Revista ESPACIOS

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Determiners of academic performance of Chilean university students in business and economics

Determinantes del rendimiento académico de los estudiantes universitarios chilenos en economía y negocios

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Contents

ABSTRACT:
The objective of this study is to identify and assess the determiners that influence students' performance in an economics and business school. The method used correspond to a logistic regression model, with sample of 550 students. The results suggest the continued promotion of the quality of the service provided by the instructor, the creation of extracurricular activities and the development of soft skills, as well as the invitation of successful academics or professional to the classroom, affect positively student's performance.
Keywords: academic performance, business, economics, competencies

RESUMEN:
El objetivo de este estudio es identificar y evaluar los determinantes que influyen en el rendimiento de los estudiantes en una escuela de economía y negocios. El método utilizado corresponde a un modelo de regresión logística, con una muestra de 550 estudiantes. Los resultados sugieren que la promoción continua de la calidad del servicio prestado por el instructor, la creación de actividades extracurriculares y el desarrollo de habilidades blandas, así como la invitación de académicos o profesionales exitosos al aula, afectan positivamente el rendimiento de los estudiantes.
Palabras clave: desempeño académico, economía, negocios, competencias.

1. Introduction

Education is a fundamental tool for a country's development, helping to strengthen the human capital, facilitating learning in various fields of knowledge. Therefore, knowing the causes that influence academic performance makes it possible to obtain an approximation of the reality of Chilean university students.

Business schools want their graduates to be prepared for a demanding and changing labor market, and this motivates them to look for methods or programs that produce greater academic performance from their students. Diaz et al. (De Miguel Díaz et al., 2002) suggest that academic performance is an approximation of educational reality and professional success, and grades are its indicator. In turn, performance is considered a variable of educational quality.

Knowing the variables that affect academic performance and how they inter-relate would help in diagnosing in academic terms the students in a certain educational community; then, tools can be designed to improve the educational level of these institutions. For López(López, 1982), efforts must focus on the design of higher education systems that ensure equal opportunities, regardless of whether the students attend public or private institutions. Education has become a construction tool, not only for the lives (López, 1982) contribute to the country's growth through their knowledge in different disciplines.

As the aim of this study is to identify and assess the determiners or factors that influence the performance of students in the Faculty of Economics and Business (FEN in Spanish) at the University of Talca, these are classified as personal, social and institutional determiners. With the identification of the determining factors, tools are provided that can improve university management by promoting new methodologies and skills development programs.

The methodology used is binary logistic regression, with academic performance measured by the independent variables percentage of courses passed and the average grade of all courses attended.

2. Theoretical framework

The importance of education lies in the skills acquired by an individual in the academic training process that facilitate his/her performance in various situations in the environment (Luengo, 2004). These skills are developed throughout a student's university career, and one way to measure their acquisition is through academic performance (Ferreyra, 2007) given that this is associated with the set of abilities and knowledge on matters acquired by the students at a given moment in the program. This in turn is influenced by family situation, social context and institutional environment (Ruiz & Ruiz, 2010).

Garbanzo's theoretical model (Garbanzo, 2012) indicates that performance is determined by the following factors:

2.1. Personal

This considers academic standing prior to entering university, the student's time organization outside the classroom(Girón Cruz & González Gómez, 2005) and cognitive and psychological factors(Garbanzo, 2012; Núñez, Fontana, & Isabel, 2011; Pelegrina, Linares, & Casanova, 2002; Tam, 2001). Thus, indicators corresponding to the secondary school average, type of institution they come from (technical or scientific-humanist) and weighting of the PSU are considered. With respect to the use of extra time, study habits (weekly hours), job, participation in extracurricular activities and time allocated to leisure activities (celebrations, sports & others) are considered relevant. The indicators of cognitive and psychological factors considered usually include the motivations to study, student satisfaction with the program, attitude, personality and self-efficacy.

2.2. Institutional

This consists of form of admission to the program(Vazquez et al., 2012) course syllabus and institutional resources(Álvarez Rojo, García Jiménez, Gil Flores, Romero Rodríguez, & Rodríguez-Santero, 1999; Culver & Warfvinge, 2013; Eyzaguirre et al., 2006; Montero Rojas, Villalobos Palma, & Valverde Bermudez, 2007) and performance in the program(López, 1982; Pozo & Pérez, 2009:). For this the literature mentioned proposes consideration of: institutional accreditation, average number of students per class, assessment between courses (basic, fundamental and program training), perception of instructors (quality), perception of teaching methods and perception of the university (infrastructure, safety and so forth). In terms of performance, the variables proposed are: number of courses failed, number of days attending university, average number of courses per semester, class attendance, student participation in classes, performance in the first year of university and full-time enrollment.

2.3. Social

This comprises the student's demographic situation (Bernal, 2013; Pérez, 2002), the parents' social position (Antoni, 2003) and the student's social situation during the program. The factors included in this group are: housing type and condition, type of residence, people they live with during the study period, the student's daily commute to study and monthly income allocated to fund study-related expenses. In the present study, the environment and conditions in which the young people live during their studies are analyzed; therefore, it is essential to know what types of interaction they have with other individuals and how they cope with daily university life.

3. Methodology

Probability sampling stratified by program (Business Administration (219 students), Business Informatics (124) and Auditing and Management Control (179)) was used on the 522 students at the University of Talca admitted between 2012 and 2015. The methodology consisted of a descriptive analysis of the variables that influence academic performance, then correlations were made, and finally logistic models were considered through the maximum likelihood method to identify the determiners of performance. It is worth noting that the dependent variables used to measure academic performance were the courses passed of all the courses taken and the average grade of the courses taken.

3.1. Survey design

To fulfill the aim of obtaining the data of interest, a standardized survey was applied to the students of the FEN in the Business Administration, Business Informatics, and Auditing and Management Control programs. The questionnaire is made up of four parts: i) student's academic standing prior to entering university, ii) current academic standing, iii) sociodemographic background and iv) situation during the study period. Each item contains the 35 factors to be studied within the theoretical framework.

The types of questions on the survey were closed (yes/no), multiple choice and open data, while the more abstract character questions referring to perception, attitude, motivation and self-efficacy were assessed on a 5-point Likert scale where the response went from 1 to 5, with 1 being "strongly disagree" and 5 "strongly agree".

3.2. Analysis Method

For the present study, the data analysis method to explain the FEN students' academic performance is logistic regression (logit model) according to its application in like cases. Ibarra et al. (Ibarra & Michalus, 2010) emphasize its use in studies with only one dependent variable to be explained and a set of other independent variables that can be transformed by the model.

$$p(y=1 \mid x) = \frac{e^{\beta_0 + \beta_i X}}{1 + e^{\beta_0 + \beta_i X}}$$

where X=vector of independent variables; β_0=constant. The equation reveals the behavior of the independent variables and how each one can influence the probability. From a fit using the properties of maximum likelihood on the coefficients β_i and algebraic procedures associated with the exponential base, a linear logit transformation is obtained, represented por (Ibarra & Michalus, 2010)

$$Ln\left(\frac{p}{1-p}\right) = Ln\left(e^{\beta_0 + \beta_i X}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n$$

This equation represents a linear model in which each of the parameters can take positive and negative values. To determine how well the observations fit there are five statistics to measure the goodness of fit: odds ratio, the Wald statistic, likelihood value, coefficient of determination (R-squared) and the Hosmer-Lemeshow test.

4. Results

This section presents the results of the general model, i.e., the results for the grouping of the three FEN programs, Business Administration, Business Informatics and Auditing and Management Control. When the binary logistic regression is applied, a model is proposed with the statistically significant variables, i.e., if the condition of the p-value being less than an alpha of 0.05 were met. To do this, the regression is done using the forward likelihood ratio (LR) method, which leaves the program to introduce variables into the model, starting with those that have larger, statistically significant regression coefficients. At each step the coefficients and their meaning are re-assessed, being able to eliminate from the model those not considered statistically significant. SPSS creates a series of iterations that are needed to identify the factors that influence the academic results of the FEN students. This process took a total of 10 iterations, where the most significant variables were those shown in the following equation and Table 1.

Table 1 shows the estimations of the logistic model, where the variables that explain academic performance (AP) are the PSU scores, academic satisfaction (PRA6), negative self-perception of performance (PRA14), extracurricular activities offered by the School (FEN7), friendliness with the

instructor (FEN8), guests of academic interest (FEN13), relative requirement level (ESR6), income (Y) and people who live with the student (PER). Specifically, the estimated equation was:

RA = -4,730 + 0.007 PSU + 0.453 PRA6 - 0.372 PRA14 − 0.474 PRA15 + 0.294 FEN7 +0.232 FEN8 - 0,400 FEN13 + 0,326 ESR6 + 0,901Ybajo + 0,773Ymedio + 0,736 PER1 + 1,070 PER2

Table 1
Variables which are included in the model and are
significant in explainingr academic performance

Variable	Significance 5%
Constant	When the dependent variables are zero
PSU (Weighting PSU)	Weighting PSU
PRA 6	Satisfaction with academic achievement
PRA 14	Consider that he/she has not been a good student
PRA 15	Consider that the performance was bad in the first year
FEN 7	The school offers extracurricular activities
FEN 8	Instructor-student relationship
FEN 13	The faculty brings in guests of interest
ESR 6	Requirement level low compared to other universities
Family income	Two levels referring to the family income between the intervals of 0 to $250,000 and $250,000 to $500,000
Roommate numbers	Two levels referring to whether the student lives alone or with tenants, the academic performance increases

Based on the results of the Wald test, it may be argued that all the independent variables are significant; the Hosmer-Lemeshow test indicates that the model fits well, the coefficient of determination was 63.1%, and Nagelkerke's R2 was 34.4%. Thus, it can be stated that the model indeed makes it possible to measure the likelihood of a good academic performance.

5. Conclusions

The variables that explain academic performance are academic satisfaction, student self-perception, self-perception of negative academic performance in the first year, PSU weighting, the school to which the student belongs, the regular extracurricular activities, the friendliness between student and instructor, the requirement level, family income and the people the student lives with. These results are in line with other studies in terms of the influence of the conditions prior to entering university, which in one way or another are linked to subsequent performance (Ibarra & Michalus, 2010).

Thus, there are elements not only of a personal nature that affect the students, but the social and institutional environment generate different attitudes in the students in the university world they inhabit. The institutional environment is where the university management in the business schools comes in. Where, according to the results of the model, there must be continued promotion of the quality of the service provided by the instructor in order to foster a close relationship with the student, creation of extracurricular activities and development of soft skills, as well as collaboration with successful academics and professionals who interact with the students, offering to help them broaden their knowledge in the topics of interest in the companies' area (guests).

the reality of Chilean university students.

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Acknowledgments

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[Index]

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