IMPACT: International Journal of Research in Business Management (IMPACT: IJRBM)
ISSN(E): 2321-886X; ISSN(P): 2347-4572
Vol. 2, Issue 5, May 2014, 73-78

LECTURE ATTENDANCE AND SUCCEE ON GENERAL MATHEMATICS. CASE STUDY OF FIRST-YEAR BUSINESS STUDENTS, UNIVERSITY OF TIRANA, ALBANIA

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ABSTRACT

The lecture remains at the centre of most universities approaches to teaching and learning, despite the emphasis on quality and flexibility, and the introduction of new technologies. But, lecturers increasingly face very low levels of lecture attendance. Concern for improvements in student learning has attracted a large amount of literature in search for the correlation of class attendance and student performance. The majority of these studies show that students attending classes perform better on assessment than those skipping lectures. Class attendance has been shown to be correlated with grades across a wide range of disciplines. The aim of this research is to analyze the business student's attendance in general mathematics lectures and their final examination success. The population of the study consists of business students attending first-year at the Faculty of Economy, University of Tirana for 2012-2013 academic year. Using the simple random sampling, 143 students are randomly selected and completed a survey during the first week of June. The logistic regression is used to estimate the impact of lecture attendance on final success. The results indicate that lecture attendance of business students has a statistically significant impact on their final success in General Mathematics course. These findings suggest that enhancing student participation should be a crucial aspect of administration, in order to improve performance. At the same time, the lecturer should also create a good learning environment, to motivate students and engage their interest in the course.

KEYWORDS: General Mathematics, Attendance, Success, Binary Logistic Regression, Albania

INTRODUCTION

One of the benefits of good education is that it enables individuals to contribute to the development and improvement in the quality of life for themselves, their communities and the nation as a whole. Student's achievements in mathematics in high school are prerequisites for admission into university and have a significant effect on their academic performance in university. Also, mathematical and quantitative skills create possibility for better chances of employability, higher wages and higher on-the-job productivity. Therefore, mathematics learning and student's performance in mathematics receive considerable attention from educators, teachers and parents and is important to identify the factors that could influence student's mathematics achievement to help them improve and make substantial academic progress. Concern for improvements in student learning has attracted a large amount of literature, and many studies show that students attending classes perform better on assessment. Despite the emphasis on quality and flexibility, and the introduction of new technologies, the lecture remains at the centre of most universities approaches to teaching and learning. But, lecturers increasingly face very low levels of lecture attendance. It is commonly assumed that university students benefit from attending lectures. A number of studies have examined the relationship between student's attendance and academic performance, generally finding that attendance does matter for academic achievement

(Kirby and McElroy, 2003; Rodgers, 2001). This kind of evidence has led some authors to call for measures to increase student attendance and even to consider the possibility of making attendance mandatory in some courses. A number of studies have shown that there is a strong link between mathematical background and performance in Economics and Finance units, and hence overall performance in the degree. Lagerlof and Seltzer (2007) concluded that the level of and performance in secondary school mathematics has strong predictive power on a student's performance at university level economics. Butler et al. (1994) studied the effect of Calculus on learning intermediate microeconomics and macroeconomics and found a positive and significant association between intermediate microeconomics, but failed to establish the relationship with macroeconomics. Using data from an Australian University, Mallik and Lodewijks (2010) found that higher level mathematics (with calculus) and economics in high school can increase the marks in first year introductory economics subject significantly.

Socio demographic factors such as age, income, gender, psychological factors such as motivation, stress, study strategies, and other factors like study hours and understanding the language of instruction are among the factors that could play substantial roles in student's academic success.

The objective of this study is to assess the impact of lecture attendance on final outcome in General Mathematics course for first-year business students.

LITERATURE REVIEW

Lectures are a central element of traditional university learning, but lecturers increasingly face very low levels of lecture attendance. Estimates of lecture attendance by researchers range from as little as 7% (Massingham & Herrington, 2006) to approximately 70% (Massingham & Herrington, 2006; Purcell, 2007). The majority of research into lecture attendance focuses on the reasons students do not attend lectures, assuming that reversing such conditions might increase attendance (Friedman, Rodriguez & McComb, 2001; Massingham & Herrington, 2006). The literature suggests many possible reasons including student's changing lifestyle, attitudes, teaching and technology (Dolnicar et al., 2009). Poor quality lecturing is one of the most common reasons cited for non-attendance at lectures. In response, research highlights the need to enhance the pedagogical skills of lecturers; and Massingham and Herrington (2006), suggest that today's students require a more student-centered approach.

Factors that may influence whether or not students attend lectures are: compulsory status of subjects they are enrolled in, the amount of support materials provided outside the lecture that may give the perception that attending the lecture is not necessary, assessment of the quality of the lecturer, quality of the student, perceived difficulty of the subject, logistics of subject delivery, accessibility of the university, and other commitments (Dolnicar et al., 2009). It has been repeatedly shown that there exists a statistically significant relationship between lecture attendance and grades across a wide range of disciplines. Gatherer and Manning (1998) suggest that there is a statistically significant weakly positive correlation between lecture attendance and examination performance for a first year biological sciences student cohort. Lockwood *et al.* (2006) analyze if compulsory attendance would improve student grades and suggest that there is a statistically significant strongly positive correlation between lecture attendance and exam performance for agricultural science students, though the student year on the programme is unclear. Purcell (2007) finds a relationship between lecture attendance and examination performance for a second year and a third year cohort of civil engineering students at University College Dublin, reporting that the mean attendance rate is 68%. However, engineering student attendance rates

can be low; Kolari *et al*. (2008) reference studies at a Finnish university suggesting that engineering students are present at 39% of their lectures. Maloney and Lally (1998) suggest that there is a statistically significant weakly positive correlation between lecture attendance and examination performance for a third year economics student cohort at University College Galway.

The findings of Cohen and Johnson (2006), indicate a strong positive correlation between attendance and academic performance in a sample of 347 economics students. Kirby and McElroy (2003) in their analysis on a sample of first year economics students examined the relationship between attendace and grade and found that the average attendance rate is 47%. In a recent study, Alija (2013) using binary logistic regression found that first, second and third-year students at the Faculty of Business and Economics, at South East European University in Tetovo that attend the lecture of the Business Matematics, Statistics and Managerial Economics courses have more chances to receive passing grades.

METHODS

The study population consists of business students in the 2012-13 academic year attending first-year at the Faculty of Economy, at University of Tirana. In 2012-2013 academic year, 450 business students attended the first year, separated in 13 classes. Using the simple random sampling, 143 students are randomly selected and completed a survey at the last week of the second semester.

Two main variables of the study are lecture attendance and mathematics grade. The variable lecture attendance is obtained by the questionnaire; the students were asked the number of lectures (weeks) that they have attended during the semester (15 lectures/weeks). The other variable is the grade, which is obtained by the lecturers of the General Mathematics course. Two other dummy variables used during the analysis are: study hours coded 1 if a student spent averagely more than 5 hours learning mathematics during the weeks of the semester and 0 otherwise, and average grade in mathematics in high school coded 1 if the average grade was more than 8 and 0 otherwise. STATA was used to perform descriptive analysis and logistic regression analysis.

Logistic Regression Model

A dichotomous response of success or failure is modeled. Success is defined as earning a final grade of 5 or higher in the mathematics course. Students who received a final grade of 4 are considered to have been unsuccessful. For the analysis, the response is coded as 1 or 0, respectively.

Logistic regression is recommended over linear regression when modeling dichotomous responses and allows the researcher to estimate probabilities of the response occurring (Lemeshow and Hosmer, 2004). The logistic regression equation takes the following form.

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k$$

The estimated probability of the response occurring (p) divided by the probability of it not occurring (1-p) is called the odds ratio. Maximum likelihood method is used to estimate the odds of the model. Values of odds ratios higher than 1 indicate positive association between variables, odds ratios equal to 1 indicate no association and odds ratio lower than 1 indicate negative association between variables of the model.

RESULTS AND DISCUSSIONS

Majority of the students in the sample are females (89%), have attended an urban high school (91%) and a public high school (89%). Around 38% of students spend more than 5 hours every week using computer, mostly for projects, home-works, and social networks. Also only 14% of them spend time working during the week. Family average income is 62700 leks in month. About 60% of the students passed the final exam.

Pearson correlation coefficient for mathematics lecture attendence and final grade was r = 0.24 and significant for 5% level (p-value = 0.004).

The results of logistic regression indicate a value of LR chi2(1) statistics 8.91, so the model is statistically significant (p-value < 0.001).

Table 1: Results of Logistic Regression Model 1

Independent Variable	Odds Ratio	z-value	p-value
Lecture attendance			
More than 10 lectures	4.16	2.71	0.007
10 or less lectures	1.00		

Results indicate that the variable lecture attendance is statistically significant, and that students attending more than 10 lectures are more likely (OR = 4.16) to receive a passing grade.

When we add two other dummy variables in the model 1, study hours and average grade in mathematics in high school, the results of logistic regression model 2 indicate a LR chi2(3) value of 16.81, so the model 2 is statistically significant (p-value < 0.001).

Table 2: Results of Logistic Regression Model 2

Independent Variable	Odds Ratio	z-Value	p-Value
Lecture attendance during the semester			
More than 10 lectures	3.03	2.01	0.045
10 or less lectures	1.00		
Average study hours during the weeks of the semester			
More than 5 hours	2.02	1.84	0.065
Five or less hours	1.00		
Average grade in mathematics in high school			
More than 8	2.68	2.02	0.043
Eight or less	1.00		

Results of the model 2 indicate that the variable lecture attendance is statistically significant at 5% level, that is students attending more than 10 lectures are more likely (OR = 3.03) to receive a passing grade in General Mathematics, when other variables remain constant. The other variable, average grade in mathematics in high school is significant at 5% level, indicating that a student with average more than 8 in high school are more likely (OR = 2.68) to pass the exam than a student with average lower than 8. The variable study hours is significant at 10% level, indicating that students that spend in average more than 5 hours to study mathematics during the weeks of the semester have more chances (OR = 2.02) to pass the final exam.

We can conclude that General Mathematics lecture attendance; mathematics study hours during the weeks and average grade in mathematics in high school have significant impact on final success of first-year business students.

CONCLUSIONS AND RECOMMENDATIONS

The importance of mathematics is well recognized for admission into university and to finish successfully the university studies. Hence, it is important to identify some of the factors that influence the performance of student in mathematics in order to help them improve and make progress. The results indicate that business students lecture attendance has a statistically significant impact on their final success in General Mathematics course. There exist a statistically significant weakly positive correlation between lecture attendance and final success. The results of binary logistic regression indicated that lecture attendance, study hours and average grades in high school are statistically significant independent variables. Students who attend more than 10 lectures, study mathematics more than 5 hours during the weeks of the semester and had average in mathematics in high school more than 8, have more chances to pass the final exam. Based on these findings we suggest that enhancing student participation should be a crucial aspect of administration, in order to improve performance. Also, the lecturer should create a good learning environment, to motivate students and engage their interest in the course. Since there is a significant relationship between attendance and class performance, as confirmed by the literature, the clear challenge to educators is to identify and implement measures that will increase class attendance. Based on their empirical findings, Devadoss and FoltzSource (1996) have offered for instructors, advisors, and departments the following suggestions as strategies to increase attendance and enhance student performance:

- At the beginning of the semester, students should be informed of the empirical relationship between class attendance and performance.
- To encourage attendance, instructors may assign a certain percentage of the total marks to lecture attendance.
- Should be created a learning environment which promotes opportunities for student interaction and critical thinking. One approach to increase student participation is to provide incentives, such as giving a small number of bonus points for answering a critical question during the lecture.
- Results indicate that supplemental materials in addition to the textbook improve student performance. Also, providing additional in-sights, discussion, and real-world examples helps to enhance the understanding of the subject matter.
- Findings suggest that classes scheduled between 10 a.m. and 3 p.m. have better attendance. Thus, scheduling classes, particularly core or required courses, during these hours is strongly recommended.
- Excessive financial stress and working odd jobs negatively affect student's academic performance. Students need to be counseled to attempt to find work related to their studies or to seek financial aid to alleviate their financial burden.

In their future work, the authors will study the impact of general mathematics success to microeconomics success and foundation of finance success of first-year business students.

REFERENCES

1. Alija, S. 2013: How attendance affects the general success of the student, *International Journal of Academic Research in Business and Social Sciences, Vol. 3, No. 1.*

2. Butler, J.S., Aldrich, T. & Siegfried, J.J. 1994: 'Does More Calculus Improve Student Learning in Intermediate Micro and Macro Economic Theory?' *American Economic Review*, 84(2), pp. 206-210.
3. Devadoss S. & FoltzSource, J. 1996: Evaluation of Factors Influencing Student Class Attendance and Performance. *American Journal of Agricultural Economics*, Vol. 78, No. 3 (Aug., 1996), pp. 499-507.
4. Dolnicar S., Kaiser, S., Matus, K. & Vialle, W. 2009: Can Australian universities take measures to increase the lecture attendance of Marketing students? *Journal of Marketing Education*, 31 (3), 203-211.
5. Friedman, P., Rodriguez, F., & McComb, J. 2001: Why students do and do not attend classes: Myths and realities. *College Teaching*, *49*(4), 124-134.
6. Gatherer D. & Manning F.C.R. 1998: Correlation of examination performance with lecture attendance: A comparative study of first-year biological sciences undergraduates, *Biochemical Education*, Vol. 26, pp. 121-123.
7. Hosmer D.W. & Lemeshow S. (2004). *Applied Logistic Regression*, 2nd ed.
8. Kirby A. & McElroy, B. 2003: The effect of attendance on grade for first year economics students in University College Cork, *The Economic and Social Review*, Vol. 34, No. 3, Winter 2003, pp. 311-326.
9. Kolari S., Savander-Ranne C. & Viskari E-L. 2008: Learning needs time and effort: a time-use study of engineering students, *European Journal of Engineering Education*, Vol. 33, No. 5/6, 2008, pp. 483-498.
10. Lagerlof, J. N. M. & Seltzer, A. J. 2007: The Effects of Remedial Mathematics on the Learning of Economics: A Natural Experiment, available at http://papers.johanlagerlof.org/Foundations-final.pdf, (accessed June, 2013).
11. Lockwood P., Guppy C. & Smyth R. 2006: Should lectures be compulsory?, *Proceedings of the UniServe Science Assessment Symposium*, Sydney, Australia. Available at http://science.uniserve.edu.au/pubs/procs/2006/lockwood.pdf (accessed 17 June 2013).
12. Mallik, G. & Lodewijks, J. 2010: 'Student Performance in a Large First Year Economics Subject: Which Variables are Significant?', *Economic Papers: A journal of applied economics and policy*, Volume 29, Issue 1, pages 80–86, March 2010.
13. Massingham, P., & Herrington, T. 2006: Does attendance matter? An examination of student attitudes, participation, performance and attendance? *Journal of University Teaching and Learning Practice*, *3*(2), 82-103.
14. Purcell, P. 2007: Engineering Student Attendance at Lectures: Effect on Examination Performance. *International Conference on Engineering Education, September 3-7, Coimbra, Portugal.* Available at http://icee2007.dei.uc.pt/proceedings/papers/107.pdf (accessed 15 June 2013).
15. Rodgers, J. R. 2001: A panel-data study of the effect of student attendance on university performance. *Australian Journal of Education*, *45*(3), 284-295.
16. Maloney, M. & Lally, B. 1998: The relationship between attendance at university lectures and examination performance. *The Irish Journal of Education*, Vol 29, pp.52-62.