Academic Success/Failure in a Higher School of Technologies and Engineering

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Abstract - **Strategies to combat academic failure in higher education go through the knowledge of the causes associated with it. A questionnaire survey was implemented in a Higher School of Technologies and Engineering. The questionnaire was available for a period of 2 months, from 27 February to 27 April 2018. The PLS-SEM model was used to analyze the results. Student-related aspects were those that exhibited the greatest impact on academic success/failure. The teachers and the institution/curriculum had an indirect impact through mediation by the students' factor. Other variables identified with a negative residual impact on academic success were: being dislocated from habitual residence, disliking to study and being male. With a slightly more relevant impact value, attendance to classes and sleep time on the eve of the tests, emerged.**

Keywords – Academic, Success, Failure, PLS-SEM

INTRODUCTION

Academic failure in Higher Education related to Technologies translates into high rates of disapproval and abandonment and an extended time to complete the respective academic degrees. Strategies to combat academic failure arise by understanding the causal factors associated with it. Therefore, it becomes necessary to clearly define the metrics to measure the success/failure. Success can be measured by academic results as Monteiro et al. (2005) and Coutinho (2007) do. Brites-Ferreira et al. (2011) grouped the variables into factors related to the institution and factors related to the individual. They also pointed to the gender, age and cultural and academic heritage of the nuclear family (parents), as they may play a role in student success/failure. Monteiro et al. (2005) analyzed the study methods of first year students at the moment of enrolling at the University of Minho, using the Inventory of Attitudes and Habitual Behaviors of Study (IACHE) (Tavares et al., 2004), composed of five subscales. The academic performance of the students was measured by the ratio of the approved disciplines and the number of disciplines included in the semester plan, and by the average score obtained in the approved disciplines. The authors conclude that the different approaches to learning are an important explanatory factor of the classifications obtained by the students. Zajacova et al.

(2005) developed a questionnaire to measure the level of academic self-efficacy and perceived stress associated with 27 school-related tasks. The analysis of structural equations was used to predict three different measures of academic performance: the GPA (Grade Point Average) for the first year, the number of accumulated credits and the retention after the first year. Correia et al. (2003) consider four dimensions that may imply the academic success or failure of the student: the individual dimension, the pedagogical/didactic dimension, the institutional dimension and the external environmental dimension. In a study with students from University of Minho, Taveira (2000) identifies the factors associated with failure and groups them into two main groups: individual and contextual factors. Almeida and Araújo (2015) define academic success according to school scores, weighted average of scores, ratio between the number of approved disciplines and the number of disciplines provided by the curriculum, permanence and completion rates and number of years for completion. They also identify factors associated with success/failure. These factors may be associated with the student, with the teachers, with the curriculum or with the institution. Davies (2000) points to reasons for failure as reasons of economic order, low motivation, lack of previous preparation, health problems, family problems and low self-esteem. Sibanda et.al (2015) identify several factors that were considered by the students as having great influence on academic success, such as regular study, presence in class, hard work, commitment and dedication.

METHODOLOGY

The factors used in this approach to the academic success/failure focused on four factors: factors associated with teachers, students, institution and curriculum (these last two factors were later joined together). A survey was built by questionnaire, which was placed on a digital platform that the students accessed to respond to it. The questionnaire was available for a period of 2 months, from 27 February to 27 April 2018. There were 205 responses corresponding to a response rate of 18%. Two variables were constructed to measure academic success/failure. One was defined by the ratio of the number of disciplines successfully accomplished, by the number of enrolled disciplines in the first semester of the 2017/2018 academic year, that has been fixed in 5

disciplines, and another by the sum of the five best scores obtained in the approved disciplines. Only those students enrolled in that semester in at least five curricular units were considered. All students with more than five disciplines approvals were considered to have a 100% ratio. The PLS-SEM model (Hair et al., 2014) was employed to analyze the relationships between the variables. The software used was Smart-PLS 2.0 (Ringle et al., 2005).

The model built consists of two central endogenous variables, the two previously variables constructed to measure academic success/failure, that is, the percentage of disciplines carried out and the classification obtained. It was considered that the percentage of disciplines carried out impacted the classifications and that there was an indirect effect on the two central endogenous variables, from the factors professors and institution/curriculum, through mediation by the students' factor.

CONCLUSIONS

The model explains 22.4% of the variable 'percentage of disciplines made' and 85.4% of the variable 'total score obtained in the 5 best disciplines'. The three factors, students, teachers and institution/curriculum, were evaluated positively by the students, especially the students' factor. The vast majority of the students who answered the questionnaire (72.8%) were approved in at least 5 disciplines.

Student-related aspects were the ones that had the most impact on academic success/failure. It was not possible to demonstrate any direct impact of the institution/curriculum related to the success/failure. Teachers seem to have only a residual influence on student achievement. However, these two factors had a significant impact, at a significance level of 10%, on the students' factor, which allows one to conclude that their main action is via mediation through the students' factor and not through direct effect.

Other variables identified with a negative residual impact on academic success were: being displaced from the habitual residence, disliking to study and being male. With a slightly more relevant impact value, attendance to classes and sleep time on the eve of testing, as reasons for success/failure, come up. Finally, the model points to the proper student preparing time as a cause for success/failure, where success increases, on average, with the lack of time. This apparently counterintuitive result is most probably explained by the measurement of the individual time perception rather than real time. The best students, those who generally achieve success, may perceive a greater lack of time than the less successful students.

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