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INFLUENCE OF ADAPTATION AND SELF-EFFICACY ON DROPOUT AMONG HIGHER EDUCATION STUDENTS¹

Influência da adaptação e da autoeficácia no abandono de estudantes do ensino superior

Influencia de adaptación y la autoeficacia en el abandono escolar de los estudiantes de Enseñanza Superior

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Abstract: Entering higher education, combined with the context of the pandemic and remote classes, may affect both academic adaptation and self-efficacy, and consequently influence students' decision to drop out. This study aimed to assess academic adaptation, self-efficacy beliefs in higher education, and the characteristics of students in situations of dropout. Data were collected from 377 first-year students enrolled in Administration, Design, and Engineering programs, through a sociodemographic questionnaire, the reduced version of the Academic Experience Questionnaire (QVA-r), and the Higher Education Self-Efficacy Scale (AEFS). Low academic adaptation proved to be a determinant of dropout, and students who dropped out presented lower self-efficacy beliefs in higher education compared to those who remained enrolled. The findings reinforce the conceptual relationship between these constructs and student persistence in higher education.

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Keywords: higher education; self-efficacy; dropout.

Resumo: A entrada no ensino superior, aliada ao contexto de pandemia e aulas remotas, pode afetar tanto a adaptação acadêmica quanto a autoeficácia e, conseqüentemente, influenciar a decisão de abandono escolar. O presente trabalho teve como objetivo avaliar a adaptação acadêmica, as crenças de autoeficácia no ensino superior e as características dos estudantes em situação de evasão. A coleta de dados foi realizada com 377 ingressantes do primeiro ano dos cursos de Administração, Design e Engenharia, por meio de um questionário de dados sociodemográficos, do Questionário de Vivências Acadêmicas – versão reduzida (QVA-r) e da Escala da Autoeficácia na Formação Superior (AEFS). A baixa adaptação acadêmica pode ser determinante para o abandono escolar, e os evadidos apresentaram menores crenças de autoeficácia na formação superior quando comparados aos que permaneceram no curso. Os resultados reforçam a relação conceitual entre os construtos e a permanência dos estudantes no ensino superior.

Palavras-chave: ensino superior; autoeficácia; evasão escolar.

Resumen: El ingreso en la enseñanza superior en el contexto de la pandemia y las clases a distancia puede afectar tanto a la adaptación académica como a la autoeficacia y, en consecuencia, influir en la decisión de abandonar los estudios. El objetivo fue evaluar la adaptación académica, creencias de autoeficacia en la enseñanza superior, características de los estudiantes y situación de abandono. Se recogieron datos de 377 estudiantes de primer curso (Administración de Empresas, Diseño e Ingeniería) mediante un cuestionario de datos sociodemográficos, Cuestionario de Experiencias Académicas - versión reducida (QVA-r), y Escala de Autoeficacia en la Educación Superior (AEFS). La reducción de la adaptación académica puede ser un factor determinante en el abandono escolar y los que abandonaron tenían creencias de autoeficacia en la educación superior más bajas en comparación con los que permanecieron. Los resultados refuerzan la relación conceptual entre los constructos y la permanencia en la enseñanza superior.

Palabras clave: educación superior; autoeficacia; abandono escolar.

1 INTRODUCTION

Entering university opens opportunities for fulfillment and satisfaction within the academic environment. Students with good adaptation and self-efficacy are more likely to develop the skills required in their field. However, the transition to higher education (HE) may lead to difficulties, whether in adapting to a more demanding level of study or in building a new social network of friendships (Santos; Zanon; Ilha, 2019). Enrollment in HE represents a significant stage in students' lives, in which they face challenges and seize opportunities for developing technical and scientific skills, as well as personal and transversal competences that contribute to their psychosocial development (Casanova; Araújo; Almeida, 2020).

In summary, self-efficacy directly affects variables that predict academic performance and factors that help explain student persistence in higher education, such as academic achievement, satisfaction with the program, and intention to continue the educational pathway. At the same time, personal variables influence both self-efficacy and students' performance and persistence at university (Fior *et al.*, 2022b). Based on this evidence, the present study aimed to examine the influence of adaptation, self-efficacy, and individual characteristics on dropout among higher education students. The following section presents the theoretical framework that underpins this study.

2 THEORETICAL FRAMEWORK

Self-efficacy is defined as the act of judging one's own abilities, with confidence in them, to achieve a given level of performance in an activity. Beliefs in self-efficacy arise from mastery experiences, in which outcomes considered positive reinforce such beliefs (Bandura, 1986). It is important to assess students' convictions, especially among freshmen, since academic success is built on self-efficacy (Tinto, 2017). In this regard, studies have confirmed significant relationships between self-efficacy, academic integration (adaptation), intellectual development, and academic performance among first-year undergraduates. Evidence also indicates that general and academic self-efficacy are slightly higher among students receiving financial aid, whereas those who do not benefit from such support depend not only on internal resources (such as self-efficacy) but also on external resources (such as academic integration) for the development of their academic self-efficacy, academic growth, and academic performance (Hakyemez; Mardikyan, 2021). Academic self-efficacy explained a large proportion of the variance in overall academic satisfaction (approximately 64%), with the social interaction dimension presenting a high regression coefficient ($\beta = 0.79$; $p < 0.001$). These results demonstrate that self-efficacy is a strong predictor of academic satisfaction and that students with greater social self-efficacy tend to show higher satisfaction with their chosen program (Santos; Zanon; Ilha, 2019).

Adaptation to the university environment entails several changes, some requiring the adjustment of new habits and others the incorporation of new behaviors and knowledge. New study methods are required to meet curricular demands, new

knowledge must be acquired, and greater maturity in interactions with peers and professors is expected (Soares; Del Prette, 2015). Adaptation to HE must be analyzed considering multiple influencing factors, such as professional and personal development, relationships with professors, learning, and the use of institutional services, such as academic support programs (Casanova; Araújo; Almeida, 2020). Many students begin higher education with a sense of achievement and victory upon entering their desired program. However, some face difficulties in coping with academic situations and tasks, taking on commitments, and fulfilling vocational needs and projects, which requires mobilizing personal resources already developed or to be acquired within the university setting (Casanova *et al.*, 2018a; Soares; Del Prette, 2015).

Within this challenging context, most students experience entry into HE satisfactorily and with curiosity. For some, however, the first weeks in HE are marked by tension and anxiety and, in some cases, frustration in light of initial expectations and aspirations (Casanova; Bernardo; Almeida, 2021). High stress levels may alter how freshmen perceive the opportunities offered by the university, whether for personal or professional development (Sahão; Kienen, 2021). Better levels of academic adaptation have been correlated with improved sleep quality and lower stress levels (Souza; Murgo; Barros, 2021). In addition to academic challenges, students also face difficulties related to their developmental stage. The transition to higher education coincides with the passage from adolescence to adulthood. In the pursuit of favorable academic results, students undergo cognitive, emotional, and behavioral transformations throughout their undergraduate studies.

Difficulties may stem from insufficient background or knowledge in relevant curricular areas, unfamiliarity with teaching and assessment methods, lack of course manuals, and the demand for greater organization and commitment in managing study time and tasks. Research indicates that such learning difficulties, and consequently academic performance, are often linked to prior academic trajectories. For example, associations have been found between fragile schooling trajectories and the occurrence of retention, lower grades, academic failure, and dropout (Casanova; Bernardo; Almeida, 2021). Nevertheless, the intention to drop out may be diagnosed before the actual decision to withdraw (Carlotto; Câmara, 2022).

Student dissatisfaction during the transition and adaptation to HE, and the subsequent dropout, may be explained by psychological, sociological, economic, and institutional factors (Casanova, 2018). Academic performance is not the primary predictor of dropout, since many students with low performance decide to persist due to other factors, such as emotional attachment. Thus, the set of factors involving student interactions and performance must be considered in order to justify or predict the decision to withdraw from higher education (Alkan, 2014). Personal aspects have a stronger impact on the decision to drop out than on performance (Fior *et al.*, 2022a). However, the literature consistently indicates that students with lower academic performance are more likely to withdraw (Fior *et al.*, 2022a; Casanova *et al.*, 2018a; Ferrão, 2022; Matta, 2019; Tinto, 2017). Academic performance is described by grades

and scores obtained, course completions, and earned credits, which provide information on students' progress throughout their program (Casanova *et al.*, 2018a).

Student dropout in higher education (HE) is a problem that affects public and private institutions worldwide. In the public sector, invested resources fail to produce the expected return. In private HE institutions, dropout may lead to a significant reduction in revenue (Matta; Lebrão; Heleno, 2017). Withdrawal symbolizes failure on the part of students, their families, and the institutions themselves, especially when it is definitive (Casanova, 2020). Several theories attempt to explain the reasons why students interrupt or continue their studies, most frequently citing economic, social, and psychological factors (Alkan, 2014). Research indicates that dropout may be related to the university environment but also to non-academic factors (Matta; Lebrão; Heleno, 2017). This study assumes that students who persist are those who maintain a connection with the program, while dropouts are those who leave before completing it, whether by personal initiative or institutional circumstances.

Another study points out that limited knowledge about the chosen program, uncertainties regarding career opportunities, students' financial difficulties, low academic performance, and the need to balance study and work are among the most frequently cited reasons for dropout in HE (Santos, 2021). Academic overload, financial constraints, difficulties assimilating content, interpersonal conflicts, family issues, unsatisfactory teaching practices, and academic failure have been identified as academic stressors, for which students adopt palliative strategies (Abacar; Aliante; António, 2021). Burnout syndrome, low satisfaction with the program, and the stressor "too many courses to complete" were cited as predictors of dropout intention, with satisfaction with the program mediating the relationship between burnout and the intention to withdraw (Carlotto; Câmara, 2022).

Casanova (2018) reported that the first year in HE appears to be the decisive period for intervention, promoting success and preventing student withdrawal. The first weeks of university attendance are essential for academic and social integration and for institutional support. Promoting opportunities and activities for student socialization, as well as collaboration with student, community, sports, and religious associations, in addition to institutional measures to support students' financial needs (such as scholarships, merit awards, or part-time jobs within the institution), are equally important. Finally, learning and academic engagement are reinforced by the adoption of continuous assessment methods, which increase professor-student interaction, classroom attendance, and systematic study. However, persistence and completion of higher education depend significantly on the investment students dedicate to their academic training.

Time management plays a key role in improving academic performance and interpersonal relationships, thereby reducing dropout. The first aspect relates to how students organize their time to optimize the efficient completion of academic activities. The second concerns their perception of friendship and cooperation among peers and relationships with professors. Extracurricular activities, internships, and support networks composed of family, friends, and professors, together with interpersonal

relationships within the university environment, foster academic adaptation (Bardagi; Hutz, 2012; Ambiel; Santos; Dalbosco, 2016). The literature indicates that interpersonal relationships and personal and social adjustment can enhance academic performance and help prevent or postpone dropout, as can student support services (Matta; Lebrão; Heleno, 2017; Soares; Del Prette, 2015).

Support networks formed by friends and family provide students with a sense of security, enabling them to cope with the challenges of university life. "In this case, students' psychosocial development unfolds positively and may lead to better personal, interpersonal, institutional, and vocational adjustment in the academic context" (Soares; Del Prette, 2015, p. 142). Social support from professors influences student adaptation and persistence (Vieira-Santos *et al.*, 2019). Students themselves have highlighted the importance of professors acting both at the theoretical-didactic level, through the transmission of knowledge and experiences and by encouraging discussions, and at the interpersonal level, by being open to dialogue and concerned with academic adaptation and student development, assisting them with career guidance (Oliveira *et al.*, 2014, p. 245). Professors have also been identified as mediators of stress among students, particularly those facing financial hardship (Hakyemez; Mardikyan, 2021).

Vocational issues are also decisive for persistence or dropout, especially students' professional motivation and goals (Casanova *et al.*, 2018a; Ambiel; Santos; Dalbosco, 2016). Students who enter programs as their first choice demonstrate more positive perceptions of self-efficacy and higher expectations of overcoming difficulties (Casanova *et al.*, 2018a). HE institutions are therefore expected to invest in student persistence by ensuring favorable conditions for relationships and overall well-being (Ambiel; Santos; Dalbosco, 2016; Hakyemez; Mardikyan, 2021), while also offering opportunities for the development of career decision-making skills (Ambiel; Santos; Dalbosco, 2016).

Tinto (2017) argues that academic experiences may influence students' motivation and effort, thereby supporting persistence. He proposes a model that assesses the impact of motivation, resulting from the interaction among students' goals, self-efficacy, sense of belonging, and perceptions of curriculum quality and relevance, on persistence until graduation. Another study concluded that integration, or academic adaptation, constitutes a psychological process that promotes the development of intrinsic motivation for learning and, as a consequence, persistence in the program (Vergara-Morales; Dell Valle, 2021).

Institutional management actions, supported by professors and staff, aimed at promoting student communities on campus may foster the self-sustainable development of student groups. Such communities promote students' sense of belonging to the institution, reflecting social diversity, cooperation in learning, and the sharing of academic and social experiences. Together with goals, perceived individual success (self-efficacy), and the value attributed to the academic curriculum, these factors may motivate students to remain in their programs (Tinto, 2017). A solid understanding by HE administrators of the impact of student diversity on academic

performance is crucial for monitoring these groups and creating an academic and social environment that meets their diverse needs (Hakyemez; Mardikyan, 2021; Bitencourt; Silva; Xavier, 2022).

In light of the literature review, each institution must develop its own pedagogical philosophy and policies, planning measures to address risks and/or dropout situations. Educational and school psychologists may play an essential role within HE institutions by supporting the design of life projects for each student and providing services consistent with governmental and institutional priorities (Barroso *et al.*, 2022). However, given the increasing heterogeneity of student profiles and the need to understand variables associated with success, the present study proposes to examine the influence of adaptation, self-efficacy, and individual characteristics on dropout among higher education students.

The challenges faced by freshmen during the data collection period of this study were aggravated by the pandemic caused by SARS-CoV-2, a viral infection that spread worldwide. Students had to deal with fear, uncertainty, and remote classes imposed by the pandemic, which represented an additional obstacle to their academic trajectory and, consequently, to their educational outcomes. According to Zanini, Rossato, and Scorsolini-Comin (2023), students were required to adapt to a new life routine, which was not always positive and demanded multiple types of change. The transition from face-to-face to remote learning was experienced in different ways, depending on each student's emotional condition, capacity for adaptation, available resources, and home environment, among other contextual factors.

3 METHODOLOGY

3.1 Participants

A non-probabilistic convenience sample was used, with inclusion criteria being: first-year students enrolled in the Tutoring course offered to freshmen in 2021. The study included 377 first-year students from Engineering (88.1%), Business Administration (3.7%), and Design (8.2%) programs at a private institution in the state of São Paulo. The average age was 18.2 years ($SD = 1.4$), with the majority being male (74.3%), enrolled in daytime classes (93.2%), graduates of private high schools (92.1%), not employed or interning (87.7%), and financially supported by their families (86.4%). Most of the students' parents had completed higher education (77.5% of fathers and 83.2% of mothers).

3.2 Instruments

Sociodemographic Questionnaire. This instrument collected information on gender, age, program, type of high school attended (public or private), funding source for higher education (personal/scholarship, family, or student loan), employment status (not employed, employed in program-related field, employed in unrelated field), and parents' educational level, in order to identify students' individual characteristics.

Reduced Academic Experience Questionnaire (QVA-r). This instrument, used as a global measure of academic adaptation (Almeida; Soares; Ferreira, 2002; adapted version by Granado *et al.*, 2005), consists of 55 items distributed across five dimensions: personal, interpersonal, career, study, and institutional. It employs a five-point Likert scale, ranging from "1 – Does not apply to me" to "5 – Applies completely to me." Examples include: "I cannot concentrate on a task for long" and "I believe I can fulfill my values in the profession I have chosen." Mean scores were used, with higher values indicating higher levels of academic adaptation.

Higher Education Self-Efficacy Scale (AEFS; Polydoro; Guerreiro-Casanova, 2010). This 34-item scale assesses students' perceived ability in relation to different aspects of higher education experience. It uses a ten-point Likert scale, ranging from 1 (very little) to 10 (very much), distributed across five dimensions: academic self-efficacy, self-efficacy in regulating one's education, social interaction self-efficacy, proactive self-efficacy, and academic management self-efficacy. Example items include: "To what extent am I able to demonstrate, in assessment situations, what I have learned during my program?" and "To what extent am I able to make decisions related to my education?" Mean scores were used, with higher values indicating greater self-efficacy in higher education.

The selected instruments demonstrated good reliability in this study, with Cronbach's alpha values above 0.76 for the QVA-r and 0.95 for the AEFS.

3.3 Procedures

This is a descriptive and cross-sectional study, conducted after approval by the Research Ethics Committee (CAAE: 36281020.0.0000.5508). Participants were informed about voluntary participation and the objectives of the study, instructed regarding data collection procedures, and assured of confidentiality and anonymity. All participants provided informed consent. The questionnaires were administered in 2021 during a synchronous remote class in the first-year course, lasting approximately 40 minutes.

Students' academic status (enrolled or withdrawn) was obtained at the end of the academic year following questionnaire administration, through spreadsheets provided by the university. These data, along with responses from the Sociodemographic Questionnaire, AEFS, and QVA-r, comprised the database for statistical analyses, conducted using the Statistical Package for the Social Sciences (SPSS), version 22.0.

In characterizing the sample, group means were compared using Student's t-test or analysis of variance (ANOVA). Groupings were discriminated by gender, program, employment status, main funding source, type of high school (public or private), and parents' educational level. Associations among age, self-efficacy, and academic experiences were analyzed: the direction and strength of associations were examined through Spearman's rank-order correlation (ρ), a nonparametric test applied when variables did not follow a normal distribution. Correlation coefficients, in absolute value, range from 0 (no relationship between variables) to 1 (perfect relationship). Regarding strength of association, values between 0.90 and 0.70 are considered strong; between 0.69 and 0.40, moderate; and between 0.39 and 0.10, weak (Dancey; Reidy, 2013). The

association between dropout and sociodemographic characteristics was evaluated using the Chi-square test.

The dropout model was tested using logistic regression analysis, as dropout is a dichotomous variable. In this study, the dependent variable was dropout, while independent variables included student characteristics, dimensions of academic experiences, and self-efficacy. The significance level adopted for the tests was 5%.

3.4 Results e Discussion

At the end of the academic year, 41 participants (11%) had dropped out, characterized by course withdrawal without completion. Most were Engineering students, as this was the largest program in the institution. No significant difference was found in the mean age of students who dropped out compared to those who remained enrolled ($p = 0.700$). Chi-square tests indicated, marginally, no dependence between dropout and gender ($X^2 = 2.22$; $p = 0.136$), program ($X^2 = 2.15$; $p = 0.341$), public or private high school background ($X^2 = 0.17$; $p = 0.676$), employment status ($X^2 = 0.15$; $p = 0.930$), different funding sources ($X^2 = 2.22$; $p = 0.528$), fathers' educational level ($X^2 = 3.65$; $p = 0.455$), and mothers' educational level ($X^2 = 2.22$; $p = 0.696$).

Consistent with this study, other authors have also found no significant association between dropout intention and parents' educational level. However, higher dropout intention was reported among students whose parents had only basic education (Casanova *et al.*, 2018b). Thus, students with greater dropout intention tend to have parents with lower levels of education (Casanova; Bernardo; Almeida, 2021).

4 ACADEMIC ADAPTATION AND SOCIODEMOGRAPHIC CHARACTERISTICS

In the QVA-r, the overall mean score was 3.6 (SD = 0.4), which indicates good student adaptation during the pandemic and remote learning period, considering that in the same institution the overall mean of this instrument had been 3.7 in the pre-pandemic phase (Matta, 2019). Table 1 presents the descriptive analyses of the QVA-r dimensions, with information on mean scores and dispersion.

Table 1 – Descriptive analyses of the dimensions of academic experiences (AE)

Dimensions	n	Minimum	Maximum	Mean	SD
Personal	373	1,21	4,79	3,11	0,69
Interpersonal	373	1,33	5,00	3,50	0,73
Career	368	1,92	5,00	3,97	0,53
Study	370	1,22	4,67	3,37	0,61
Institutional	361	2,25	5,00	4,00	0,50
Overall	344	2,06	4,49	3,59	0,43

Source: authors' elaboration

Analysis of Table 1, based on the mean scores of the questionnaire dimensions, highlights students' high satisfaction with both the institution attended and the chosen career. At lower levels, interpersonal relationships in the university environment and perceptions of study habits were noted, results expected during remote learning and the lack of in-person social interaction. Standard deviation values, ranging from 0.50 to 0.73, confirmed the homogeneity of responses in the sample. The Kolmogorov–Smirnov test indicated lack of normality in the QVA-r dimension data.

The lowest mean was observed in the personal dimension, slightly above the scale's midpoint, denoting reduced perceptions of physical and psychological well-being and self-confidence, possibly as a result of the pandemic. This period represented entry into a context of uncertainty, requiring individuals to reorganize their daily routines. Even in situations where participants were better prepared for social distancing/isolation, there were still declines in optimism, well-being, and psychological aspects. Zanini, Rossato, and Scorsolini-Comin (2023) described that the way individuals experienced the effects of the pandemic and the new routine was specific to each person, depending on their internalized coping resources.

When comparing academic adaptation scores by gender, type of high school (public or private), employment status, different funding sources, and parents' educational levels, no significant differences were found. However, analysis of QVA-r dimensions by gender showed differences in the personal and study dimensions: men perceived themselves in better condition regarding psychological and well-being factors, whereas women perceived themselves with better study habits (Table 2).

The literature reports gender disparities and suggests that study habits and investment in academic tasks differ between men and women, with women organizing academic activities more effectively, which results in higher grades. Men engage more frequently in extracurricular activities (Al-Sheeb *et al.*, 2019; Fior *et al.*, 2022a) and, consequently, perceive themselves as in better condition regarding physical and psychological aspects. Fior *et al.* (2022b) also reported higher levels of procrastination among men, with increased daily study compared to exam-focused study, suggesting that postponement is more present in everyday academic tasks than in formal institutional demands, which are tied to grades and may have greater impact on academic progression. These findings support the interpretation of the present study, since men showed lower adaptation in the study dimension, partially explained by procrastination and extracurricular involvement.

Table 2 – Comparison of QVA-r dimensions and significant variables: gender and funding sources

AE Dimension	Variables	n	Mean	SD	P-Value*
Personal	Female	89	2,9	0,7	0,000
	Male	282	3,2	0,7	
Estudy	Female	89	3,6	0,6	0,000
	Male	279	3,3	0,6	
Personal	Own resources	3	3,26	0,7	0,035
	Family resources	326	3,13 ^a	0,7	
	Scholarship	26	3,21 ^b	0,7	
	Student loan	18	2,66 ^{a,b}	1,0	

* p-value based on Student's t-test and ANOVA (for group comparisons). Different letters indicate groups that differ at the 5% significance level ($p \leq 0,05$).

Source: authors' elaboration

Table 2 shows reduced perceptions of personal adaptation among students with student loans. This reduction in physical and psychological well-being may be explained by family financial difficulties and the debt assumed with the university, referring to tuition fees to be paid in installments after graduation. It should be noted that socioeconomic factors can determine students' cultural capital (prior to entering HE), academic performance, and dropout risk (Matta, 2019).

The Kolmogorov–Smirnov normality test was applied to the scale dimensions and the age variable of participants. Results rejected the hypothesis of data normality ($p < 0.05$). Thus, based on Spearman's correlation, no significant correlation was found between age and any of the dimensions of academic experiences – QVA-r ($p > 0,05$).

4.1 Self-efficacy and sociodemographic characteristics

In the AEFS, the overall mean self-efficacy score was 7.6 (SD = 1.12), classified as high in the context of the pandemic and social isolation. This result was close to the mean of 7.5 obtained prior to the pandemic at the same institution (Matta, 2019). A study comparing indicators in two periods, pre-pandemic (2019) and during the pandemic phase (2020), showed a significant decrease in academic self-efficacy beliefs and alcohol consumption among students during the quarantine period (Zanini; Rossato; Scorsolini-Comin, 2023). Other findings suggest that academic self-efficacy and academic and intellectual development are positively associated with academic performance (Hakyemez; Mardikyan, 2021).

Table 3 presents the descriptive analyses of the AEFS dimensions, including mean scores and data dispersion. According to the Kolmogorov–Smirnov test, the AEFS dimensions did not show normality. The highest scores were related to beliefs in academic management ability, learning and demonstrating content, and social interaction. It is important to note that these results were obtained during the remote learning phase,

when many assessments were carried out in groups, which partly favored students' social interaction and collective academic management.

Table 3 – Descriptive statistics of self-efficacy dimensions (AEFS)

Dimensions	n	Minimum	Maximum	Mean	SD
Academic	371	1,78	10,00	7,72	1,17
Regulation of education	373	1,71	10,00	7,37	1,38
Social interaction	374	2,57	10,00	7,60	1,44
Proactive actions	369	3,14	10,00	7,03	1,39
Academic management	370	1,25	10,00	8,10	1,43
Overall	365	3,00	9,75	7,57	1,12

Source: authors' elaboration

The lowest mean was found in the proactive actions dimension, which is understandable for freshmen, given the difficulty of taking advantage of educational opportunities and self-regulating career-related actions, especially considering the transitions they faced: from high school to higher education, from adolescence to young adulthood (also highlighted by Pascarella and Terenzini, 2005), and from the expectation of in-person learning to the reality of remote instruction.

No significant differences were found between overall self-efficacy scores and the students' sociodemographic characteristics included in the study. However, when comparing the dimensions by gender, women reported higher levels of self-efficacy in academic management, indicating that they perceived themselves as more confident in planning tasks and meeting deadlines (Table 4), consistent with findings from other authors (Fior *et al.*, 2022a). In the program comparison, Design students reported higher confidence in their ability to learn and apply content compared to Engineering students (Table 4), which may be explained by the smaller number of individual assessments in the Design program. Barroso *et al.* (2022) reported a higher probability of dropout in exact sciences programs, such as Engineering, due to the need for greater study dedication, a larger number of assessments, and lower academic performance.

In contrast, employment status, funding sources, and parents' educational level did not differentiate students' self-efficacy (in overall or dimensional scores), nor was any association found between age and self-efficacy dimensions ($p > 0.05$). Conversely, another study suggested that student financial support increased general and academic self-efficacy levels, while students without such support relied on academic adaptation for building self-efficacy and on academic and intellectual development to achieve good academic performance (Hakyemez; Mardikyan, 2021).

Table 4 – Comparison of AEFS dimensions and significant variables

Dimension	Variable	n	Mean	SD	p-value*
Management	Female	90	8,4	1,3	0,015
	Male	278	8,0	1,5	
Academic	Engineering	328	7,7*	1,2	0,048
	Business	14	7,9	1,0	
	Design	29	8,2*	0,8	

Note,

* p-value based on Student's t-test and ANOVA (for comparison of more than two groups).

Source: authors' elaboration

It is understood that self-efficacy beliefs establish the level of effort a person invests in a given activity and their resilience in the face of unexpected events (Bandura; Azzi; Polydoro, 2008). These beliefs proved fundamental for entering higher education, particularly during the pandemic and remote learning period.

4.2 Comparisons of academic experiences and self-efficacy with dropout

Students who remained enrolled and those who dropped out presented significantly different mean scores on the overall QVA-r ($p = 0.000$), indicating that those who persisted had better adaptation. This result was also confirmed in comparisons of the instrument's dimensions (Table 6): dropouts reported lower scores in all areas of academic experience, revealing reduced personal, interpersonal, career, study, and institutional adaptation compared to those who remained. Similarly, other studies have confirmed significant relationships between academic adaptation (integration), intellectual development, academic performance, and dropout decisions among first-year university students (Hakyemez; Mardikyan, 2021; Matta, 2019). Extracurricular activities, internships, and support networks composed of family, friends, and professors, together with interpersonal relationships in the university environment, favor academic adaptation and could have prevented or delayed dropout (Ambiel; Santos; Dalbosco, 2016; Bardagi; Hutz, 2012; Matta; Lebrão; Heleno, 2017; Soares; Del Prette, 2015; Vieira-Santos *et al.*, 2019). However, such opportunities were likely less accessible during social isolation.

Table 6 – Comparative analysis of QVA-r mean scores of students who remained enrolled and dropouts

Dimensions	Variables	n	Mean	SD	t	p-value*
Personal	Persisted	332	3,15	0,68	2,671	0,008**
	Dropped out	41	2,84	0,76		
Interpersonal	Persisted	332	3,53	0,71	2,730	0,007**
	Dropped out	41	3,21	0,82		
Career	Persisted	327	3,99	0,52	2,328	0,020**
	Dropped out	41	3,79	0,59		
Study	Persisted	330	3,40	0,60	2,491	0,013**
	Dropped out	40	3,15	0,64		
Institutional	Persisted	321	4,04	0,46	4,025	0,000**
	Dropped out	40	3,63	0,63		

* p-value based on Student's t-test for two-group comparison, **p ≤ 0,05.

Source: authors' elaboration

Aspects such as satisfaction with the institution, professional and vocational motivation, interpersonal relationships, study habits, academic performance, and overall well-being (linked to personal adaptation) showed significant differences between persistence and dropout (Table 6). Better adaptation reflected greater persistence among students. Similar results have been cited by other authors (Ambiel; Santos; Dalbosco, 2016; Barroso *et al.*, 2022; Casanova *et al.*, 2018a; Hakyemez; Mardikyan, 2021). Complementarily, also partially observed in this study, authors have highlighted the importance of time management to optimize the completion of academic activities (QVA-r study dimension) and the perception of friendship and cooperation among peers and professors for improving academic performance and reducing dropout (Ambiel; Santos; Dalbosco, 2016; Bardagi; Hutz, 2012). Some studies suggest greater emphasis in the literature on attributes prior to entry into higher education, while studies focusing on goals and commitments before and after university entry remain scarce (Barroso *et al.*, 2022; Casanova; Bernardo; Almeida, 2021).

Mean self-efficacy scores of dropouts were lower in all AEFS dimensions compared to those who remained enrolled. However, these differences were not statistically significant either in the overall AEFS mean score or in the factor (dimension) analysis, as shown in Table 7. Santos, Zanon, and Ilha (2019) reported that satisfaction with the academic experience is considerably predicted by self-efficacy in higher education and that self-efficacy in social interaction appears to be the most relevant facet for satisfaction with the academic experience. These results indicate that students with higher social self-efficacy tend to report greater satisfaction with their chosen program, but also that program satisfaction may largely depend on students' capacity for interaction.

Table 7 – Comparative analysis of AEFS mean scores of students who remained enrolled and dropouts

Dimensions	Variables	n	Mean	SD	t	p-value*
Academic	Persisted	331	7,74	0,68	0,636	0,525
	Dropped out	40	7,61	0,76		
Regulation of ed.	Persisted	333	7,40	0,71	1,065	0,293
	Dropped out	40	7,10	0,82		
Social interaction	Persisted	333	7,64	0,52	1,323	0,187
	Dropped out	41	7,32	0,59		
Proactive actions	Persisted	329	7,05	0,60	0,626	0,534
	Dropped out	40	6,87	0,64		
Academic management	Persisted	329	8,16	0,46	1,841	0,072
	Dropped out	41	7,59	0,63		

* p-value based on Student's t-test for two-group comparison, ** $p \leq 0,05$.

Source: authors' elaboration

In this study, the weight of higher education self-efficacy on persistence was small, aligning with the results of Fior *et al.* (2022a) and diverging from Cervero *et al.* (2021), who identified self-efficacy perception, satisfaction with program choice, low anxiety levels, and reduced emotional exhaustion as the most relevant predictors of persistence in higher education. It also diverges from the studies of Casanova *et al.* (2018b) and Martins and Santos (2019), which identified higher education self-efficacy, associated with greater use of learning strategies, as a predictor of persistence.

4.3 Predictive model of dropout

A logistic regression model was used to examine the relationship between sociodemographic variables, self-efficacy dimensions, and academic experiences with student dropout. Due to the required cross-analyses, the sample size was reduced to 319 students, of whom 241 were men and 78 were women. Regarding dropout, 282 students remained enrolled and 37 dropped out. Using the backward method (Wald statistic) for automatic variable selection, the final model was obtained and is presented in Table 8.

Table 8 – Logistic regression results with significant predictors

Independent variables	B	S.E.	Wald	Sig.	Exp(B)
Institutional AE	-1,884	0,379	24,786	0,000*	0,152
Gender	1,043	0,406	6,616	0,010*	2,838
Constant=4,880*	R ² Cox and Snell=0,097			R ² Nagelkerke=0,190	

* $p \leq 0,05$.

Source: authors' elaboration

Dropout students (dropout = 1) were considered the reference group, and gender used female as the reference category (female = 1). Based on the results in Table 8, the higher the student's score in institutional adaptation, the lower the probability of dropout ($B = -1.884$). Conversely, being female increased the likelihood of dropout compared to being male ($B = +1.043$). Approximately 18.0% of female students dropped out, while the percentage among male students was 9,5%.

In logistic regression, dropout was associated with gender, but not with self-efficacy levels, a result similar to Casanova *et al.* (2018b). However, those authors reported that male students showed higher dropout intention, whereas the opposite was observed in the present study. These findings also diverge from Fior *et al.* (2022a), who identified that being female and reporting higher self-efficacy were associated with better academic performance and, consequently, lower dropout risk. Likewise, being female and enrolled in a preferred-choice program reduced dropout likelihood. The literature emphasizes the weight of personal, psychological, academic, and career variables in dropout and suggests interventions to promote persistence. Cervero *et al.* (2021) reported that women scored higher on satisfaction with program choice, but gender was not related to dropout, differing from the present findings.

The model explained only between 9.7% (Cox and Snell R^2) and 19.0% (Nagelkerke R^2) of dropout variance, correctly classifying 89.7% of cases. It predicted with high accuracy (99.6%) the students who remained enrolled but only 13.5% of dropout cases. Therefore, for prediction purposes, the model was weak.

Institutional adaptation was a significant predictor of dropout, unlike the other adaptation dimensions. This finding complements the higher institutional adaptation scores in the QVA-r (Table 1), which confirmed students' positive perceptions of the institution. It is noteworthy that data were collected during the pandemic emergency phase in 2021, when freshmen had not yet attended in-person classes. Evaluation of institutional quality was mainly based on technological infrastructure, access to remote classes, and professors' ability to motivate students in relation to the institution.

The low impact of age on adaptation, self-efficacy, and persistence may be linked to the small variability in participants' ages ($SD = 1.4$ years) and to institutional practices such as the freshman support program implemented during the first semester and other psycho-pedagogical initiatives offered by the institution. These actions and outcomes, such as students' perception of knowledge acquisition, have been identified (Fior *et al.*, 2022a; Tinto, 2017; Casanova *et al.*, 2018a; Cervero *et al.*, 2021) as

fundamental for fostering students' commitment to their programs, recognizing curriculum relevance, developing a sense of belonging, and reducing dropout risk. These aspects, combined with academic support activities, extracurricular opportunities, and teamwork, provide meaningful career exploration experiences.

Although socioeconomic variables were not assessed in this study, attending public or private high school could indicate possible relationships with dropout, but no significant association was found. Some authors have reported higher dropout rates among students from less privileged sociocultural backgrounds, who often experience limited educational opportunities, poorer study habits, and weaker critical thinking skills, factors that may negatively affect motivation and academic success, increasing dropout risk (Casanova *et al.*, 2018a). When students fail to advance in their programs and drop out, their scientific training or entry into the labor market, among other achievements associated with success in higher education, becomes hindered, perpetuating the cycle of financial scarcity.

5 FINAL CONSIDERATIONS

This study provides evidence that academic adaptation may be a decisive factor for student persistence or dropout in higher education. The findings highlight the relevance of institutional actions directed toward students' personal and social well-being, motivational support for studying, routine organization, career planning, and provision of adequate infrastructure. Since dropouts exhibited lower self-efficacy beliefs in higher education, it appears promising to invest in interventions that expose students to positive academic experiences, understood as opportunities for developing self-efficacy (as suggested by Bandura, 1986), combined with workshops aimed at strengthening such beliefs.

The study also identified progress in the development of tools designed to assist in detecting students at risk of dropout in higher education (Ambiel, 2015; Lin, 2015). It is essential to invest in validation and consolidation of these tools, so that systematic practices of continuous support for students can be adopted (Casanova, 2020).

Finally, dropout cannot be attributed solely to the student. The results of this research may guide higher education administrators in evaluating the causes of dropout and, subsequently, contribute to the design of preventive and/or intervention programs.

Regarding limitations, only self-report instruments were used to investigate the study variables; the sample was composed of students from a single institution; and data collection was carried out only once, during the period of social isolation caused by SARS-CoV-2. Therefore, it is recommended that future studies monitor the development of these variables over time, comparing results across different phases (during and after the pandemic), and analyze the predictive role of academic adaptation and self-efficacy in dropout through regression and structural equation modeling. Such approaches would enable a more precise assessment of the weight and influence of these variables on the reasons for dropout.

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Authors' contributions

All authors reviewed and edited the final version of the manuscript. All authors approved the publication of the final version of this manuscript.

Conflict of Interest Statement

The authors declare no conflict of interest regarding the article "Influence of adaptation and self-efficacy on dropout among higher education students".

Data Availability

All underlying materials that support this study are included in the manuscript.

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