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Artículos de investigación científica y tecnológica

STUDENTS AND THEIR GOALS. LINKS TO CAREER ACHIEVEMENT AND LAGGING BEHIND

Los estudiantes y sus metas. vinculaciones con el logro y retraso en la carrera

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Abstract: The purpose of this article is to focus on the goals with which engineering students faced learning at the time of entering university and after five years. It analyzes the connection between the goals and achievement or lagging behind throughout the program. A qualitative methodology was applied, and 48 engineering students from a public Argentinian university participated in the study, who were contacted to collect data five years after their entry; 15 of the 48 students were seniors; another 15 were somewhat lagging, although after 5 years, they had passed more than 50% of the program; finally, the remaining 18 students were lagging behind extensively, as they had only managed to complete less than 50% of the program. The 48 students responded to a personally-administered questionnaire in a one-to-one meeting with the researcher, who asked them to identify themselves with one of 5 student types, each oriented towards different goals, at the time of entry and at the time of responding to the instrument. Results showed that among students with achievement trajectories, learning goals from the moment of entry prevail and are sustained five years later. On the other hand, students who, after five years at university had not yet passed 50% of the program, had goals such as protecting self-esteem and avoiding failure, which are associated with unfavorable learning behaviors.

Keywords: Academic trajectories, achievement, lagging behind in studies, goals, motivation.

Resumen: El objetivo del presente artículo es focalizar la atención en las metas con que estudiantes de ingeniería afrontaron el aprendizaje en el momento de ingresar en la universidad y luego de transcurridos cinco años. Se analizan las relaciones de las metas con el logro o la demora en el curso de la carrera. La meto-dología empleada es cualitativa, mediante la cual participaron del estudio 48 estudiantes de ingeniería de una universidad pública argentina, quienes fueron contactados para la recolección de datos cinco años después de su ingreso; 15 de los 48 estudiantes se encon-traban cursando el último año de la carrera; otros 15 estaban algo demorados, aunque habían aprobado, luego de cinco años, más del 50% de la carrera; por fin, los restantes 18 estudiantes registraban grandes demoras, pues todos ellos solamente habían conseguido completar un porcentaje de la carrera inferior al 50%. Los 48 estudiantes dieron respuesta a un cuestionario

administrado personalmente, en un encuentro de uno a uno con el investi-gador, que les solicitó identificarse con uno de cinco estudiantes, cada uno orientado hacia metas distintas, en el momento del ingreso y en el momento de responder al instrumento. Los resultados mostraron que entre los estu-diantes con trayectorias de logro prevalecen desde el ingreso, y se sostienen cinco años después, metas de aprendizaje. En cambio, en aquellos estudiantes que tras cinco años de cursado en la universidad no habían aprobado aún el 50% de la carrera, prevalecían metas como salvar la autoestima y evitar el fracaso, asociadas con la adopción de conductas poco favorables para el aprendizaje.

Palabras clave: Trayectorias acadé- micas, logro, demoras en los estudios, metas, motivación.

INTRODUCTION

Year after year, universities admit large amounts of students whose objective is to have top performance throughout the program, as studies about characterization of students' desertion show (Guerrero, 2018; Solis, Moreira, Gonzalez, Fernandez, & Hernandez, 2018; Sparrow, Watanabe, & Jimenez, 2018; Vila*et a*l., 2019). However, shortly after, the initial group of contenders in each program starts disintegrating: some quit or others change programs; others fail to attain acceptable performance and lag behind, while some seem to follow the theoretical trajectory set by each program's study plan.

Without a doubt and as studies on the topic show, variables that affect a student's academic trajectory are both personal and contextual; moreover, they are multiple and can be combined and intertwined, resulting in diverse situations, as per the literature (Palacios-Pacheco, Villegas-Ch, & Lujan-Mora, 2019; Vila*et a*l., 2019; Zambrano, Albarran, & Salcedo, 2018).

The work herein intends to contribute knowledge to one of the factors that could affect the configuration of academic trajectories of achievement: attrition and graduation delays among engineering programs. Specifically, the role of the goals with which students face learning in university and its possible connection with achievement, or graduation delays, are analyzed.

SOME CONCEPTUAL CONSIDERATIONS

Study of Academic Trajectories. Achievement, Lagging Behind and Attrition

Learning is a complex and multidimensional process that has its own time frame. Each subject's personal and contextual variables help configure a particular type of path, road, journey or *academic trajectory* (Alban & Mauricio, 2019; Castellanos-Leal, Miranda, Martinez, Valdivieso, & Vera, 2019; Gama*et a*l., 2016; Rojas-Lopez & Garcia-Peñalvo, 2018).

In higher education, students' academic trajectories are varied and may or not fit those proposed by the program's study plan.

To explain this further, Terigi (2010) explains the difference between *theoretical academic trajectories* and *real academic trajectories*. The first

refer to those that follow the times set by the system in a stipulated period; while the latter are apart from theoretical or ideal trajectories, to a greater or lesser extent, since they are disturbed by life stories and contextual situations endured by each person.

Many young students' academic trajectories disagree with the times expected by the system, without even considering those who decide to interrupt and abandon. In our country and worldwide, there is growing concern for the quality of higher education and for the dissonance between massive entry and scarce graduation rates (Perez, Escobar, Toledo, Gutierrez, & Reyes, 2018; Umerenkova & Flores, 2017). According to Coronado and Gomez (2015) quite a few students make it to higher education. However, only over a half remains enrolled more than a semester or academic term, and many drop out or lose their way from those who remain.

The situation in the engineering program is not particularly different. Typically, engineering programs in Argentina (Perez*et a*l., 2018; Umerenkova & Flores, 2017; Taipe & Sanchez, 2018; Rocha, Zelaya, Sanchez, & Perez, 2017; Sparrow*et a*l., 2018; Vanegas-Pissa & Sancho-Ugalde, 2019) have a decreasing number of enrolled students, a reduced number of graduates, a slowed down journey of curricular trajectories and a noticeable attrition rate (Aparicio, 2009; Chiecher *et al*., 2011; Falcone & Stramozzi, 2011; Garcia *et al*., 2011; Panaia, 2011; Parrino, 2014).

A specific focus on the journey of students in higher education, particularly in Argentina, shows a lack of research on students that drop out, get lagged behind or change their choice in university. Two relevant national contributions are provided by the studies of Aparicio (2009) concerning lagging behind in university studies, and by the work of Coronado and Gomez (2015) on students' trajectories different variations: truncated trajectories and those of students who move towards the goal.

This outlook leads to a complex and multidimensional scenario, which needs to be studied closely and deeply, with the aim of answering the problem of attrition and lagging behind in engineering programs. In that regard, students' trajectories, in its different variations –achievement, lagging behind or attrition– represent an intricate map to be analyzed due to the multiplicity of intertwined causes that generate and define them (Aparicio, 2009; Parrino, 2005).

Motivation, Goals and Performance

Connections between motivation, learning and academic performance have a predominant space in the educational research agenda and have been extensively investigated. Students increasingly report being discouraged with their chosen program, they feel exhausted due to extreme demands and disappointed by unsatisfactory professional perspectives. While teachers complain of students' underperformance, lack of preparation at the moment of enrollment, lack of interest, among many others (Aparicio, 2008).

*Motivation*is usually presented as a decisive conditional element when referring to academic performance, and it is one of the main worries of teachers in different educational scenarios (Alonso, 2000; Bono & Huertas, 2006; Gonzalez, 2005; Paoloni *et al*., 2010).

Along with other variables, such as personal competences or learning strategies, academic motivation is one of the largest anticipating elements of a students' educational adjustment, i.e., provides access to understanding students' performance in class, whether to explain accomplishment or failures (Gonzalez, 2007; Aguilera and Bono, 2015). However, motivation implies not just expectations regarding one's actions, it is an active process that drives a person to focus and persist in one activity in order to fulfill certain goal. This is why motivational theories or approaches highlight the importance of *goals* in the motivational process. Each type of goal configures different motivational, cognitive and behavioral patterns. (Chiecher *et al*., 2016).

Huertas and Agudo (2003) describe five types of goals that students can adopt faced with academic tasks or situations:

• *Learning:* according to the authors, this goal is connected with top academic performance. The main objectives of students who decide to tackle learning tasks with this goal are related to the search of knowledge, personal improvement and enhancement of capacities. These students prefer new, challenging tasks that might contribute to increasing their knowledge on the topic; they possess intrinsic orientation towards learning, therefore, they are interested in learning and enjoy it.

• *Shining:* the real interest of students who opt for this goal is to impress and get great grades, positive evaluation from others, being compared with and standing out from their classmates. Learning is not an end in itself, but a means to reach another goal: a good image of themselves. Situations involving failure or uncertainty are a threat for their personal image, which is why they prefer tasks that allow providing a quick and correct question.

• *Avoiding failure:* these students share the same goal as those who aim to shine, but their motivational element is avoidance. They prefer to protect their capacities and self-esteem from the negative valuation of others, therefore, they seek to deliver obligations and make an effort to develop the tasks. The dangerous aspect is that they avoid difficulties, are constantly worried and any means is valid in order not to fail.

• *Avoiding complications:* students who chose this type of goal intend to be at ease, relaxed and happy. They do not stand out for their performance and are not interested in that. They manage their time and make just the right amount of effort needed to pass

• *Protecting self-esteem:* these students are worried about having the right image, preserving and protecting their self-esteem from peers and teachers. However, they are forced to adopt attitudes and behaviors that affect learning; they do not ask for help, sit at the back to go unnoticed, fail to express doubts to the teacher based on fear to be ridiculed, etc.

What motivates students? Which goals did they set for themselves when they began university and at the moment they provided the data

for this study? Are those goals the same? Are they stable or have they changed? How are these goals connected with the academic results attained by students?

These are some of the questions this study has set out to answer through an analysis of the goals and its implications in different educational trajectories.

METHODOLOGY

The study presented by this article proposes a retrospective reconstruction of the trajectories of students in engineering programs in a public Argentinian university, with the objective of acquiring in-depth knowledge of the goals that guided them at the time of entering university and after five years. In terms of Hernandez (2010), the design of this research is *longitudinal*, it collects data in different moments in time, previously defined by the researcher, in order to make inferences about changes observed, progress, cause and effect. These are fundamentally follow-up studies.

In the particular case of this work, it has sought to analyze any possible connection between goals and academic trajectories in university.

Participants in the Study

Forty-eight engineering students enrolled in a public Argentinian university participated in this study; they were contacted for data collection five years after entering university. Out of those students, 39 (81%) were male and only 9 (19%) female. Most were 22 years of age.

Fifteen of the forty-eight students were in senior year; another fifteen were somewhat lagging, although after five years, they had passed more than 50% of the program; finally, the remaining eighteen students were lagging behind extensively, as they had only managed to complete less than 50% of the program.

Data Collection Instrument

To collect the data related to the goals of university students at the time of entry and five years later (at the moment of contact) a motivational questionnaire was applied. This instrument –adapted by the research team based on contributions by Huertas and Agudo (2003)– gives the subject five accounts of hypothetical students which implicitly describe different styles of approach and of goals in learning situations *(learning, shining, avoiding failure, protecting self-esteem, avoiding complications).*

For instance, the following is an account that represents a student whose goals are oriented towards learning. The other accounts may be consulted accessing the online version of the questionnaire.˙.

> "Jose is a student that, in general, has good grades. He always attends classes and studies almost every day, simply because he likes what he does and specially

> to learn more. Sometimes he cannot dedicate as much time as he would like to each task, because he has different subjects. Yet, he makes an effort to learn something new every day. For him, the best strategy to face academic tasks is persistence, dedication, as well as good materials and enjoying studying. He thinks he is following his wishes and when he learns something new, he feels satisfied and proud of himself".

Students were requested to carefully read each of the five accounts and select: a) the account with which they identified the most at the moment of enrollment; b) the account with which they identified the most at the moment of answering the questionnaire -five years after enrolling in university-, and c) the account which they believed represented the ideal student.

Lastly, they were invited to briefly describe the reasons for their selection.

Analysis of the Data

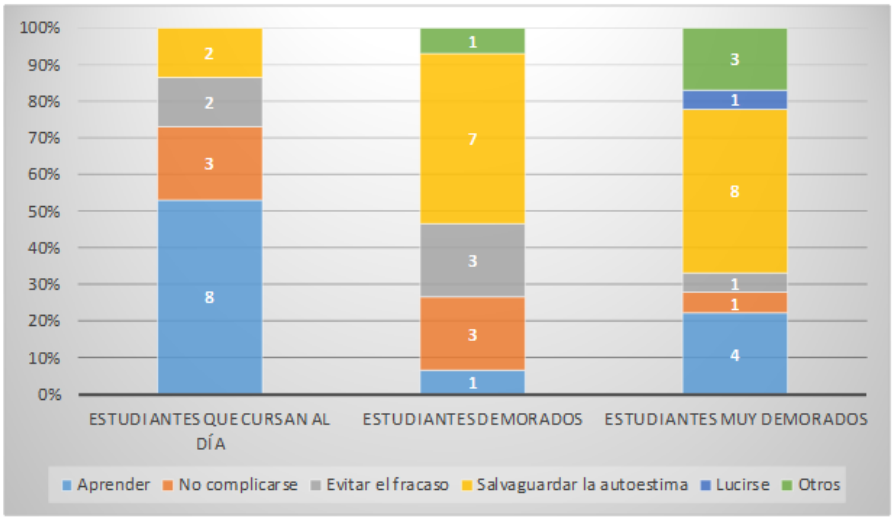
This article presents descriptive and comparative statistical analyses. As a result, the goals of three student groups are taken into account: 1) 15 students with successful journeys, whose actual trajectories match those theoretically set in their study plan; 2) 15 students with somewhat lagging trajectories (with over 50% of the program passed); 3) 18 students with very lagging trajectories (with less than 50% of the program passed).

RESULTS

This section explains the main findings consequent with the previously described questionnaire. Interesting differences were found among the groups being analyzed.

About the Goals Upon Entry to University

Graph 1 illustrates the goals with which students were identified upon their entry to university:



Graph 1.
Goals of the students upon their entry to university, as per the students' trajectory
Sours Source: compiled by the authors

In general terms, an analysis of the expressions used to justify the reasons for their chosen accounts evinced that these students believe persistency and dedication are the best strategies to be successful in the program's trajectory, aside from enjoying the activities in which they are engaged. Although they have experienced nervousness and uncertainty, they try to prevent these feelings to get in the way or negatively influence their goals. Some examples are:

> "I was not afraid of what would stand in my way. Regardless of the nerves caused by uncertainty, you try your best for them not to negatively affect your goals".

(Mechanical engineering student with achievement trajectory in the program)

> "It's been good for me due to persistence and dedication. I also like what I do".

(Mechanical engineering student with achievement trajectory in the program)

Another aspect to highlight of these students is that they mention they had had these types of goals since high school, which gave them a successful start in their undergraduate program.

In contrast, only 7% of the students somewhat lagging behind and 22% of those that were lagging behind extensively reported being oriented towards learning goals upon their entry to university. In fact, these groups of students showed an inclination towards the goal of protecting self-esteem upon the moment of entry, 47% and 53% respectively, this specific goal is not associated with outstanding performance.

For these students, the transition between high school and university was bumpy. They referred to it as *"stepping out of the comfort zone"* to enter something totally *"new and huge"*. They consider themselves to be *"very shy"*.

> "When you get into university, you leave your comfort zone and enter a new and huge environment; I used to be afraid of participating in classes to avoid making a fool out of myself".

(Electric engineering student, group of lagging students)

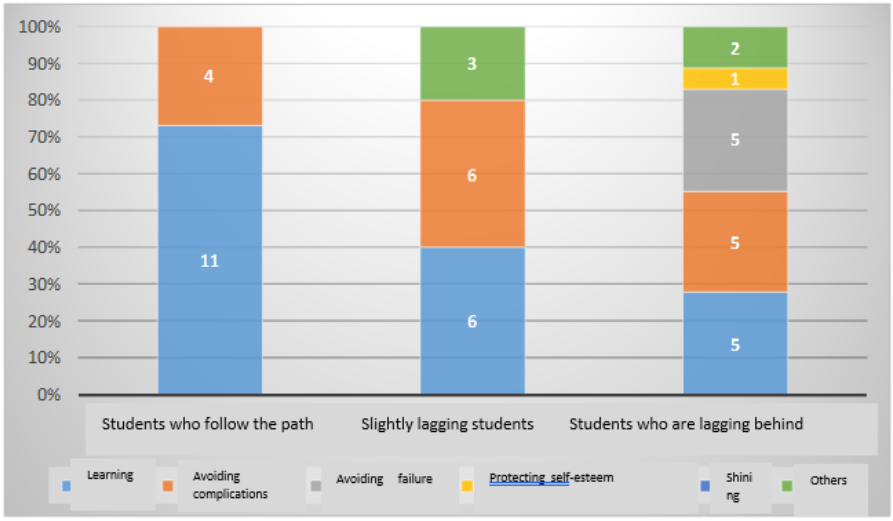
They also mentioned that they were very afraid to begin a new university undergraduate program; they were very careful not to "be embarrassed", precautions included sitting only with people they knew, delivering homework but without drawing too much attention, sitting in the back, avoiding asking the teacher, etc.

> "I used to behave like Matias, I tried not to intervene in case I was wrong and looked like a fool".

(Electrical engineering student, group of lagging students)

4.2. About the Goals Five Years After Entering University

Regarding the account selected when answering the questionnaire, five years after entering university, the results were as follows:



Graph 2.
Goals of the students five years after entering university, as per the students' trajectory
Source: compiled by the authors

It can be observed that the group of students with achievement trajectory concentrates the majority of subjects that are identified with the goal of learning (73%). Students who choose to face the tasks with this goal have objectives linked to seeking knowledge, improving themselves and enhancing their capacities. They have an intrinsic orientation towards learning; thus, they are interested and enjoy it. According to the literature, this type of motivational orientation is linked to top academic performance and this study can vouch for it (Huertas & Agudo, 2003).

These students –whose academic trajectories fit those theoretically set by the study plans– express that by the end of their program, they enjoyed learning and for them learning did not feel like a load or pressure. They thought they were persistent and dedicated, experiencing joy for what they did and admitted to having good results, which in turn, generated satisfaction. Some of the examples in their own words are:

> "It represents me the best, because in general I make an effort, I am persistent and I get good grades, I believe that being interested in what you study is critical to being satisfied with what you achieve".

(Chemical engineering studentwith achievement trajectory in the program)

> "I relate to Jose (the chosen account), he is the one who enjoys what he does and feels satisfied".

(Mechanical engineering studentwith achievement trajectory in the program)

Students who somewhat lagged behind show goals associated with learning and avoiding complications in the same percentage (40%). The goal of avoiding complications is not associated with high performance; in fact, that is not these students' objective. They intend to be at ease, relaxed and happy. They study according to their personal time, without haste or tensions. They make just the right amount of effort to pass and move forward without many complications (Huertas & Agudo, 2003).

Students who identified with this account of avoiding complications expressed that their main goal was to be happy, regardless of their results. They do not demand much from themselves and are not interested in competing; they rather study at a pace that is considered "reasonable"; grades do not matter as long as they are doing fine, they do not feel disappointed of failing at some point.

> "I study at my own pace, I care about grades as long as I'm doing fine. That way I am cool".

(Electrical engineering student, group of lagging students)

> I do not like being pressured into things, I would rather study at a reasonable pace and with a good study group.

(Electrical engineering student, group of lagging students)

On the other end, the group of students who are lagging behind extensively, only 28% selected the account linked to the goal of learning, a similar percentage (28%) chose the goal of avoiding failure.

The goal of avoiding failure is not frequently related to high academic performance, and although it can be expected in some situations such as entering university (in which the student faces the challenge of learning new knowledge typical of the chosen discipline) adapting to a new institution with its own rules, codes and times, and in some cases, to a new city and to living with strangers, the presence of this goal in students who have been in university more than five years is at the very least striking.

> "I feel identified with the frustrations and feelings that exams make me feel".

(Telecommunications engineering, group of students lagging behind extensively)

> "I am insecure, I feel afraid of failing and lagging behind, but I always try my best with the help of my family and classmates".

(Electrical engineering student, group of students lagging behind extensively)

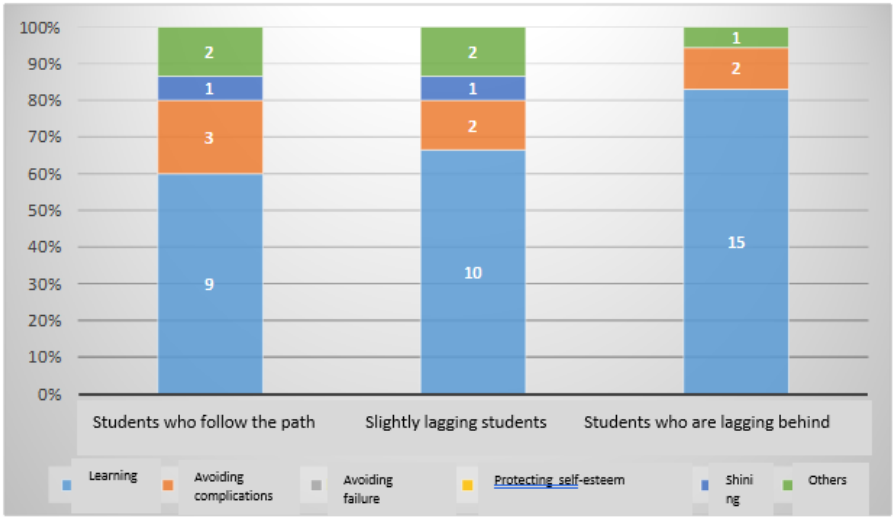
In terms of the goals of avoidance, the authors affirm that subjects who are guided by fear of failure are insecure, do not feel capable of being successful in activities and often experience instability and anxiety. Unlike subjects who are oriented towards learning, who enjoy it and engage in challenging activities, students oriented by fear of failure chose to get involved only in simple tasks, which guarantee they will not fail even if they do not learn much (Huertas & Agudo, 2003).

It seems like negative results have left a bitter taste on students. They express that fear and insecurity overrun them whenever they face an exam, which makes them struggle under the pressure of failing, or worse, to get even more behind.

This provides a glimpse into how frustrating the five years of university must have been for subjects in the group lagging behind extensively, always accompanied by negative emotions of restlessness, anxiety, fear of failure, without even managing to pass 50% of the program.

About the Goals of the Ideal Student

The three groups considered that learning goals are the most suitable to undertake studies. Yet, the highest percentage may be observed among the students that are lagging behind extensively (83%), precisely those who had selected less of this type of goals in previous items. This means that they know the ideal student differs from the student they really are.



Graph 3.
Goals of the ideal student, as per the students' trajectory
Source: compiled by the authors

What this group expresses about the ideal student is that he/she tries to achieve balance. They study not just for the grades, but also for learning and self-interest, to have human and moral training; he/she enjoys studying, is persistent and is not defeated by adversity, moreover, he/she is sure of the choice made.

FINAL CONSIDERATIONS

This article proposes studying the goals and motivations associated with academic accomplishment and lagging behind in studies of students in the class of 2012 in the programs of engineering, five years after starting the program, a time in which, according to the study plans, they should have concluded their studies.

Three groups of students are approached from a comparative perspective: 1) those who managed to have successful journeys and whose academic trajectories match the time frame set in the study plan; 2) students somewhat lagging behind, with more than 50% of the program passed; and 3) students lagging behind extensively, with less than 50% of the program passed after five years in university.

Results show that, indeed, good academic performance is linked to learning goals, sustained from the beginning to the end of the journey. To such extent, that when thinking about the ideal student, all of the groups agreed that this type of goal was the key for learning and good performance.

When students were asked to identify their orienting goals at the beginning of the program, students with best performance –meaning those who had followed the pace set by the study plan– mostly identified with learning goals. Even more so, not just at the moment of entering university (53%), but at the moment of answering the questionnaire, five years after beginning their program (73%).

Students who are intrinsically oriented towards learning enjoy it and take pleasure in enhancing their capacities. They prefer tasks to be innovative, to challenge them into acquiring new knowledge. As stated earlier, in specialized literature, these motivational preferences are linked to good academic results.

Among students somewhat lagging behind and those extensively lagging behind only 7% and 22%, respectively, identified themselves with learning goals at the moment of entry to university. On the contrary, in these group of students, goals oriented towards protecting self-esteem prevailed upon arrival to university.

This concern to protect their image and evade negative results usually leads students to adopt behaviors that fail to benefit learning, such as refusing to ask for help, being unnoticed in class, not asking questions to avoid embarrassment, among others. This is clear in this group's academic results.

Although it can be expected in situations such as entering university (in which the student faces an unknown universe that requires them to relate differently to knowledge and to develop strategies to adapt to the chosen discipline) adapting to a new institution with its own rules, codes and times, and in some cases, to a new city and to living with strangers, the presence of this goal in students who have been in university more than five years is at the very least striking, surprisingly after that time the goals of learning and avoiding failure prevail to the same extent (28% in each case).

The goal of avoiding failure is accompanied, overall, by negative emotions of restlessness, anxiety and fear; which provides a glimpse into how unpleasant the five years of university must have been for subjects in the group lagging behind extensively.

Now, how can we help students attain goals that are oriented towards learning? How to tackle academic underperformance? How to avoid unexpected results by these students to affect their self-image? These are some questions identified in light of this situation.

There seems to be an overall consensus about how academic performance of students in every academic level is affected and influenced by multiple interrelated factors (Vazquez *et al*., 2012). In that sense, Garcia *et al*., (2014) add that underperformance is associated with the student's personal factors and with pedagogical issues.

The student's personal variables include socio-demographic, familial, motivational, cognitive and emotional studies. The pedagogical aspects encompass the teacher's attitudes and expectations, training, experience, personality, class climate, etc.

This author also says that the aspects that are the hardest to change are the socio-demographic and familial; however, those connected to motivation, cognition and handling emotions can be addressed with teaching support.

Interestingly, motivation is considered a personal variable of each individual, yet it can be influenced by the context, be it institutional or by the teacher. Assuming this perspective, it could be said that it is possible to have a bearing on goals set by each student when dealing with different learning situations.

While each student enters university with particular ideas about what learning entails, often associated with individual motivational patterns, it is possible to design proposals in the university context, aimed at promoting learning goals that encourage motivation, interest and joy for learning, consequently benefiting the fulfillment of more successful academic trajectories.

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