The Evasion in Disciplines of Graduation Courses: intervening factors

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ABSTRACT

The article focuses on school dropout in higher education. The objective is to identify factors that interfere in the avoidance of undergraduate courses at a private community college. As a method, descriptive analyzes of information collected in institution databases were performed, as well as multivariate analysis, allowing to identify a set of intervening factors in the problem of evasion. As a result, the groups of risk factors identified are of a structural nature, difficulties in the subjects and choice of course. The factors that individually contribute to dropout are: the average of the initial degree in the discipline; the percentage of disapproval of the class and the general average of the class; the size of the class; and the average of credits completed by the student, that is, the more at the beginning of the course, the greater the chance of avoidance. It is possible to conclude that dropout is significantly related to school failure paths, especially of disapprovals, indicating their involvement with students from socially and culturally disadvantaged classes with macro processes of social exclusion.

KEYWORDS
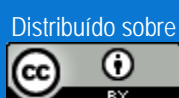
School dropout. Subjects. Higher education. Multiple regression model.

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A Evasão em Disciplinas de Cursos de Graduação: fatores intervenientes

RESUMO

O artigo tem como tema a evasão escolar na educação superior. O objetivo é identificar fatores que interferem na evasão em disciplinas de cursos de graduação em uma instituição de educação superior privada comunitária. Como método, foram realizadas análises descritivas de informações coletadas em bancos de dados da instituição, bem como análise multivariada, permitindo identificar um conjunto de fatores intervenientes na problemática da evasão. Como resultados, os grupos de fatores de risco identificados são de natureza estrutural, de dificuldades nas disciplinas e de escolha do curso. Os fatores que individualmente contribuem para a evasão são: a média do grau inicial na disciplina; o percentual de reprovação da turma e a média geral da turma; o tamanho da turma; e a média de créditos concluídos pelo discente, ou seja, quanto mais no início do curso, maior a chance de evasão. É possível concluir que a evasão se relaciona significativamente com percursos de insucessos escolares, especialmente de reprovações indicando a sua implicação com estudantes de classes menos favorecidas social e culturalmente e com processos macro de exclusão social.

PALAVRAS-CHAVE

Evasão. Disciplinas. Educação superior. Modelo de regressão múltipla.

La Evasión em Asignaturas de Cursos de Graduación: factores actuantes

RESUMEN

El artículo tiene como tema la evasión escolar en la educación superior. Su objetivo es identificar factores que interfieren en la evasión en asignaturas de cursos de graduación en una institución de educación superior privada comunitaria. Como método, fueron realizadas análisis descriptivos de informaciones colectadas en bancos de datos de la institución, bien como análisis multivariada, permitiendo identificar un conjunto de factores actuantes en la problemática de la evasión. Como resultados, los grupos de factores de riesgo identificados son de naturaleza estructural, de dificultades en las asignaturas y de elección del curso. Los factores que individualmente contribuyen para la evasión son: el promedio del grado inicial en la asignatura; el porcentual de reprobación de la turma y el promedio general de la turma; la dimensión de la turma; y el promedio de créditos concluidos por el discente, o sea, cuanto más en el comienzo del curso, más grande la posibilidad de evasión. Así, es posible concluir que la evasión está relacionada significativamente con trayectorias de fracasos escolares, especialmente de reprobaciones, indicando su implicación con estudiantes de clases menos favorecidas social y culturalmente y con procesos macro de exclusión social.

PALABRAS CLAVE

Evasión. Disciplinas. Educación universitaria. Modelo de regresión múltiple

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Introduction

This article deals with evasion in higher education, a phenomenon that has been the object of concern for government agencies and educational institutions in the current scenario. School dropout refers to students who start their courses, but do not conclude, being related to dropping out for any reason other than graduation. It is characterized as a process of exclusion determined by variables and factors internal and external to educational institutions, configuring itself as a complex phenomenon, associated with the non-fulfillment of expectations and reflection of multiple causes that need to be understood in the socioeconomic, political context and the cultural system of the educational system and educational institutions (FRITSCH; ROCHA; VITELLI, 2015).

Education systems and higher education institutions (HEIs), both public and private, are showing high rates of school dropout, especially when measured in undergraduate courses. One of the ways to portray the proportion of this phenomenon, without entering into formulas for calculating evasion, is to take as a reference the relationship between enrolled students, new arrivals and graduates.

The evasion rates in high education are not consensual among the authors who have been studying this phenomenon, which causes difficulties of comparison between the results, being able to induce misleading interpretations. Vitelli and Fritsch (2016) distinguish and problematize different conceptions and uses of formulas by highlighting the risk of comparisons that would be statistically unmatched.

Table 1 was constituted with data from the Statistics Synopsis of the Higher Education Censuses in Brazil (BRASIL, 2010/18). Considering the period from 2000 to 2017, the number of enrollments in higher education courses in HEI in Brazil increased by 207.57%. Regarding the number of HEIs, the increase was 107.46%, 288.84%, and 269.46%.

Taking only census data between 2010 and 2017, the number of enrolled in the period showed an increase of 52.07%. In turn, the number of graduates increased by 44.67%. With regard to the number of new entrants, there was an increase of 79.05%. The number of HEIs showed a decrease between 2012 and 2015 of -2.15%, returning to growth after this period. It is also important to note that the number of graduates grows in two moments and in different rhythms: up to 2005 with 121.06% and, after 2005, the increase was 67.23%, slowing the pace.

Another aspect to be highlighted is with regard to the completion rate, in 2000 it was 12%, while in 2017 it increased to approximately 14%. In 18 years, Brazilian higher education was able to increase only two percentage points in the completion rate.

Table 1. Evolution of data of the Brazilian Higher Education, Graduation 2000-2017

Periods	Number of Enrolled	Number of IES	Number of Newcomers	Number of Graduates
2000	2.694.245	1.180	829.706	324.734
2001	3.030.754	1.391	1.206.273	352.305
2002	3.479.913	1.637	1.411.208	466.260
2003	3.887.022	1.859	1.540.431	528.223
2004	4.163.733	2.013	1.621.408	626.617
2005	4.453.156	2.165	1.678.088	717.858
2006	4.676.646	2.270	1.753.068	736.829
2007	4.880.381	2.281	1.808.970	756.799
2008	5.080.056	2.252	1.783.806	800.318
2009	5.115.896	2.314	1.732.613	826.928
2010	5.449.120	2.378	1.801.901	829.286
2011	5.746.762	2.365	1.915.098	865.161
2012	5.923.838	2.416	2.204.456	876.091
2013	6.152.405	2.391	2.227.545	829.938
2014	6.486.171	2.368	2.383.110	837.304
2015	8.027.297	2.364	2.920.222	1.150.067
2016	8.048.701	2.407	2.985.644	1.169.449
2017	8.286.663	2.448	3.226.249	1.199.769

Source: Brasil – INEP/MEC (2001 - 2017).

Available data indicate that Higher Education in Brazil is expanding, characterized by an increase in the number of institutions, enrollment, and creation of new courses. Although there was a growth in enrollments this was not reflected in the data on the graduates. This shows that there is a very large difference between the number of incoming students and the graduates, which may be associated with student drop-out or even retention.

The evasion phenomenon can be better understood when it is examined from the perspective of the students' formative pathways. Recently, the Ministry of Education (MEC) published a new methodology for the evaluation of students' course indicators, classifying them as: permanence rate (TAP), cumulative completion rate (TCA) and cumulative dropout rate (TDA). The trajectories of the students in the formal educational paths, according to INEP (BRAZIL, 2017ab), are structured from the curricula of their courses. In this way, it is possible to follow chronologically the trajectory of the students from their entrance in a formative itinerary, also identifying their success or failure.

Depending on the type of student's link to the course, INEP's "Methodology for Calculating the Flow Indicators of Higher Education" (Brazil, 2017a), classifies students in three possible situations, as shown in Chart 1.

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Chart 2. Possible situations of students in undergraduate courses and their descriptions

Situations	Descriptions
Permanence	It corresponds to students with a bonding situation equal to "attending" or "enrollment locked", that is, it deals with students who have active connection to the course and, therefore, should be informed with any bonding situation in the following year (in the same course and with the same date of entry).
Withdrawal	It corresponds to the students with a situation of equal bond to "unlinked from the course" or "transferred to another course of the same Institution of Higher Education (HEI)", ie, such students have terminated their connection with the course and therefore should not be informed in the following year (in the same course and with the same date of entry).
Conclusion	It corresponds to the students with a bonded situation equal to "graduated", that is, they also terminated their connection with the course and, therefore, should not be informed in the subsequent year (on the same course and same date of entry).

Source :BRASIL (2017a).

The permanence situation corresponds to the students who, after joining the course, are still enrolled or locked in the period studied (2010-2015). The withdrawal situation is equivalent to the students who have escaped from the course. Finally, the conclusion situation corresponds to the students who obtained diploma in the course. The methodology of the construction of the indicators became viable with the changes promoted in the Census of Higher Education, which allowed to follow the trajectory of the students based on their identification data, such as the Register of Individuals (CPF). Thus, the enrollment in higher education in 2010 was monitored until 2015, allowing to know the situation of all these students in their respective training paths throughout this period.

Therefore, the cumulative rates presented by undergraduate courses differ significantly between them. In 2015, the highest accumulated dropout rate (TDA) found was 100%, this happened in 0.85% of the courses. At this rate, curricular changes that happen in a compulsory way (when students are reallocated to the new curriculum, considered, therefore, evaded from the previous curriculum) will be considered. The average cumulative dropout rate for all courses was 15.54%, which corresponds to the total loss of students in undergraduate courses in 2015, with enrollment in 2010, without considering transfers of students between Institutions of Education Higher Education (HEI).

This way of monitoring the progression of the students of higher education generates data that allow to verify how fluently the students traverse their formative itineraries, accelerating or delaying the completion of their courses. It also allows for a better understanding of dropout in undergraduate courses, revealing how this phenomenon develops over a broad period (for the time being, six years).

The definition of evasion depends on the granularity and temporality of the information to be researched, and can be measured from the discipline, course, institution or educational system. The objective of this study was to identify factors that interfere in evasion in courses of undergraduate degree in a community-based private higher education institution.

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This article presents results of a study of avoidance in undergraduate courses at a private community university. The option is related to previous internal studies of the institution developed by the authors that point to avoidance in the disciplines as an indicative of avoidance of the course and institution. The concept of avoidance refers to the number of students who, at the end of the semester, are in the subject in one of the following conditions: without frequency or cancellation. For this, students are evaded of the disciplines as being those that present frequency less than 75%, canceled the course and, even though they did not attend, they did not carry out the evaluations.

With regard to the production of knowledge, evasion has become the object of study in Brazil and in several countries. Reviewing the literature, it is confirmed that the phenomenon is perceived in public and private institutions, so that seeking to understand their motives has been the goal of many researches in the educational area.

The pioneering studies in the United States and Brazil have centered the understanding of the phenomenon in the individual, leaving invisible aspects related to the evolution of the phenomenon, educational institutions and society, which brought different results according to the content addressed, especially when the objective was to identify the motives and variables that interfere with school dropout. In the United States, the studies of Red (1987, 1993) , 1996), Braxton (2000), Braxton, Hirschy and Mcclendon (2004), Cabrera (1992), Cabrera *et al*. Cabrera and Nora (1994), Cabrera, Nora and Castañeda (1993), Tierney (1999), Bean and Metzner (1992), Cabrera, Colbeck and Terenzini (2001), Cabrera and La Nasa 1985), Adelman (1999), Museums, Nichols and Lambert (2008), Museums and Quaye (2009), Nora *et al*. (1996) Nora and Cabrera (1996), Nora, Crisp and Matthews (2011), Nora and Crisp (2012). The most recent studies of Tinto (2012) point to factors and determinants of institutional integration related to the probability of avoidance in higher education.

In Brazil, there are several studies on evasion in higher education (POLYDORO, 2000; ANDRIOLA, ANDRIOLA AND MOURA, 2006; ANDRIOLA, 2009; ADACHI, 2009; TIBOLA *ET AL*., 2012, and TONTINI and WALTER, 2014. Recently Santos Junior and Real (2017) produced a survey of research on evasion in higher education, conducted since the 1990s in the country.

For this study, especially those works that have been devoted to understanding the reasons for avoidance, focusing on factors and determinants related to students, undergraduate courses and institutional aspects, such as Adachi (2009); Amaral (2013); Andriola (2009); Baggi (2010); Biazus (2004); Bardagi (2007); Oliveira et. al., 2019; Fialho (2008); Martins (2007); Matias (2003); Palace (2012); Pereira (2003); Pereira Júnior (2012); Silva Filho *et al*. (2007); Silva (2009); Teixeira (2006); Veloso and Almeida (2002). Also relevant are the results of the Comprehensive University Abandonment Management Project (GUIA), funded by the Latin American Academic Training Program (ALFA) of the European Community - which has been working to enrich knowledge about the problem of dropout in higher education and identify good practices (SANTOS, ANDOAÍN and MOROSINI, 2013).

There is accumulation in the production of knowledge on the subject, but it has been identified a gap of studies that evaluate factors intervening in the evasion in disciplines, that could contribute with preventive actions during the course of the students in the undergraduate courses. The construction of a model of forecast of the evasion by discipline involves the identification of the variables that contribute to the existence of this phenomenon by class, in undergraduate subjects.

Methodology

It is set up with a descriptive study. The methodology used in this research was quantitative, using the descriptive and multivariate analysis technique and the development of a logistic regression model (CORRAR; PAULO; DIAS FILHO, 2007; HAIR *et al*., 2005) that involved a series of steps.

Multivariate Data Analysis can be understood as a process where a linear combination of variables with empirically determined weights is established. The variables are specified by the researcher, the weights being determined by the technique used to analyze the results in the collection of variables. The Multivariate Analysis can be defined as a set of methods that allows the simultaneous analysis of data collected for one or more sets of individuals characterized by more than two correlated variables, being that the variables can be quantitative or qualitative (CORRAR, PAULO, DIAS FILHO, 2007). In the process of multivariate analysis of data, the variable defined as (dependent) response becomes a combination linear relationship of the other (independent) variables. Several techniques can be made available today. The option for one technique over the others is related to factors such as the level of measurement of variables, mainly the dependent variable and the objective of the study.

In order to determine the type of analysis to be developed, it is necessary to answer some questions, such as: Is there a dependent variable in the research problem? For this questioning, the answer of this study is yes, the variable in question **is the percentage of evasion in the group of disciplines.** The dependent variable is quantitative or qualitative? The option for the evasion variable occurs in the form of percentage of avoidance by discipline, therefore it is of a **Quantitative** nature. Thus, the most indicated technique is the **Multiple Regression.**

The Multiple Regression technique allows analyzing the relationship between a single dependent variable and two or more independent variables. It creates the necessary conditions to describe, through a mathematical model, the relationship between a quantitative dependent variable and two or more independent quantitative or qualitative variables (dummy variables). The Dummies variables are used for nominal variables with two or more categories of responses, also referred to as binary variables. They are explanatory variables, which can take one of two values, zero or one (HILL, GRIFFITHS, JUDGE, 1999). These variables

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constitute an instrument to represent qualitative characteristics of data. By the presence of this type of variable in the study, the use of this type of resource becomes necessary.

Thus, a nominal variable with two response categories of type: variable class of the activity class (face-to-face or distance course) is represented as follows: Face-to-face = 1 and Distance = 0 (or vice versa). In the case of variables such as teacher titration, which have more response categories, the Dummies variables assume values of 1 when the presence of one category in the model and 0 when the other categories in the model are absent.

In the software used to adjust the model, it is necessary to establish how the Regression Model equation is arrived at. The method chosen was stepwise. In this method, variables are introduced one by one into the model. After the inclusion of variables, the model is evaluated in relation to its predictive capacity and, step by step, new variables are included in the model until an optimal combination of variables is found. The stepwise method allows the researcher to examine the contribution of each variable independent for the regression model (HAIR *et al*, 2005). Each variable is considered for inclusion prior to the development of the equation. The independent variable with the greatest contribution is added at first.

It is important to emphasize that the decision for a certain set of variables interferes directly in the results obtained. Another relevant factor in this process is that this model is not watertight. Once changed some conditions, the model automatically changes by transformations. For this reason, it is not recommended that it be adopted for a very long period. It is important to make adjustments in the model to verify the need for inclusion of new variables, elimination of others or changes in weights of coefficients of variables. Moreover, it is not a deterministic model, that is, it does not determine the occurrence of evasion in a class, since probability is not a certainty; thus, a class with all the characteristics of potential for evasion may not have the occurrence of this fact.

The construction of the model followed steps sedimented in theoretical conceptions and evaluated only variables originating from the database; in this way, it is not complete by itself. Some variables that could be important in configuring a class with evasion potential are not necessarily available in the database. Therefore, it is fundamental to consider that subjective factors could not be measured through a mathematical model.

The first step in the estimation of the regression model was the selection of variables. It is important to note that the decision for a given set of variables directly interferes with the results obtained and that the regression model is not a deterministic model, that is, it does not determine the occurrence of evasion in a class, since the probability is not a certainty; therefore, a class with all the potential characteristics for avoidance may not be affected by this fact. The identification of the previous variables of analysis was made based on the relevance indicated by surveys already carried out and the availability of the information in the database in the analyzed institution. The year surveyed was 2017 with a sample of 2546 classes. The variables selected for analysis were:

- Discipline shift (morning, afternoon, evening or night);

- Day of the week (Monday to Saturday);
- Number of courses attended by the course;
- Class size (number of students enrolled in the class);
- Area that the discipline belongs to;
- Average grade of the class (Final Grade);
- Average grade of the class (Partial Degree);
- Modality of the discipline (face-to-face or distance that refers to 20% of subjects in this offer;
- Semester of the course where the discipline is inserted (1, 2, etc.);
- Timetable of the academic discipline (30, 60 hours);
- Average age of students in the class;
- Average number of credits completed per student/class;
- Average number of subjects enrolled in the semester student/class;
- Average teacher evaluation of the class (minimum 5 evaluations);
- Classroom teacher load;
- Class teacher's degree;
- Length of service of the class teacher (in semesters);
- Age of the class teacher;
- Class gender of the class,
- Percentage of students with a final average of less than 6 (disapprovals).

After the choices and definitions of the final model of the study, statistical tests were performed to identify the assumptions of the model, using a software to analyze the results and later analysis and construction of the final multiple regression model. In this step, Statistical software Package for the Social Sciences (SPSS) was used, as a basis for testing the assumptions of the model and subsequent analysis and construction of the final multiple regression model.

The number of variables collected was 21, being 1 dependent and 20 independent. The multivariate model initially requires the definition of a response variable, and the percentage variable of avoidance by graduation group was chosen. This choice is related to the fact that the classes have different amounts of students, and it is unproductive to work with the variable absolute amount of dropout per graduation group.

The analysis of the variables that make up the proposal of the multiple regression model was constituted in a descriptive way for each variable, segmented between students evaded and not evaded from the classes of the disciplines. Thus, it was possible to identify the contribution of each variable, in isolation, to the percentage of evasion per class of discipline. When the variable to be evaluated was quantitative, its correlation with the variable evasion rate was obtained. Correlation is a measure of association that can generate results between -1 and 1. The closer to 1 is the result, regardless of the signal, the greater the relationship between the variables. When it is positive, it is a direct relationship; when it is negative, it is

an indirect relation. In case the variable is qualitative, it was presented the rate of evasion by category of the variable, since it is not possible to obtain the correlation in these cases.

Results

In the surveyed classes, the percentage of evasion was around 5 to 10%, with the overall average evasion of 7.49%. It has been observed that evasion tends to be higher in disciplines with higher failure rates because, considering the percentage of failure and the avoidance rate, the correlation is 0.21, which is a very weak relation - that is, the results show differences, but little relevance.

The evasion, according to the study shift, presents differences. The afternoon shift entails fewer classes in which evasion occurs compared to other shifts. In the morning shift, the highest percentage of classes with an evasion rate higher than 10% is located. Some reasons that may contribute to this result are related to the fact that students request transfer of class from morning to night, to reconcile employment and study, thus evading the morning shift. Considering the calculation of evasion by shift, it was noticed that, in the morning classes, the average evasion rate is 9.36%, the highest result obtained. This result reinforces the indication that the classes of the morning have higher rates of evasion than the other shifts.

Interestingly, evasion, when observed by day of the week, indicates that on Saturday there is a greater percentage of classes with evasion higher than 10% (44.62%), unlike what happens on other days of the week, when this percentage rotates around 21 to 27%. Wednesday is the day of the week in which there was the lowest percentage of classes with a percentage of dropout (62.43%). Considering the information of the day of the week and of the shift, simultaneously, it was possible to identify that the highest evasion occurs on Saturday morning (13.33%) and that the smaller one happens on Wednesdays in the afternoon (3.76%). The difference between them is quite significant, but there is not enough information that can explain this phenomenon.

Analyzing the evasion from the number of courses that the class attends, in general, what is perceived is an increase in the rate of evasion when the class attends more than six different courses. In these cases, the avoidance rate exceeds 10%.

The evasion, when glimpsed from the size of the class, is accentuated when there are more than 40 students, a result that is not the same when the rate of evasion is observed. An important aspect to be highlighted is that the avoidance rate is calculated from the size of the class, so there is a direct relation of association. In this case, when the class has a few students, the dropout rate tends to be higher: for example, in a class of ten students, two dropouts correspond to 20%. On the other hand, when the class is very large, a larger number of evaders is required to have a higher percentage. For example, six students in a class of 50 account for 12%. When analyzing the correlation between these variables, it approaches zero,

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indicating the absence of correlation, which means that, regardless of the class size, there will be evasion.

Another aspect assessed relates to the final grade point average of the students in the class. This aspect, in some way, shows the degree of difficulty of the discipline. When the average student performance in the class rises, the dropout rate tends to be lower. Upon obtaining the correlation between these variables, they were found to have a weak and negative relation (-0.39); therefore, the lower the average performance of the students in the class, the greater the evasion rate tends to be, although this variable alone has little influence on the avoidance rate.

The average performance of the students in the partial grade was also considered to better understand the dropout by class. There is a relation between the average grade of the class and the avoidance rate. When the correlation between these two variables is obtained, the result (-0.56) indicates a higher relation than among the other variables surveyed. Among all the quantitative information possible, the correlation between the average of the partial degree of the class and its percentage of avoidance was the most intense, although its intensity is not very statistically significant.

When observing the rate of evasion by type of modality (face-to-face or distance), it was observed an evasion in classes of face-to-face classes much higher than the rate obtained in classes at a distance. This is another result when comparing the results of avoidance indices in face-to-face courses with fully distance courses, where drop-out rates tend to be higher.

Regarding the dropout in undergraduate courses, it was verified that, in the initial semesters of the course, this occurs in greater intensity. When considered the semester in which the discipline is met, this fact is confirmed, that is, in the subjects of the initial semesters, the avoidance rates are higher than those offered in subsequent semesters. The greatest drop-out happens, therefore, in disciplines that are taught at the beginning of the course[1]. This fact reinforces the idea that avoidance by discipline is indicative of avoidance in the course.

The evasion rate was also segmented based on the type of discipline. The classification of the type of discipline was constituted from the possibilities of student status in the field designated as type of discipline. As most subjects take place in the classroom, this category is separated from the others. In "others", all other categories (e.g., internships, course work, tutorials, exchanges, etc.) were grouped, totaling 209 answers, in a total of 2546 classes. The disciplines developed in the form of class have an evasion rate a little higher than the other categories.

The hourly load of the classes surveyed, by discipline, is basically of 60 class hours, while the other hours load (179 of a total of 2546 classes), as they appear in smaller quantity,

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[1] It is considered beginning of the course until the third semester.

were grouped in "others". The avoidance rate in classes with a 60-hour workload is higher than in the other classes.

The average age variable of the students in the class indicates that the higher the average age, the lower the avoidance rate. This fact may be related to the understanding that, the more the student advances in the course, the greater his or her age. Thus, dropout is higher at the beginning of the course, when students are, on average, younger. When the correlation between the two variables is calculated, the value reaches -0.05, indicating practically an absence of linear relation, mainly due to the fact that currently enrolled in the courses also students with more advanced age.

The avoidance obtained considering the average of credits already completed shows that it happens, as a priority, when the student has still few credits completed, and therefore, at the beginning of the course. As the student progresses in the course, avoidance rates decrease, which is why it is important to have a follow-up at the beginning of the course, a period in which the probability of avoidance is higher, and the issue of professional choice is significant. The correlation between these two variables is -0.34 (negative and weak), because, as the number of credits completed increases, the avoidance rate decreases.

When analyzing the rate of evasion from the perspective of the average number of subjects enrolled, a relationship was observed between these variables, which associates the fact of doing few disciplines with the effectiveness of evasion. The correlation between these variables is -0.14 (negative and weak), that is, as the number of classes in which the student is enrolled increases, the percentage of evasion per class decreases, although this ratio is not very high statistically representative.

Regarding the weekly workload of the teacher, it was possible to notice that there is no direct relation between this fact and the rate of evasion in the classes of the disciplines that the teacher teaches. Even when the correlation between these two variables is obtained, the result shows a significant absence of correlation (0.07).

Teacher titration was also considered to evaluate class dropout. In general, there does not seem to be a significant difference between the teacher's degree and the avoidance rate of the classes taught by him. In this respect, there is no pattern of behavior of the results, confirming the idea that there is no relationship between these variables.

The time of service of the teacher in the university also did not prove significant to explain the rate of evasion by class. The correlation obtained between the teacher's service time and the avoidance rate of his class was 0.05, which points to the absence of a relationship between these two variables due to a near zero correlation.

As well as the time of service of the teacher in the university, his age also did not prove significant to explain the rate of evasion by class. The correlation between the age of the teacher and the rate of evasion of his class was -0.02, that is, practically nil.

Finally, the teacher gender was also not significant in explaining the rate of dropout per class, since the correlation between the gender of the teacher and the dropout rate of his class did not present significantly different results.

From the results presented in this first moment of evaluation, it was possible to highlight some variables that, in isolation, increase the risk of avoidance by class of subjects. The segmentation of these variables occurred from an association criterion. As factors that increase the risk of evasion in the classes, the structural ones, the difficulties of the discipline and the individual ones that are related with school history and age stand out.

In the structural factors are significant the variables: the shift in which the class occurred; the day of the week; the class modality (whether face-to-face or distance); and the number of courses to which the course group attends.

Characterized as discipline difficulties, there are the following variables: the percentage of students disapproved in the class and the average performance at the end of the semester and in the partial grade. The class average in the partial grade was the most relevant information to explain the avoidance rate.

Finally, the individual factors are associated with the semester in which the discipline is taught: more at the beginning of the course, there is greater avoidance due to the uncertainty about the course choice, which also appears in the number of credits completed, since avoidance decreases as the student progresses in the course. In addition, the average age of students appears as a factor to be considered in class avoidance.

One variable to emphasize, not present in these three segmented sets, is the average number of subjects in which students are enrolled in the semester. Part of this indicator is related to economic factors. It is important to emphasize that among the variables of the teachers' profile, none appeared as significant in the bivariate analysis, except that the difficulty factors of the classes of the subjects can be related to the teacher and the methodologies of teaching, learning and evaluation. In figure 1, the summary of the model obtained by the bivariate descriptive analysis can be visualized.

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Figure 3. Summary of the variables of higher risk of evasion by graduation group
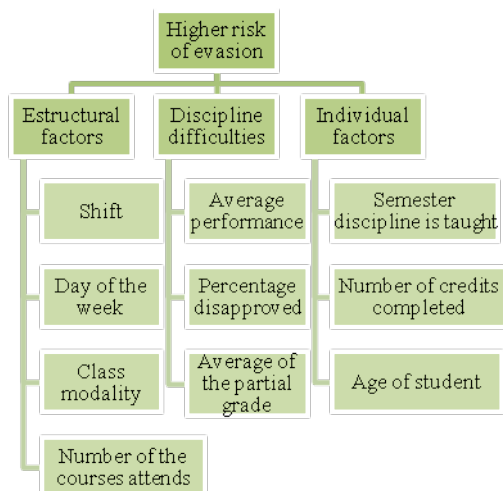
Source: prepared by the authors

The identification of significant variables in the model occurred from the development of a multiple regression analysis. The use of this technique also considers the choice of a methodology that uses the stepwise system. Thus, the model was reduced to the following set of variables (the other variables included in the initial model were not considered significant):

- Average of Partial Degree (MGP) X_1
- Average completed credits (MCC) X_2
- Percentage of failed in the class (PRT) X_3
- Number of students in the class (QAT) X_4
- Final grade average (MFT) X_5

Differently from the previous (bivariate) analysis, in the multivariate analysis is also considered the interrelation between variables, which means that the fact that one variable is present in the multiple model is related to the presence of another variable. Thus, the two variables together become important, while in some cases alone they would not have significance. The regression model was constructed using a generic equation, which can be expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_n X_n + \varepsilon$$

Being that:
Y is the dependent variable;
X are the independent variables of the model;
n is the number of variables that make up the model;
ß are the regression parameters;
ε is the term representing the regression residue or error.

The term β_0 is called the intercept, or linear coefficient, and represents the value of the intersection of the regression line with the Y-axis. It represents the value of Y (percentage of

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evasion) when X equals zero. The terms β_1, β_2 etc. are called angular coefficients and determine the regression line, which estimates the percentage of evasion from the set of significant variables of the regression model.

In this specific case, the five variables present in the model form a regression line expressed as follows (where Y is the avoidance percentage):

$$Y = -4{,}464\,MGA - 0{,}036\,MCC - 17{,}674\,PRT - 0{,}103\,QAT - 1{,}352\,MGT + 50{,}656$$

The five variables present in the model explain 40.9% of the variations occurring in the percentage of evasion. The coefficient of multiple correlation of the model is 0.64, a result that is not very expressive. Thus, it is possible to suppose that there are other unseen variables that may be explaining the result of the dropout percentage of undergraduate classes. In summary, it is possible to observe the evasion in classes of the graduation by means of figure 2.

Figure 2. Participating factors in graduation evasion by class
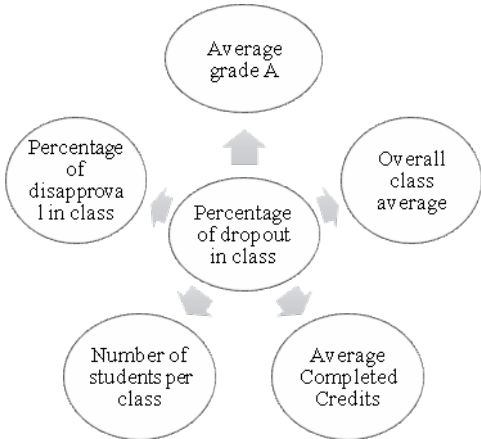
Source: prepared by the authors.

Analyzing the variables present in the regression model, some aspects stand out. Three variables have a direct relation: the average of the partial degree, the final average and the percentage of disapproval have a direct relation between them. The others have a different nature. What this set of variables indicates is that the classes in which there are many students, who have a high failure rate and are taught at the beginning of the course, when they present average in the low partial degree, are more likely to present an increase in the percentage of avoidance.

Final Considerations

In the development of the bivariate analysis of the data, some variables were presented as possible shocks to avoidance by discipline. By grouping the variables into structural

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factors, discipline difficulty and individual factors that relate to school history and age, some important considerations can be made.

Regarding the structural factors, it is important to highlight the shift of the class of the discipline, since the morning classes present, on average, a greater percentage of evasion than the others. Similarly, the day of the week also shows difference in levels of avoidance. One of the hypotheses for the case of the day classes is the insertion of the student in the labor market, making his studies unviable during this shift. With regard to the days of the week, a study is recommended to identify the causes of this phenomenon. In the classes offered on Saturdays, the percentage of evasion was higher than the other days of the week. The class offer modality indicated that, in face-to-face courses, dropout was on average higher in the distance modality, unlike what happens in the offer of fully distance courses, where the dropout rate is higher. When a class is due to a course that attends to several courses, the evasion rate is also higher. The more courses the discipline meets, the greater the possibility of evasion in the class. As hypotheses for this, it is pointed out the diversity of interests of the students because they belong to different areas and the difficulty of the teacher to develop pedagogical practices that meets all the expectations of different courses.

The degree of difficulty of the class or even of the discipline was also representative in the presence of evasion. In classes where the average student performance is lower, the dropout rate on average is higher. It should be noted that the average of the partial grade was more significant to explain the dropout rate than the final grade point average. In this sense, the average partial-degree performance deserves special attention in order to minimize evasion rates. One factor that may justify a higher contribution of the partial grade is that it anticipates, in some cases, the final grade point average if the students did not evade at that time.

Regarding individual factors, the percentage of disapprovals stands out, the higher this percentage, the higher the rate of evasion of the class tends to be. In a way, the variables performance note and failure percentage are directly related to each other, that is, the higher the percentage of disapprovals, the lower the average performance of the students in the class tends to be.

The more at the beginning of the course the discipline is offered, the greater the evasion rate tends to be. Therefore, when evaluated the average amount of credits already completed by the student, it is noticed that the more credits completed, the greater the reduction in the avoidance index tends to be. The average age of the students in the class, being higher, also has a direct relation with the semester in which the students meet, that is, the average age is higher for students at the end of the course.

One aspect not considered among the three variable segments was the average enrollment of students in the class: the higher the average enrollment, the higher the dropout rate tends to be. Part of this result can be explained by the fact that a greater number of disciplines being studied requires more dedication and more time for the student.

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When evaluating the multiple regression model, five variables stand out as more significant: average of the partial degree; average of the class; number of students in the class; average credit completed; and percentage of disapproval in the class. These variables are not determinant in the evasion process; only indicate, through indicators, aspects that need to be monitored.

The combination of these variables explains part of the result of the evasion by class. However, it is important to consider other aspects, not present in this study, that can contribute to explain the graduation rate per graduation group. Taking into account results already obtained by previous studies, it is possible to identify the need to elaborate a qualitative research to better understand the phenomenon of evasion.

Due to the relevance of the students' performance, within the set of variables involved in the process of avoidance by class of the discipline, it is important to highlight that the moment of completion of the partial degree would be a propitious period for the accomplishment of a qualitative study directed to students with performance below the expected, identifying subjective aspects in the intention to evade the discipline and that, many times, have direct relation with the avoidance of the graduation course.

The presence of the five variables in the multiple regression model can be monitored, even in previous semesters, in order to have more clarity about their contribution to the graduation outcome of undergraduate courses. Analyzing the various aspects raised, it is possible to establish the hypothesis that the number of students in the class, the semester in which the discipline is offered in the curriculum and the number of courses are, in large part, the same reality: course have more students and are more likely to be shared between different courses.

According to Oliveira at. al. (2019) in a survey of 63 students who had escaped from a campus of a public university using exploratory and confirmatory factor analysis confirmed the frustration due to academic performance, altered mental health, lack of will to graduate choice, lack of family support, lack of commitment to graduation. It is possible to infer from the literature review and from the results of this study that dropout correlates significantly with school failure paths, especially rewards indicating their involvement with students from socially and culturally disadvantaged classes with macro processes of social exclusion.

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