Effect of Absenteeism on Student Performance in a Construction Science Course

Abstract

Student absenteeism is an important issue for educators at colleges and universities. The purpose of the study was to determine the effect of absenteeism on overall student performance in a construction science course taught by the author at a university in Bangladesh. Data was collected from a classroom situation. A General Linear Model technique was utilized to examine the relationship between absenteeism and the final student grade for the course. Other factors that may have an effect on overall student grade in a course, such as homework performance, quiz performance, and gender of a student, were also included in the model in order to find out whether absenteeism continued to have a significant effect on the dependent variable in the presence of the other variables. While the model explained 90 percent of the variance in final test performance, only absenteeism and quiz performance were found to have a statistically significant effect on the dependent variable. The study provides strong empirical evidence of the positive influence of class attendance on student performance.

Key words: Absenteeism, Bangladesh, Construction Science, Gender, Homework, Quiz, Student Performance

Introduction

“In college classrooms throughout the country, seats are empty. Although students have paid large amounts of money to enroll in courses that they must pass to graduate from college, many students do not attend class regularly” (Moore, 2005, p. 26). Student absenteeism is an important issue in institutes of higher learning here in the US. Class attendances, at least in practice, are optional in most schools. Although instructors have different outlook and policies toward attendance, most of them would like them to attend the classes to maintain a vibrant teaching-learning atmosphere.

The author encountered a similar situation at a university in Bangladesh while offering a course on materials and methods of construction in the spring semester of 2005. Students of construction science are required to take one or more courses dealing with building materials and methods of construction in their freshmen or sophomore year. Students completing these courses are supposed to be familiar with the inherent physical and structural properties of these materials and methods employed for construction.

Even though most of the students were enthusiastic about the class, it was observed that some students did not attend all the class meetings. Since the university did not have a clear cut policy toward class attendance, no penalty was imposed for being absent from the class.

Lecture and class room discussion represented the primary means of teaching the course. Since the course was related specifically to the construction industry in Bangladesh, it
was difficult to use a particular textbook. Written notes on different topics were given to the students. Contents of the notes were explained in details during class meetings, both by means of lectures and visual aids. Students were encouraged to ask questions and participate in discussions on the course topics. Even though people in Bangladesh speak Bangla, the medium of instruction in this particular university was English.

Studies in the US reveal that there is a relationship between absenteeism and student performance in courses (Brocato, 1989; Moore, 2005). The purpose of this study was to determine whether absenteeism had an effect on final student grade for this particular course offered in Bangladesh. It was hypothesized that absenteeism is inversely correlated with overall student performance in a materials and methods of construction course offered at a Bangladesh university.

**Methodology**

**Study Population**

The study population consists of students who registered for the materials and methods of construction course offered by the author at the particular university in Bangladesh and attended the course in the spring semester of 2005. The sample size includes the total population of 34 students enrolled for the course. The unit of analysis is the student.

**Data Collection**

In order to determine whether absence from class meetings affects student grade in a course in the presence of other possible predictors of student performance, factors related to gender and performance in home works and quizzes were also taken into consideration to test the hypothesis.

Data related to the study was collected by the author from his own records. Class attendance was recorded at every class meeting. All home works, quizzes, and tests covered materials presented in the class and the written handouts. Students could make a perfect score for all these measures of performance if they read and understood the materials.

**Variables and their Operationalization**

*Overall Student Performance (GRADE)*. It is the actual overall student performance by the student in the class. It was measured by the numerical grade obtained by the student in the final test at the end of the semester.

*Absent (ABSENT)*. It is the record indicating the complete absence of the student from class meetings. It was measured in number of class meetings missed by the student.

*Gender (GENDER)*. It indicates the gender of a student. It was a class variable consisting of two categories, female (FEMALE) and male (MALE).
**Home Work (HW).** It is the performance by the student for a particular assignment related to a topic covered by the course and done at home. It was measured by the cumulative numerical grade obtained by the student in all home works.

**Quiz (QUIZ).** It is the performance by a student in a short, previously unannounced, test held in the class related a particular course topic. It was measured by the cumulative numerical grade obtained by the student in all quizzes.

### Analysis and Results

#### Analysis

A General Linear Model was used for the analysis because of the presence of one class variable. Following model was used for the purpose:

\[
\text{GRADE} = \beta_0 + \beta_1 \text{ABSENT} + \beta_2 \text{GENDER} + \beta_3 \text{HW} + \beta_4 \text{QUIZ}
\]  

(1)

where \( \text{GRADE} \) = overall student performance in terms of numerical grade, \( \text{ABSENT} \) = number of class meetings missed by a student, \( \text{HW} \) = cumulative numerical grade obtained by the student in all home works, \( \text{QUIZ} \) = cumulative numerical grade obtained by the student in all quizzes, \( \beta_0 \) = intercept, \( \beta_1 \) = the coefficient of ABSENT, \( \beta_2 \) = the coefficient of GENDER, \( \beta_3 \) = the coefficient of HW, and \( \beta_4 \) = the coefficient of QUIZ.

#### Results

The results of the analysis are shown in Table 1.

| Variable | Intercept | Regression Coefficient | T   | p<|T| |
|----------|-----------|------------------------|-----|-----|
| Intercept| 57.033    |                        | 4.116 | 0.000 |
| ABSENT   | -4.901    | -7.052                 | 0.000 |
| GENDER   |           |                        |      |      |
| FEMALE   | 0.507     | 0.227                  | 0.822 |
| MALE     | 0         |                        |      |      |
| HW       |           | 0.606                  | 1.135 | 0.266 |
| QUIZ     |           | 1.465                  | 2.464 | 0.020 |

F-value of the Model: 32.076  
\( p > \text{Model F} = 0.0001 \)  
Model R2 = 0.91  
Adjusted model R2 = 0.90
The results indicated that overall student performance in a materials and methods of construction course offered at a Bangladesh university is negatively related to absenteeism measured by the total number of days a student missed class meetings at the level of significance of less than 0.0001. Performance in quizzes also had an effect on overall performance at the level of significance of 0.02. Gender and performance in home works did not have any effect on the dependent variable. The results implied that the final grade of a student would decrease by 4.937 points for every absence from class meetings. The final grade would increase by 1.465 for every point earned for the quizzes.

Figure 1. Relationship between GRADE and ABSENT

The F statistic of a model basically tests how well the model, as a whole, accounts for the dependent variable's behavior. The F-value of this particular model was found to be statistically significant at less than the 0.0001 level.

An important aspect of a statistical procedure that derives model from empirical data is to indicate how well the model predicts results. A widely used measure of the predictive efficacy of a model is its coefficient of determination or $R^2$-value. If there is a perfect relationship between dependent and predictor variables, $R^2$ is 1. In case of no relationship between dependent and predictor variables, $R^2$ is 0. Predictive efficacy of this particular model was found to be quite high. Absenteeism and quiz performance explained 90 per cent of the variance.

Discussions

The results of the statistical analysis indicated that students having a higher number of absences from class tend to perform poorly in material and methods of construction course offered at a university level in Bangladesh. Studies on education done by other researchers (Devadoss & Foltz, 1996; Kennedy, 2001) provide strong support to this
empirical finding. A poor performance in the quizzes indicates an inadequate understanding of the materials discussed in the class. It eventually affected a student’s overall performance in the course.

Conclusions

Based on the empirical data, a mathematical model has been developed to predict student performance in a course on materials and methods of construction offered at a university level in Bangladesh. The model as a whole accounts quite well for the behavior of the dependent variable of overall student performance. This is evident from the high F-value of the model that is statistically significant at the 0.0001 level. The predictive efficacy of the model is quite high with an adjusted $R^2$-value of 0.90. It could be useful as a tool for identifying predicted poor performers in such a course. The process would enable the instructors to take remedial measures at an earlier stage to provide additional help to the groups at risk by find ways to attract them to the class meetings. The study will hopefully generate enough interest to do further research for deriving models for predicting student performance in other courses.

Bibliography


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