hypothesis that there was the s average mean score same from midterm to final or annual term. The p-value 0.038376 exhibits the significance of overall average mean score for each term. However, on further study, an

ANOVA with the alternative grouping shown in Table 4. The analysis for alternative grouping 0 to <60% and 60% to 100% ANOVA presented in Table7 shows that result of the hypothesis is significant for the 60% to 100% range of attendance. Whereas the p=0.221 of ANOVA for 0 to 60% proved the null hypothesis at 95 % confidence level.

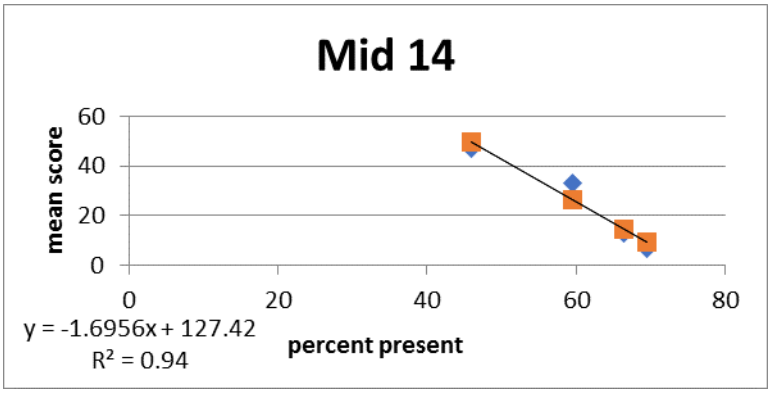
Table 7: ANOVA Summary for Alternative Grouping of average means score

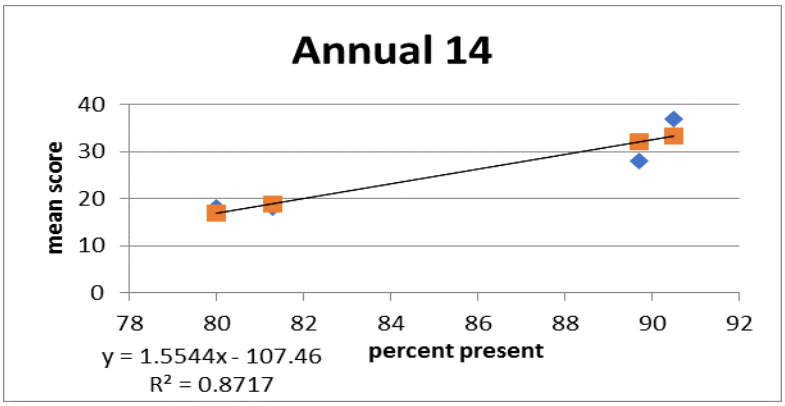
SUMMARY						
Groups	***Count***	***Sum***	***Average***	***Variance***		
0 to <40%	**4**	**241.6**	**60.4**	**110.913**		
40% to <60%	**4**	**269.3**	**67.325**	**66.2091**		
60% to <80%	**4**	**295**	**73.75**	**260.59**		
80% to<=100%	**4**	**341.5**	**85.375**	**30.1558**		
ANOVA						
Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F-crit***
0 to <60%						
Between						
Groups	**500.07**	**1**	**500.07**	**8.629**	**0.0260**	**5.987**
Within						
Groups	**347.68**	**6**	**57.94**			
Total	**847.75**	**7**				
<=60% to 100%						
Between						
Groups	**270.28**	**1**	**270.28**	**1.8592**	**0.2216**	**5.987**
Within						
Groups	**872.23**	**6**	**145.37**			
Total	**1142.51**	**7**				

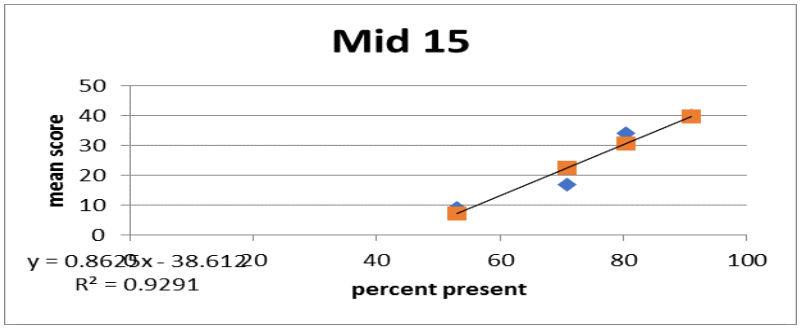
REGRESSION ANALYSIS

Figure 3 plots average mean score as a function of the number of presence (attendance) for each term, with a linear regression analysis. Each graph includes the results of a linear regression analysis, namely the corresponding equation for the least squares line and their respective coefficient of determination (R^2). This coefficient is a measure of the power of the regression model. In all cases, there was a positive correlation between mean score and presence: the higher the number of presence, the higher the corresponding mean score.

The ANOVA presented in Table 7 shows that there was consistency from term to term in the number of students that missed between 0 and 40% of class lectures. In contrast, students missing more lectures varied to the point that the ANOVA could not prove that they were comparable among terminal examination. This pattern is consistent with the results of Durden and Ellis (1995) who found that a relatively small number of absences (4 or less in their study) did not affect academic performance significantly. The lack of correlation among term average mean score for students with a higher percentage of presence can be inferred from studying the available data. It can be ventured that since students showing regularly to class tend to have better marks than those with inclination to miss class, the higher-mean score students may have habits that are more regular and discipline than those with lower marks.


Mid 14
mean score
60
40
20
0
0
20
40
60
80
y = -1.6956x + 127.42
R² = 0.94
percent present


Annual 14
mean score
40
30
20
10
0
78
80
82
84
86
88
90
92
y = 1.5544x - 107.46
R² = 0.8717
percent present



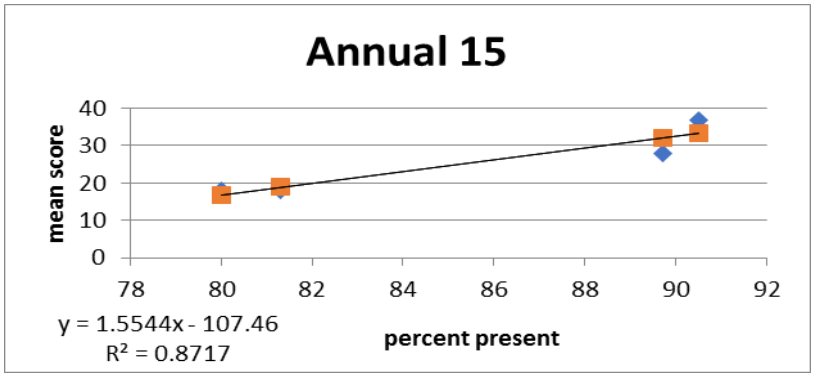


Figure 3: Scatter Diagrams of attendance vs. average mean score

CONCLUSIONS

It is concluded that the students likely to attend class were more likely to get good marks. There could be many other similar factors affecting both the number of attendance or presence and mean score. In other words, the effect of student absenteeism on a class is a contentious and important topic for college instructors. Compulsory class attendance is viewed by some instructors as an intrusion on students' right to decide their destiny. Moreover, a frequent reason considered for advocating against compulsory attendance is the Darwinian nature of students failing to show up to a particular class. Poor instructors are, in this view, cleared out from the system by the dramatic effect of an empty classroom. The opposite perception in the attendance enigma is that the college-level instruction experience cannot be replaced by the simple reading of books or leaflets. Students failing to attend class regularly disorder group projects, and cannot ask questions to clarify

reservations about any particular topic. This view also considers the importance of instilling students with a level of responsibility. It follows that the responsibility to show up for class is as important as a student's capability to make a project timetable, if the benefits of a college education include the simulation of real-life, professional problems.

Under the seemingly simple surface of this topic, providing an objective answer to the appropriateness of necessitating class attendance may be an impossible hunt. Since it has many principles and moral issues loitering just. However, the more objective question of whether attending class results in a better understanding of its content could and should be answered. The present study, as well as many others, shows that these two academic issues are related. The important task of researching whether one is a significant reason explaining the behavior of the other, further studies should begin with the premise that this correlation exists, and proceed to the belligerent.

REFERENCES

Berenson, S., Carter, G. and Norwood, K. (1992). The at-risk student in college developmental algebra. School *Science and Mathematics*, 92, 55-58.

Clump, M., Bauer, H. and Whiteleather, A. (2003). To attend or not to attend: Is that a good question? *Journal of Instructional Psychology*, 30 (3), 220-224.

Devadoss, S. and Foltz, J. (1996). Evaluation of Factors Influencing Student Class Attendance and Performance. *American Journal of Agricultural Economics*, 78 (3), 499-507.

Durden, G. and Ellis, L. (1995). The effects of attendance on student learning in principles of economics. *The American Economic Review*, 85 (2), 343-346.

Friedman, P., Rodriguez, F. and McComb, J. (2001). Why students do and do not attend classes: Myths and realities. *College Teaching*, 49, 124–33.

Gump, S. (2005). The cost of cutting class: attendance as a predictor of student success. *College Teaching*, 53 (1), 21-26.

Hovell, M., Williams, R. and Semb, G. (1979). Analysis of undergraduates' attendance at class meetings with and without grade-related contingencies: A contrast effect. *Journal of Educational Research*, 73, 50-53.

Hyde, R. and Flournoy, D. (1986). A case against mandatory lecture attendance. *Journal of Medical Education*, 61 (1), 175-176.

Koppenhaver, G. (2006). Absent and Accounted For: Absenteeism and Cooperative Learning. *Decision Sciences Journal of Innovative Education*, 4 (1), 29-49.

Launius, M. H. 1997. College student attendance: Attitudes and academic performance. *College Student Journal* 31, 86–92.